



# Smartfob Receiver

INSTALLATION MANUAL

(SFR-200 MN: SFR2RXB)



FCC- and IC-compliant  
receiver

July 2008



*Cutting edge simplicity*



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# Introduction

The SmartFob SFR-200 receiver (replaces the SFR-100) detects radio frequency (RF) signals from the Cansec SmartFob (SFT-200) transmitter. The receiver comes with two sets of onboard relay contacts, which may be activated via a DIP switch. A Cansec SmartFob transmitter will cause the relay contacts to toggle on and off for approximately one second. A typical use for these relay contacts is to turn on a indicator light to let users know when data from SmartFob transmitters is received and decoded correctly. After the receiver decodes the RF signal from the transmitter, it will output Wiegand data to an access controller. The Cansec SFT-200 transmitter has two buttons:

- **Button I**
- **Button II**

The SFR-200 receiver may be configured via a DIP switch to operate in:

- **Common Mode** - data from Button I and II is sent via AD0 and AD1
- **Split Mode** - data from Button I is sent via AD0 and AD1, and data from Button II is sent via BD0 and BD1

A typical example of the split mode of operation is IN / OUT functionality for two-door garage applications.



## Features:

- increased signal reception range
- better noise filtering (at 315 MHz)
- standard 26-bit or Cansec 37-bit Wiegand output to an access controller
- interchangeable with existing SFR100 receivers
- audible indicators help with troubleshooting
- RSSI signal indicates RF interference to aid in proper receiver placement
- vertical antenna supplied (dipole antenna available)

# Specifications

**Power Requirements:** .....12 VDC, 100 mA

**Wiegand Cable:** ..... 22 AWG, 6 conductors (AD0,AD1 & BD0,BD1)  
or 4 conductor (AD0 & AD1), stranded,  
overall shield; maximum 152 m (500 ft) to controller

**Input Frequencies:**

Model SFR2RXB..... 418 MHz

**Output Formats:** .....26-bit standard Wiegand;  
37-bit Cansec Wiegand

**Transmission Reception Range:**..... 45 m (150 ft)

**Temperature Range:** .....-40°C to 70°C (-40°F to 158°F)

**Dimensions:** ..... 152 mm (w) x 114 mm (h) x 46 mm (d)  
[6 in (w) x 4.4 in (h) x 1.8 in (d)]

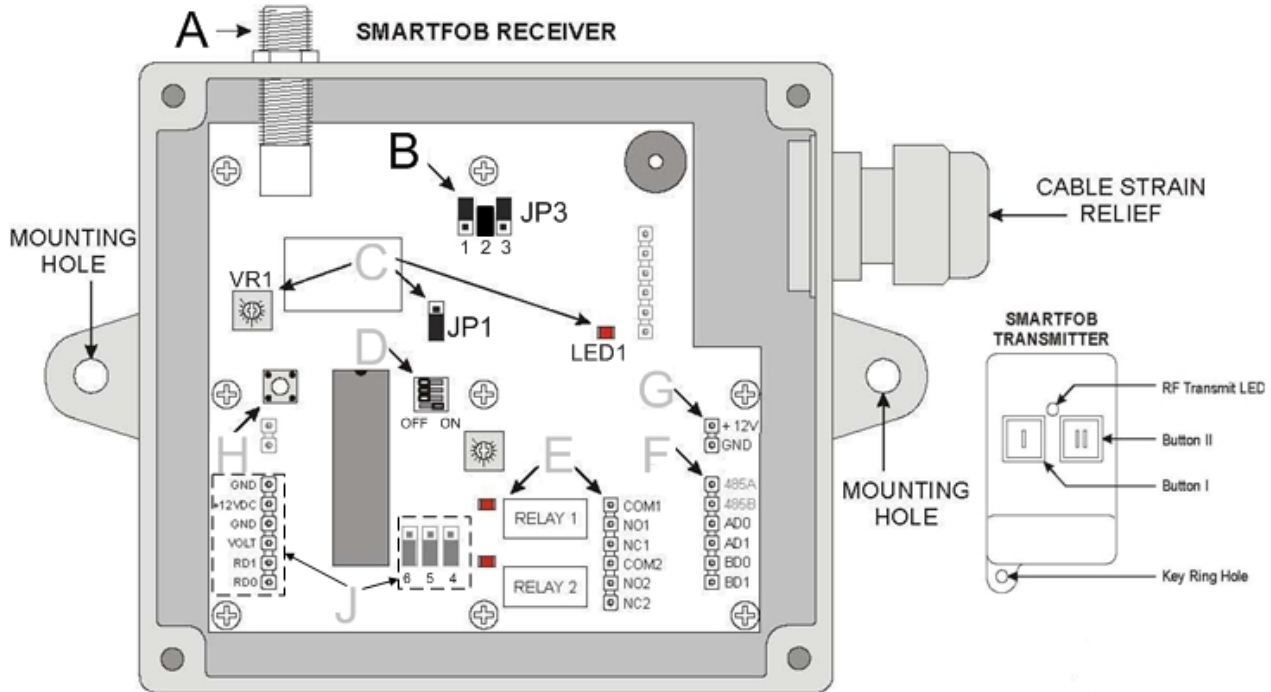
**Weight:** .....310 g (10.8 oz)

**Installation Environment:** ..... indoor/outdoor

*\*Specifications subject to change without notice*

# Configuration & Wiring

## ANTENNA, JP3 AND RELAYS 1&2



### A: ANTENNA CONNECTOR

“F” Type, 3/8” - 32

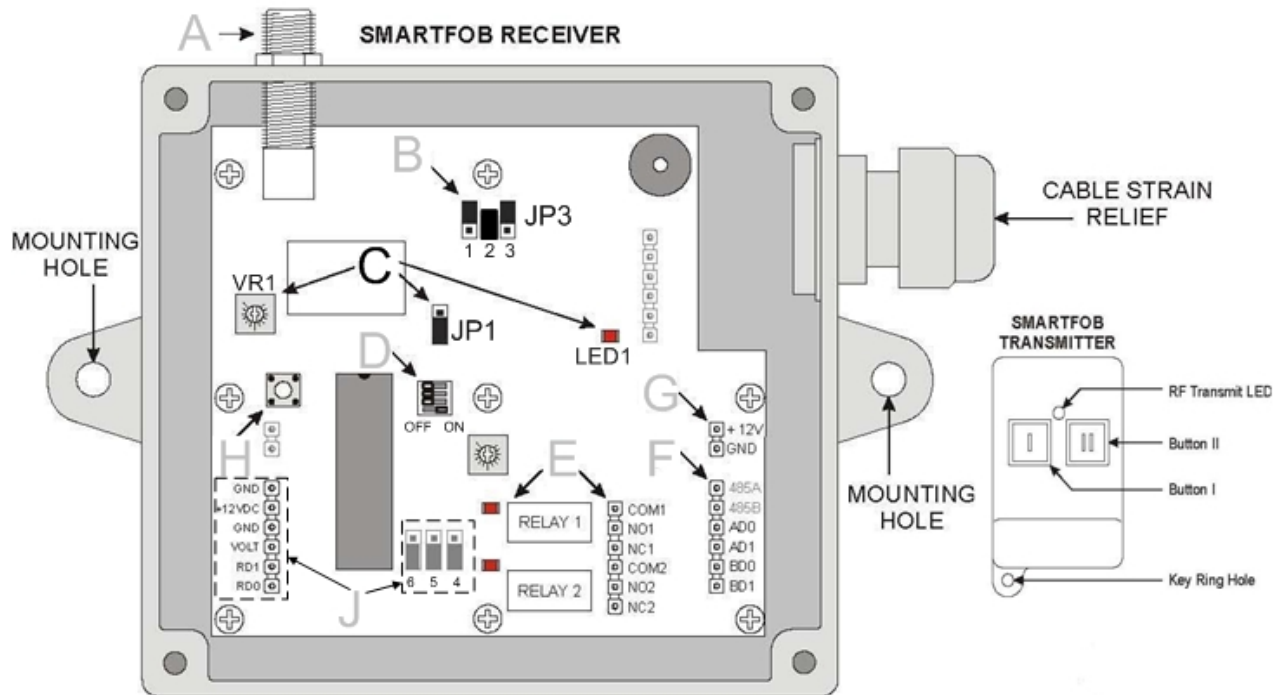
### B: JP3




[ Default position: Jumper 1 & 3 OUT (pins not shorted); jumper 2 IN (pins shorted) ]


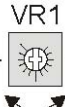
<b>JUMPER 1</b>	OUT = On-board Beeper disabled IN = On-board Beeper enabled (sounds when valid data is received)
<b>JUMPER 2</b>	OUT = Accepts SF200 Transmitters only (binary stream support) IN = Accepts SFR100 or SFR200 transmitters (SF100 Mode)
<b>JUMPER 3</b>	N/A = Reserved for future use.


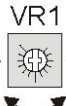
## G JP1 AND LED1



### C: RECEIVED SIGNAL STRENGTH INDICATION (RSSI) ADJUSTMENT


 (Top 2 pins) = RSSI is **OFF** (default position maximum sensitivity and range).


 (Bottom 2 pins) = RSSI is **ON**. Carefully adjust  range. For noise rejection set VR1 just below the point that causes LED1 to turn off.

**NOTE:**  will be constantly flashing if unit is at maximum sensitivity or if  is set to Maximum Range.

It is best to operate the SFR-200 is with the RSSI jumper set to OFF (receiver is set to its maximum receive range).

## HOW TO REDUCE RANGE

To reduce the receive range, set the RSSI jumper to **ON** and adjust **VR1** to the required reduced range. The procedure is as follows:

1. Adjust VR1 position to the point where the LED1 just turns off.

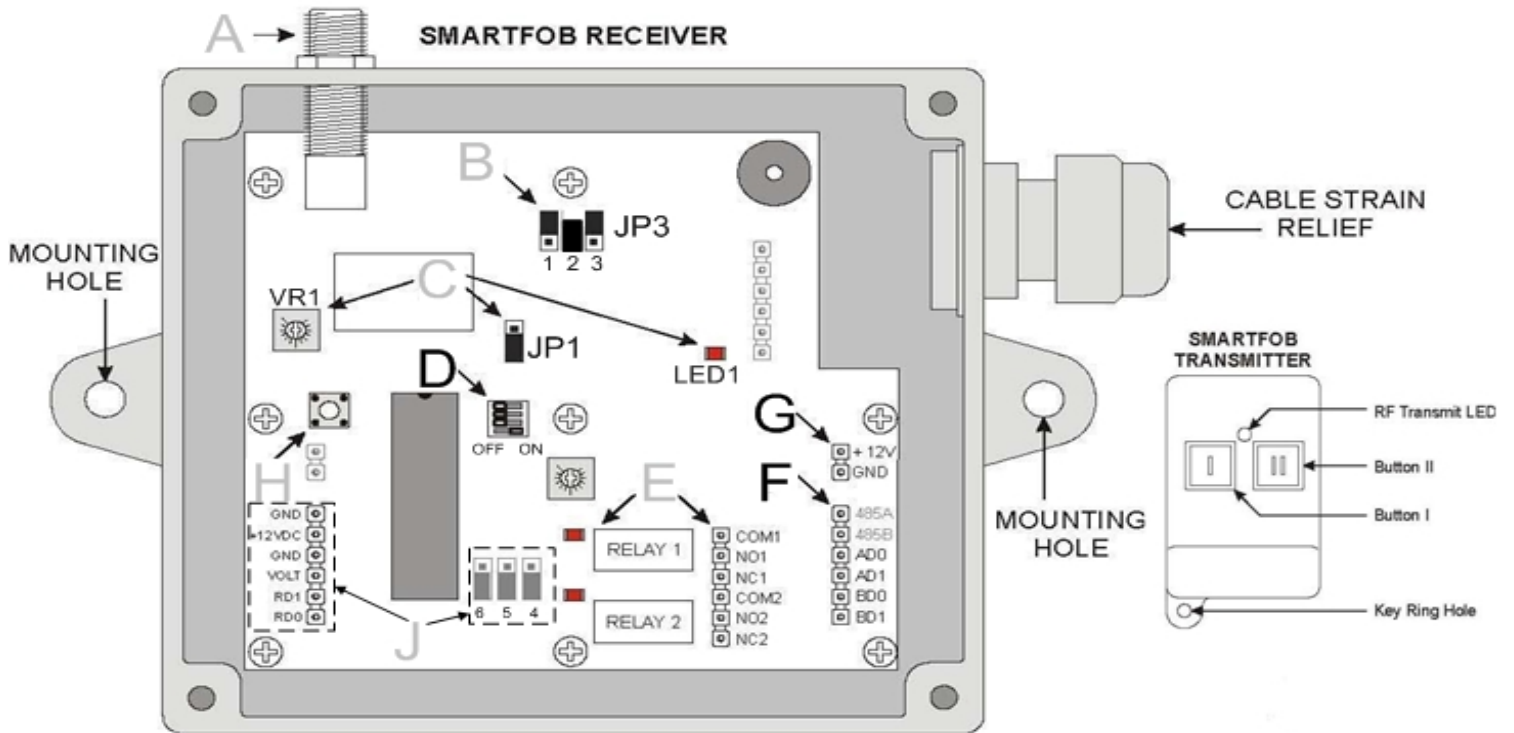
**NOTE:** To aid in this adjustment the SFR-200 Receiver's audible beep can be used. Each time a Cansec SmartFob transmitter is decoded correctly the SFR-200 receiver will beep.

2. Adjust VR1 toward the (-) or reduced range.
3. Back away from the receiver and press the SmartFob transmitter. If no audible beep is heard, the range has been exceeded.
4. Repeat this procedure until the required range is found.

**NOTE:** It is important to test more than one SmartFob transmitter to verify this reduced range. It is also important to test the area of reception from all different angles to the SFR-200 receiver.



**G** DIP SWITCH S1, WIEGAND OUTPUT AND POWER INPUT



## D: DIP SWITCH

OFF ← → ON

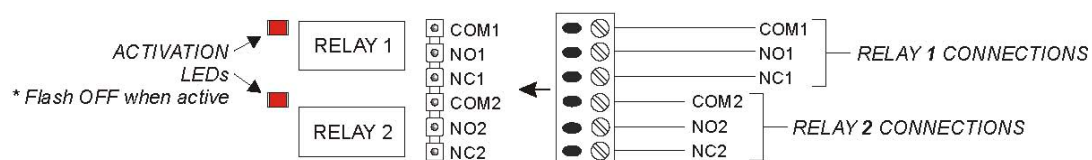


= Default position: Switch 1, 2, and 3 OFF; switch 4 ON

Switch 1	OFF = Common Mode. <b>Buttons I and II</b> on the SmartFob transmitter will send data via AD0 and AD1 and activate relay 1 <i>if relay activation is on</i>
	ON = Split Mode. <b>Button I</b> will send data via AD0 and AD1 and activate relay 1* <b>Button II</b> will send data via BD0 and BD1 and activate relay 2*
Switch 2	OFF = A single valid data bundle is received and then Wiegand data is sent to the access controller. <i>See the <b>DIP Switch 2</b> note below.</i>
	ON = Receiver will read and validate and compare two successive data bundles. If they are the same, then Wiegand data is sent to the access controller. <i>See the <b>DIP Switch 2</b> note below.</i>
Switch 3	OFF = 37-bit Cansec propriety Wiegand.
	ON = 26-bit standard Wiegand.
Switch 4	OFF = Relay activation off.
	ON = Relay activation on.

**DIP Switch 2:** In extremely noisy areas, some random Wiegand data may pass the decoding tests and produce an invalid number to the access control panel. Enabling DIP switch 2 will eliminate the problem.

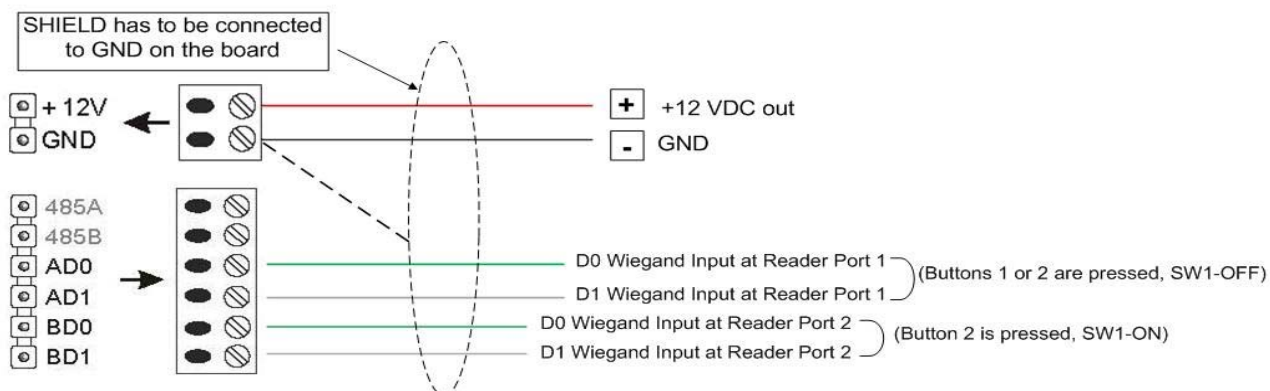
## E: RELAY OUTPUTS 1 AND 2



See section (D) Dip Switch for information regarding relay operation.

## F: WIEGAND OUTPUT

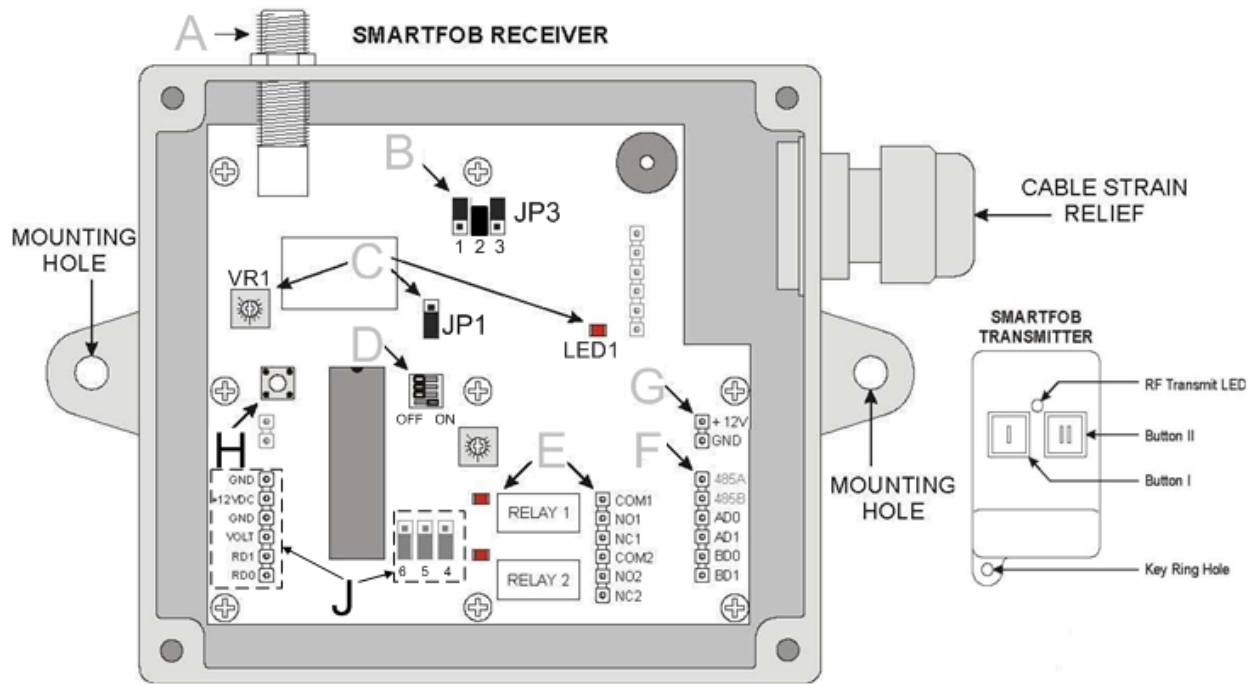
## G: POWER INPUT



See section (D) Dip Switch for information on split and common Wiegand data output modes.

**NOTE:** Ensure a common ground (GND) connection is attached to the receiving access controller for proper Wiegand signal detection.

## **G** RESET BUTTON, AUX OUTPUTS & JP4, JP5, JP6



### J: JP4, JP5 and JP6

These jumpers are reserved for future use and factory testing purposes. Please **DO NOT** change the factory setup.

### J: AUX OUTPUTS

These outputs are not active, except **GND** and **VOLT** that can be used for RSSI testing. See section **Measuring RSSI Voltage** for more information.

### H: RESET BUTTON

Press the reset button  after the **DIP switch** configuration is changed for the changes to take effect.

# Measuring RSSI Voltage

To measure the receiver module RSSI voltage:

1. Set a voltmeter to DC volts and 5 volt range
2. Connect the voltmeter between VOLT (+) lead and GND (-) lead.

This voltage measurement indicates direct ambient RF noise; it is not affected by the VR1 RSSI control circuitry. A lower voltage means less ambient RF noise. A higher voltage means more ambient RF noise. This directly affects reception distance and quality.

## RF NOISE

RF noise reception affects range and signal readability, the lower the RSSI voltage the better quality of signal is being received. The SFR-200 receiver module has more filtering and better range, but it has its limitations in certain environments.

Typical Office Area	Average RSSI Voltage
no antenna	0.4V
with antenna	0.55V to 0.6V

A reading in the 1V range means that there is a high level of ambient RF noise at the receiver. You may have to move the receiver away from the source of the noise.

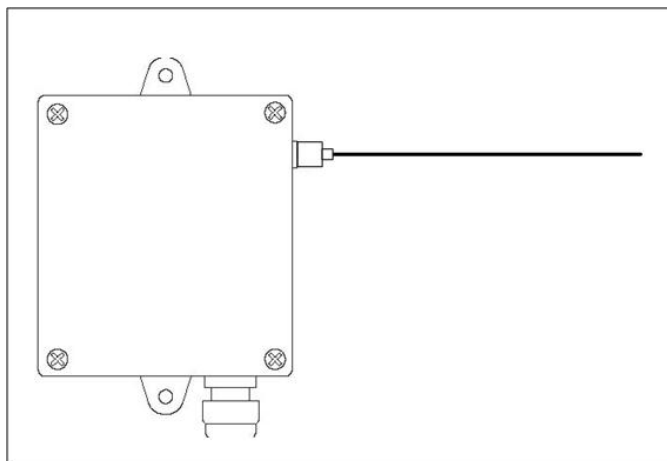
When measuring the RSSI voltage, if you activate a SmartFob transmitter by pressing one of the buttons, the voltage will jump to the 1V range. This is an indicator of the strength of the RF transmission signal relative to the ambient RF noise.

## DIPOLE VS VERTICAL ANTENNAE

Dipole antennae should be used to improve range and signal quality. This is because vertical antennae receive RF signals from all directions, while dipole antennae receive most RF signals from the front and back, eliminating noise from the sides of the antenna.

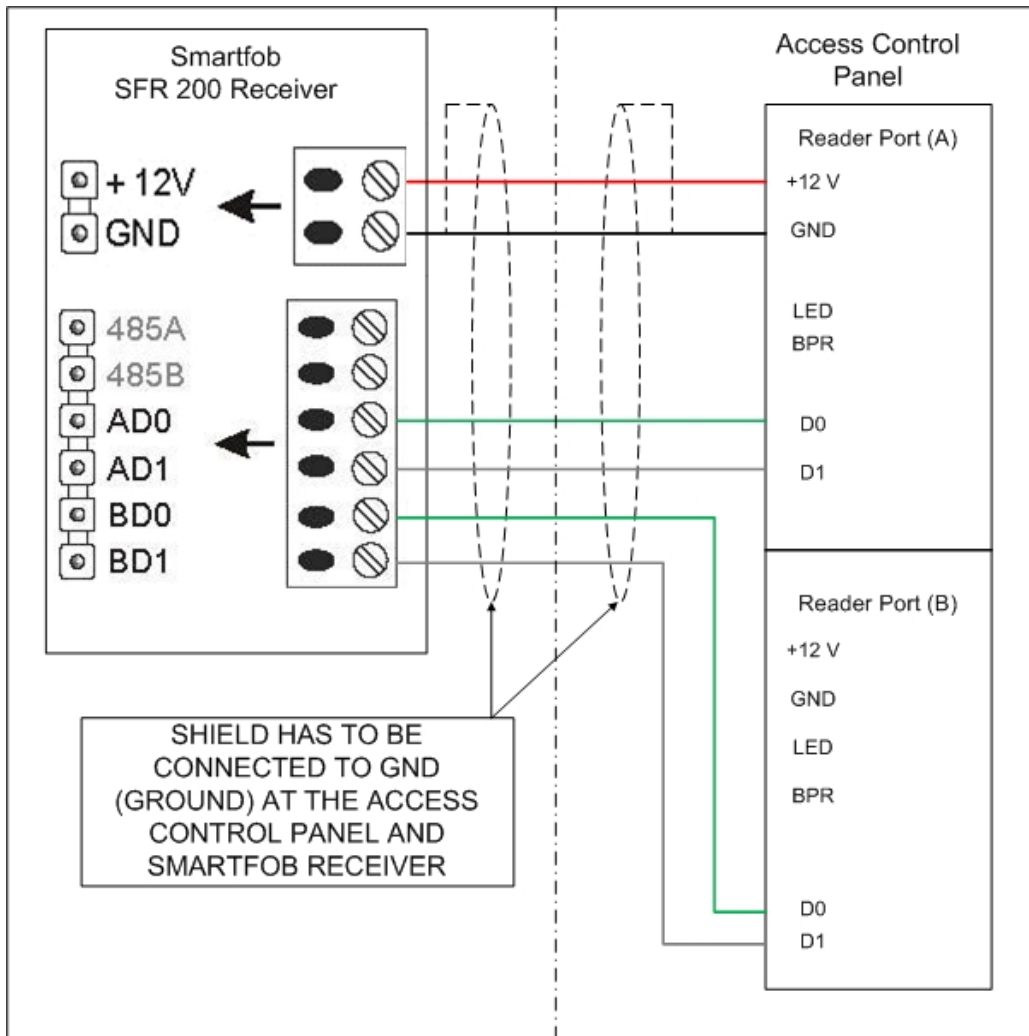
## Mounting Recommendations

1. Mount the receiver as shown at the bottom. This will put the vertical antenna in a horizontal position, which achieves the best range for the Cansec SmartFob transmitter.
2. Mount the receiver in a low electrical interference location.
3. Mount the receiver in a location which optimizes a line of sight from the transmitter.
4. **Vertical Antenna:** When using a vertical antenna, mount the SFR-200 receiver housing about 9 in (25 cm) away from the wall surface.
5. **Dipole Antenna:** The dipole antenna comes with an L-bracket for proper antenna mounting. Connect a short piece (less than 25 ft or 8 m) of 75 ohm coax (CATV cable and connectors) to the antenna and place the receiver in a suitable location.

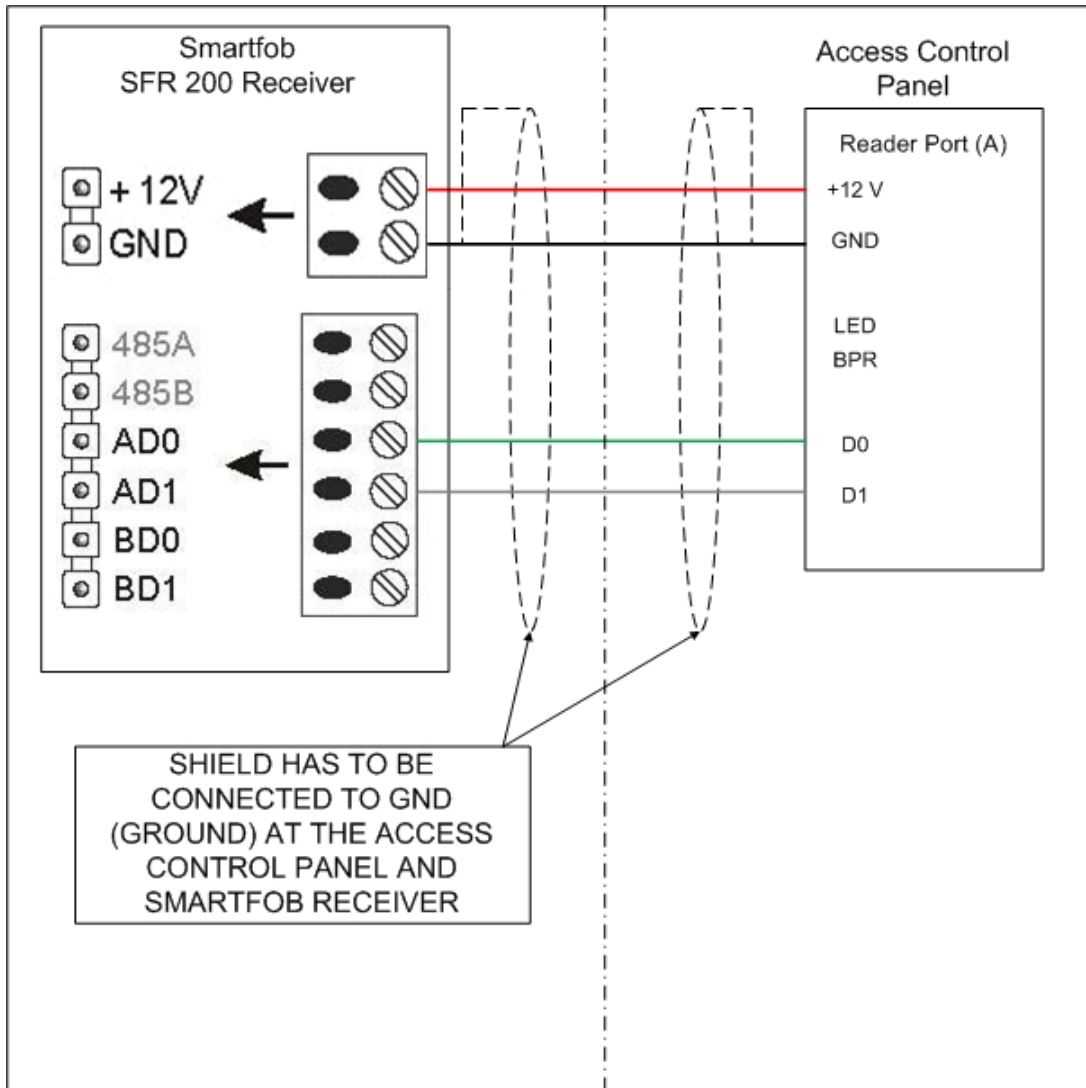


# Wiring Sample

## SPLIT MODE



## COMMON MODE





# FCC and IC Compliance Statement



FCC- and IC-  
compliant receiver

## INFORMATION TO USERS (FCC 15.21 & 15.105)

### **For Class B Unintentional Radiators:**

This equipment has been tested and found to comply with the limits for a Class B digital devices, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## WARNING TO USERS (FCC 15.21 & 15.105)

### **Warning:**

Changes or modifications not expressly approved by Cansec Sytems Ltd. could void the user's authority to operate the equipment

## INDUSTRY CANADA COMPLIANCE STATEMENT:

This Class A digital apparatus complies with Canadian ICES-003 / Cet appareil numérique de la classe A est conform à la norme NMB-003 du Canada.