



# Application Alley

## Electronics - Reed Sensor

*Hotel Security Card Readers Use Reed Sensors*

## Introduction

Card readers have come under increased use in hotels and a host of other card detection activities. With the dramatic increase in use, the quality and reliability have become big factors in shaping the technology used for card detection. Furthermore, power requirements can play an important role as well. Designers have chosen reed sensors to improve the quality, reliability and reduce power usage.

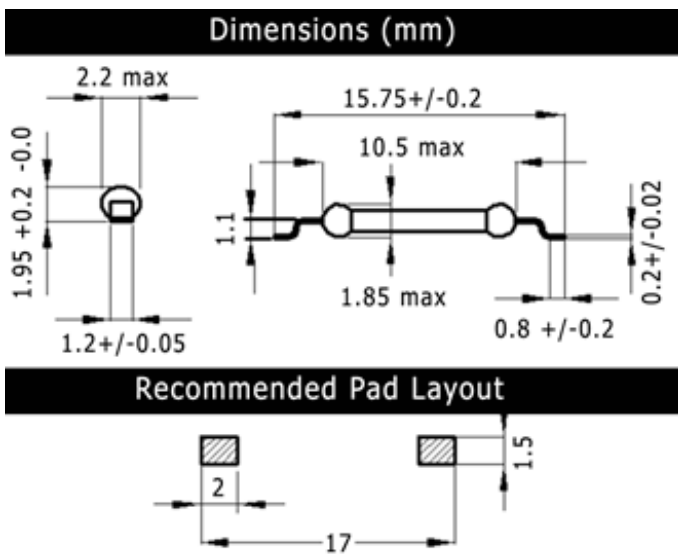


Figure 1. MK23 Sensor physical layout

## Features

- Magnet and Reed Sensor are isolated and have no physical contact by typically having the magnet mounted to a mechanical arm, and the Reed Sensor mounted and positioned usually on a PCB to accurately pick up the movement of the magnetic field from the magnet on the arm.
- The reed switch used in the Reed Sensor is hermetically sealed and is therefore not sensitive to wet, dirty, dusty environments.
- The magnet is not affected by its environment
- Tens of millions of reliable operations.
- Surface mount and through hole packages avail-

able

- Contacts dynamically tested

## Applications

- Ideal for sensing the hotel card readers when a card is inserted into the slot
- Ideal for applications using card readers in a host of different applications

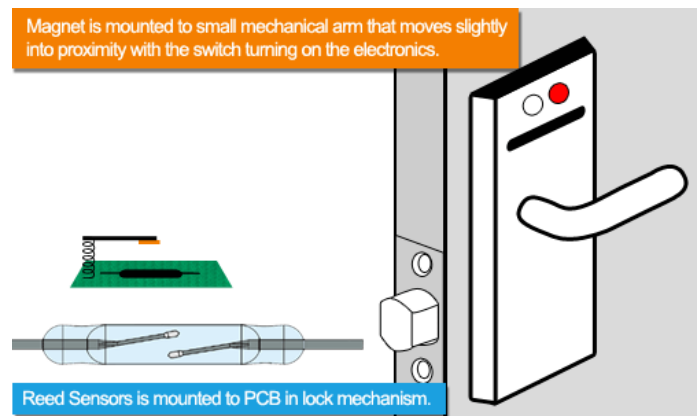


Figure 2. Reed Switch Sensor draws no power in its normally open contact state as shown.

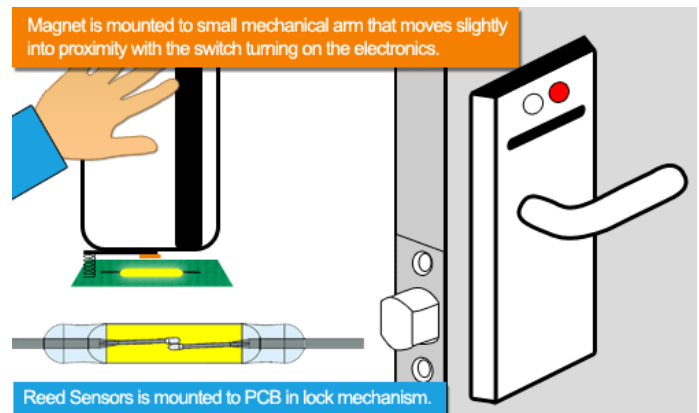


Figure 3. When card is inserted into lock mechanism it moves a small mechanical arm with attached magnet into proximity with the reed switch closing the contacts and activating the lock electronics. When the card is removed the reed switch contact reopen.

## Reed Sensors Solve the Reliability and Battery Drainage Problem for Hotel Key Cards

Most hotels have converted over to key cards with a programmed magnetic strip on its surface. The question is when and how to activate the magnetic strip reader? Using a simple mechanical switch to turn on the reader has been fraught with quality problems. Most times the mechanical switches are not sealed and are therefore subject to moisture, dirt and grime. Any of these substances landing on the contact area will corrode the contacts or prevent proper switching. Using an electronic opto-isolator is very reliability but requires power all the time. If the electronics in the door is battery operated, which is often the case, the battery will be used up much quicker. For these reasons, reed sensors have now been chosen as the design-in choice.

A tiny magnet typically 1 mm in diameter and 1 mm long is mounted to a small mechanical arm that moves slightly when a card is placed in the card slot. This movement is enough to bring the magnet's magnetic field near enough to the reed sensor, which is sitting on a PCB, to activate it. Once activated the reed sensor will turn on the electronics, which in turn activates the magnetic strip reader. The strip reader that reads the magnetic strip on the card and if it is correctly designated, the door lock will deactivate allowing the door to be opened. Once this occurs, the electronics with shut down again conserving battery power. The reed sensor will sit in its inactivated position and will draw zero power. The only time it will draw power is when it is activated.

### Specifications (@ 20°C) MK23 Series

	Min	Max	Units
<b>Operate Specifications</b>			
Must close distance	5	25	mm
Must open distance	5	25	mm
Hysteresis	Typical 50%		
<b>Load characteristics</b>			
Switching voltage		200	V
Switching current		0.5	Amps
Carry current		1.5	Amps
Contact rating		20	Watts
Static contact resistance		150	mΩ
Dynamic contact resistance	200		mΩ
Breakdown voltage	320		V
Operate time		0.5	msec
Release time		0.1	msec
Operate temp	-20	130	°C
Storage temp	-35	130	°C

## Dimensions (mm)

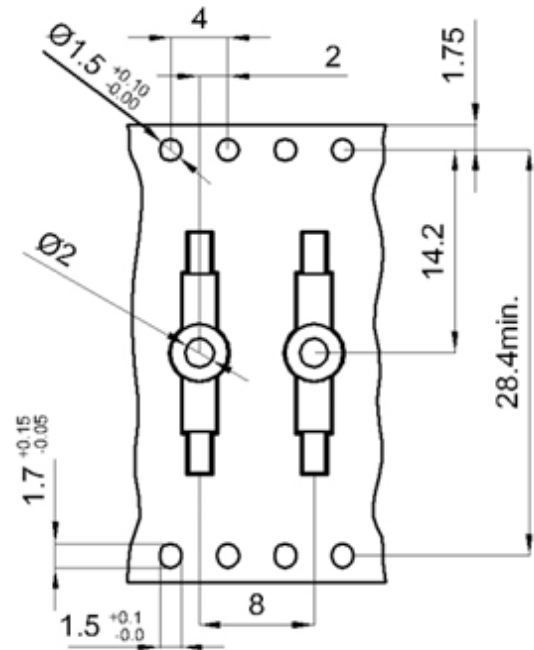










Figure 4. MK23 Tape & Reel





#### Surface Mount Sensor Series

Series	Dimensions			Illustration
		mm	inches	
MK15	W	2.5	0.098	
	H	2.5	0.098	
	L	19.50	0.768	
MK16	W	2.3	0.091	
	H	2.3	0.091	
	L	15.60	0.614	
MK17	W	2.1	0.083	
	H	2.1	0.083	
	L	9.61	0.378	
MK22	W	2.7	1.060	
	H	2.3	0.091	
	L	15.60	0.614	
MK23-35	W	2.2	0.087	
	H	1.95	0.077	
	L	15.75	0.620	
MK23-66	W	2.2	0.087	
	H	2.7	1.060	
	L	19.60	0.772	
MK23-87	W	2.0	0.079	
	H	2.1	0.083	
	L	15.60	0.614	
MK23-90	W	2.54	0.100	
	H	3.05	0.120	
	L	24.9	0.980	

The reed sensor is an excellent choice because it can operate reliably from -50°C to 150°C and represents an economical way to carry out the sensing function. Because Standex Electronics's sensors use hermeti-

cally sealed reed switches that are further packaged in strong high strength plastic, they can be subject to rough treatment and environmental concerns such as grit, water, and moisture without any loss of reliability.

#### Through Hole Sensor Series

Series	Dimensions			Illustration
		mm	inches	
MK06-4	W	3.3	0.130	
	H	3.3	0.130	
	L	12.06	0.475	
MK06-5	W	2.8	0.110	
	H	3.2	0.126	
	L	14.30	0.563	
MK06-6	W	3.3	0.130	
	H	4.2	0.165	
	L	17.24	0.679	
MK06-7	W	3.3	0.130	
	H	4.2	0.165	
	L	19.78	0.779	

Standex Electronics's sensors are packaged for surface mounting as well as through hole mounting.

Find out more about our ability to propel your business with our products by visiting [www.standexelectronics.com](http://www.standexelectronics.com) or by giving us a [hello@standexelectronics.com](mailto:hello@standexelectronics.com) today! One of our engineers or solution selling sales leaders will listen to you immediately.

## About Standex Electronics

Standex Electronics is a worldwide market leader in the design, engineering, and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions.

Our magnetics offerings include planar, current sense, and conventional low- and high-frequency transformers and inductors. Reed switch-based solutions include Meder, Kent, and KOFU brand reed switches, as well as a complete portfolio of reed relays, and a comprehensive array of fluid level, proximity, motion, water flow, HVAC condensate, hydraulic pressure differential, capacitive, conductive and inductive sensors.

We offer engineered product solutions for a broad range of product applications in the transportation, automotive, medical, test and measurement, military and aerospace, aviation, HVAC, appliance, security and safety, and general power and industrial markets.

Standex Electronics has a commitment to absolute customer satisfaction through a partner, solve, and deliver approach. With a global organization that offers sales support, engineering capabilities, and technical resources worldwide – we implement customer driven innovation that puts the customer first.

For more information on Standex Electronics, visit us on the web at [standexelectronics.com](http://standexelectronics.com).

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