Szok Energy and Communication Co.,Ltd

www.sf-tek.com.tw
+886-2-26962500
Rm. 1, 17F, No. 104, Sec., 1,
Xintai 5th Rd., Xizhi Dist.,
New Taipei City, 22102, Taiwan

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SRF-4160 UHF Radio Frequency Identification (RFID) Module User's Manual

Overview：

As a long-range radio frequency identification (RFID) reader, the SRF-4160 is a 900MHz (UHF band) UHF RFID reader operable at various operating bands specified by individual countries. It also complies with all standard protocols defined in ISO18000-6C (EPC GEN2)。

Features：
- 25.37 dBm RF module
- Built-in automatic fine-tuning design can be matched to a variety of different environmental changes, for achieve the best performance applications
- Wiegand signal output, suitable for access control related
- Including RS485 communication interface can remote and back-end equipment to transfer code and control code.
- Ideal sensing range over 8 meters (with 8dBi Antenna)
- Special energy-saving design reduce power consumption
- Avoid the interference of other radio frequencies with the look-up table frequency-hopping spread spectrum (FHSS)
- Pass R&D patent for EMI reduction in many countries
- Pass FCC certification
- Support external sensors and controllers
- API under Windows operating system for shorten application development time
- The complete RS485 instruction format facilitates the expansion of device functional integrity

Recommended uses：
- Driveway control and management / personnel access control and management of residential buildings,buildings,and communities
- Industrial relate management and control
- Elevator control and management
- Logistics related management
- Asset management
- Security monitoring

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Certification

- FCC ID : 2ADGD-SRF4160US

Federal Communications Commission (FCC) Statement
15.21
You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)
This equipment has been tested and found to comply with the limits for a Class B digital device, 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 instructions, 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 or 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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1) this device may not cause harmful interference and
2) this device must accept any interference received, including interference that may cause undesired operation of the device.

RF exposure:
To comply with the FCC RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC RF Radiation Exposure Statement:
1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

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End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 centimeter may be maintained between the antenna and users. The final end product must be labeled in visible area with the following:
"Contains FCC ID: 2ADGD-SRF4160US"

This device is intended only for OEM integrators under the following conditions:

The UHF RFID Reader may transmit simultaneously with other collocated radio transmitters within a host device, provided the following conditions are met:

1. Each collocated radio transmitter has been certified by FCC for mobile application.

2. At least 20 cm separation distance between the antennas of the collocated transmitters and the user's body must be maintained at all times.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions cannot be met (for example co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization. As long as a condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.)

Manual Information to the End user

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Antenna Restriction

The antenna is designed as permanent attached and no consideration of replacement.
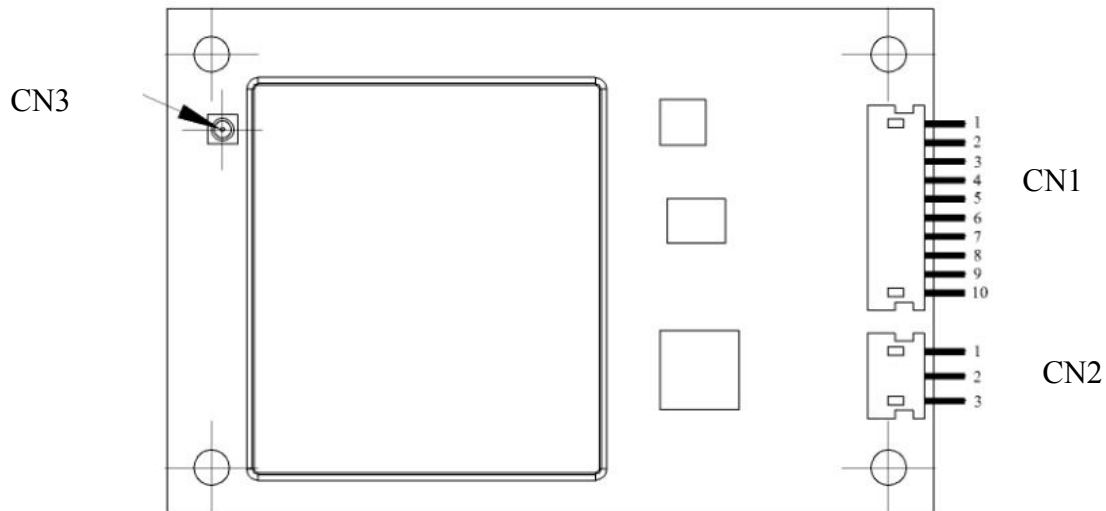
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Product specifications :

Input voltage	DC12 V
Average operating current	0.3A
Maximum moment current	1A
Output interface	Wiegnad / RS485
Operating band	902-928MHz
Emission power	25.37 dBm
Antenna Gain	10 dBi @ SRF-D390
	4dBi@ SRF-E190/SRF-E290
Modulation scheme	PR-ASK, ASK
Current	<1A (Max)
Protocol	EPC Gen2 (ISO 18000-6C)
Receiving sensitivity	-85 dBm
Sensing range	>8M @ 8dBi Antenna
Operating temperature	-20℃ ~ +55 ℃
Storage temperature	-20℃ ~ +85℃
Humidity	5-90%
Dimension	67.3 X 44.3 X 4.65 mm

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Output connector description：

CN1：Output pin assignment (JST/1.5mm/10pin)

PIN	Definition	Function
1	+12V	Input Current
2	GND	
3	RS485+	RS485 Signal
4	RS485-	
5	GND	Level Reference Point
6	GND	
7	Data 1	Wiegand Signal
8	Data 0	
9	Digital IN	External control signal input,Active Low
10	Digital OUT	External signal output ,for RS485 communication only

CN2： Two-color LED (JST/1.5mm/3 pin)

PIN	Definition	Function
1	Data LED	Green light
2	Common Anode	5V Output
3	Power Led	Red light

CN3： Antenna Connector (IPEX 1)

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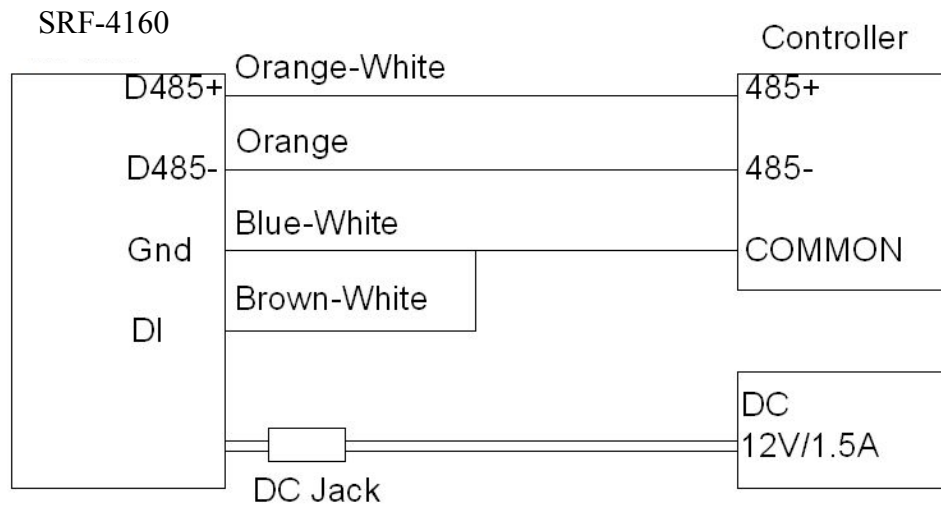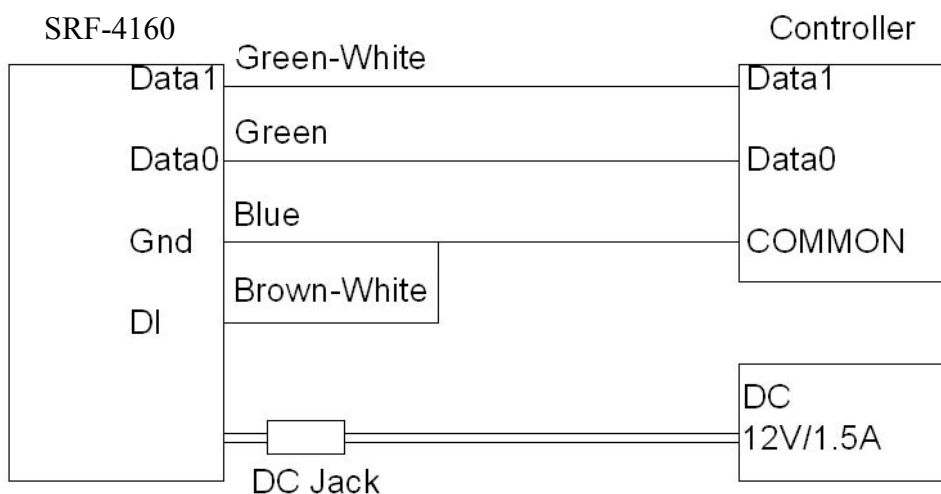
1. RS485 Communication Interface
1.1 Connect with the computer via RS485 to update the firmware of the RFID reader
1.2 Connect with access controller with RS485 and control it(two-way operation)
1.3 Connect and communicate with and control equipment with RS485
1.4   If DI is not in use, please be sure to connect to the GND of the system

SRF-4160

Controller

D485+ Orange-White 485+
D485- Orange 485-
Gnd Blue-White COMMON
DI Brown-White

DC Jack DC 12V/1.5A

2. Wiegand communication interface
2.1 Connect with access controller using Wiegand interface (one-way operation).
2.2 Built-in Wiegand output standard Wiegand 34 and capture the TID code from bit 1 to bit 32
2.3 The other Wiegand format settings can be changed through the associated software
2.4 If DI is not in use, please be sure to connect to the GND of the system

SRF-4160

Controller

Data1 Green-White Data1
Data0 Green Data0
Gnd Blue COMMON
DI Brown-White

DC Jack DC 12V/1.5A

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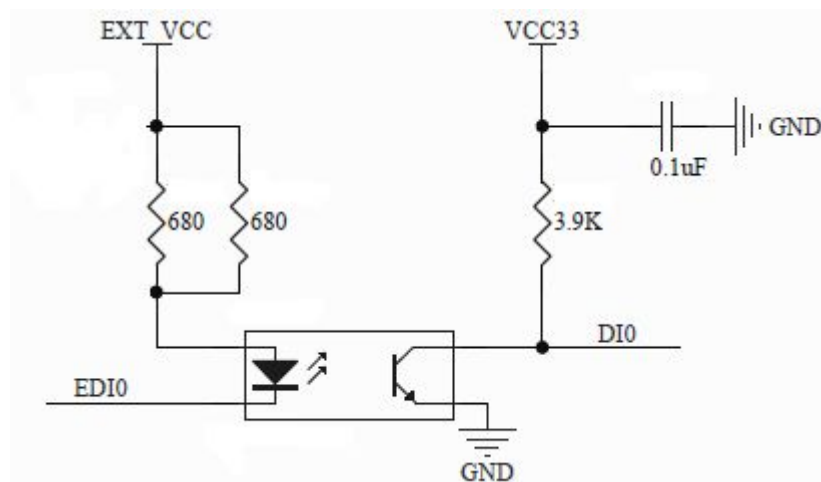
3.   DI (external control signal input)
3.1 Signal level defining: High level(H):3.3V/Low level(L) :0V(GND signal)
3.2 When the external control signal input is at high level and the SRF-D190 is in the standby mode ,the SRF-4160 will not output any identification code
3.3 When the external control signal input is at low level and the SRF-D190 is in the working mode,the SRF-D190 will output the identification code on the tag to the back-end equipment.
3.4 If DI is not in use, the DI pin must to connect to low potential
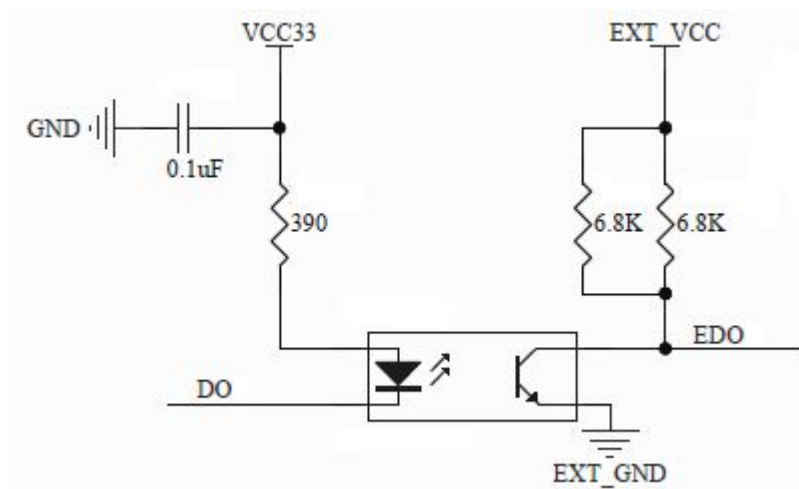3.5 Isolation is recommended to protect the circuit

4.   DO (RFID reader control signal output)
4.1 This function only with the RS485 communication interface will have action
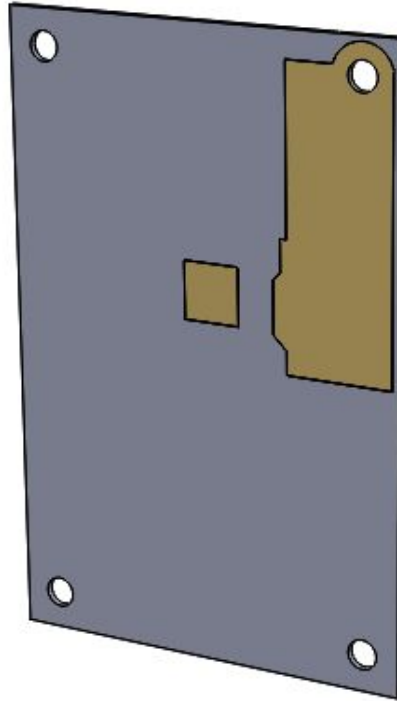4.2 Wiegand communication interface will not output any signal
4.3 Isolation is recommended to protect the circuit

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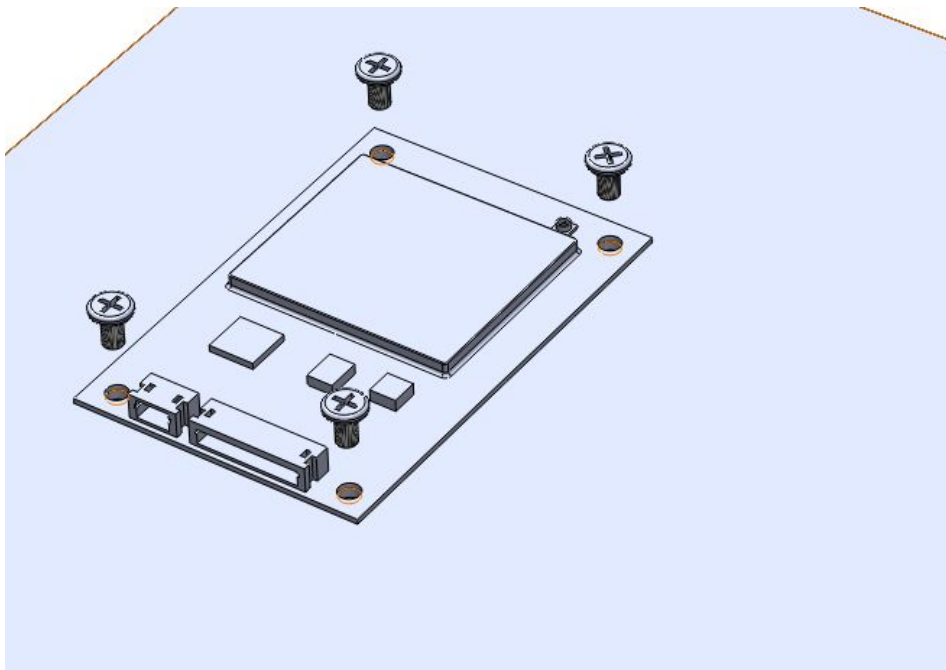*Innovation, The endless imagination*

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Installation Guide

1. In the bottom of the module exposed copper, coated with thermal paste

2. Fix the mould board on the sheet metal with M3x5mm screws. The larger sheet metal, the better auxiliary effect for cooling.

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Dimension：