G-NiceRF SK509

G-NiceRF SK509 4-Channel 433MHz Bidirectional Wireless Remote Control Switch Module User Manual

1. Introduction

The G-NiceRF SK509 is an industrial-grade, four-channel wireless switch control module designed for bidirectional communication. It facilitates the remote control of various systems, offering up to four signal inputs and four control outputs. This module is ideal for replacing wired connections with wireless solutions, significantly reducing installation complexity and time. Its robust design ensures reliable performance in diverse applications, including garden water systems and other industrial control scenarios.

Figure 1: Overview of the G-NiceRF SK509 Wireless Control Module with its antenna connected.

2. Features

- **Extended Range:** Operates effectively up to 8 kilometers (approximately 5 miles) in open areas.

- **Multiple Channels:** Offers 16 selectable channels for flexible operation and interference avoidance.
- **Configurable Parameters:** Module parameters can be set wirelessly via PC software, UART commands, or a dedicated remote controller (SK509-S).
- **Operational Modes:** Supports both Real-time and Timing operational modes.
- **Modulation:** Utilizes GFSK modulation for reliable data transmission.
- **Automatic Antenna Matching:** Simplifies antenna setup and ensures optimal performance.
- **Bidirectional Control:** Enables two-way communication for comprehensive control and feedback.
- **High Sensitivity:** Receiver sensitivity up to -121 dB ensures robust signal reception.
- **Output Power:** Maximum output power of 5 Watts.
- **Wide Voltage Range:** Operates on a working voltage of 9V to 30V.
- **Broad Temperature Range:** Functions reliably in temperatures from -40°C to +85°C.

3. Package Contents

Upon unpacking, please verify that all items listed below are present and in good condition:

- SK509 433MHz Wireless Control Module: 2 units
- SW433-XP1M Antenna: 2 units

4. Setup and Installation

4.1 Physical Installation

Mount the SK509 module in a secure location, ensuring it is protected from direct weather exposure unless housed in an appropriate enclosure. For optimal wireless performance, position the module and its antenna away from large metal objects or other sources of electromagnetic interference.

4.2 Antenna Connection

Carefully connect the provided SW433-XP1M antenna to the antenna port on the SK509 module. Ensure the connection is finger-tight to maintain good signal integrity.

4.3 Wiring Connections

The SK509 module features terminal blocks for power input, signal inputs, and control outputs. Refer to Figure 2 and Figure 3 for the layout and pin assignments.

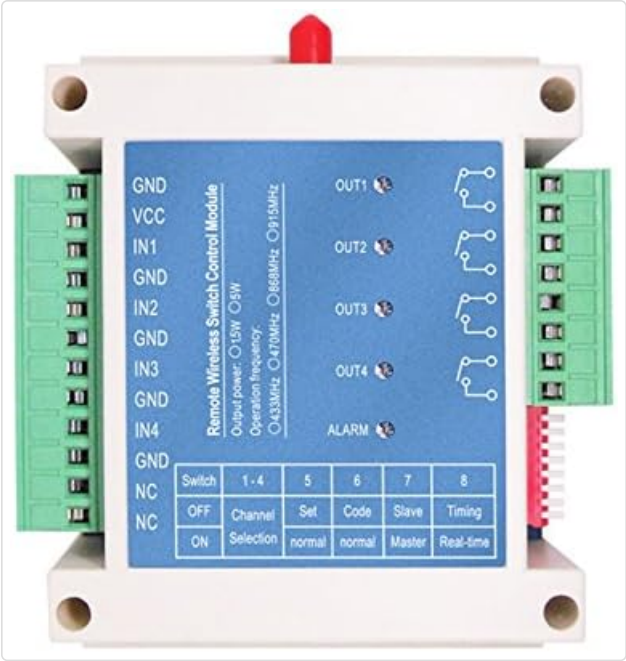


Figure 2: Top view of the SK509 module, highlighting the terminal blocks and DIP switches.

- **Power Input:** Connect your 9V-30V DC power supply to the VCC and GND terminals. Observe correct polarity.
- **Signal Inputs (IN1-IN4):** These terminals are for connecting external trigger signals or sensors. Each input has a corresponding GND terminal.
- **Control Outputs (OUT1-OUT4):** These terminals provide the control signals for external devices. The specific output type (e.g., relay contact, voltage output) should be confirmed with the detailed product specifications or datasheet.
- **NC (No Connection):** These terminals are not used.

4.4 DIP Switch Configuration

The SK509 module includes an 8-position DIP switch for configuring various operational parameters, including channel selection and operating mode. Refer to Figure 3 for the DIP switch layout and functions.

Figure 3: Detailed view of the SK509 module label, showing DIP switch functions and terminal labels.

Table 1: DIP Switch Functions

Switch	OFF Position	ON Position	Function

Switch	OFF Position	ON Position	Function
1-4	Varies	Varies	Channel Selection (16 groups)
5	OFF	ON	Set (Normal)
6	OFF	ON	Code (Normal)
7	Slave	Master	Master/Slave Mode Selection
8	Timing	Real-time	Timing/Real-time Mode Selection

Channel Selection (Switches 1-4): These switches are used to select one of 16 available wireless channels. The specific combination for each channel can be found in the detailed product datasheet. Ensure that all modules intended to communicate with each other are set to the same channel.
Set (Switch 5): This switch is typically used to enter or exit a configuration mode. When set to 'OFF', it usually indicates normal operation. Consult the datasheet for specific 'Set' mode functionalities.
Code (Switch 6): This switch may relate to pairing or coding functions. In 'OFF' position, it generally indicates normal operation. Refer to the datasheet for detailed coding procedures.
Master/Slave Mode (Switch 7): This switch determines if the module operates as a 'Master' (initiating commands) or 'Slave' (responding to commands) in a multi-module setup. Configure one module as Master and others as Slave for coordinated operation.
Timing/Real-time Mode (Switch 8): This switch selects between 'Timing' mode (where operations occur at predefined intervals or durations) and 'Real-time' mode (where operations respond immediately to input signals).

4.5 Advanced Parameter Configuration

For more detailed parameter adjustments, such as specific timing settings or advanced network configurations, the module can be connected to a PC via a UART interface. Dedicated PC software or direct UART commands can be used for this purpose. A remote controller (SK509-S) can also be used for wireless parameter modification.

5. Operating Instructions

Once the SK509 modules are properly installed and configured via DIP switches, they are ready for operation. The bidirectional nature allows for both sending control commands and receiving status feedback.

5.1 Basic Wireless Control

1. Ensure both the transmitting and receiving SK509 modules are powered on and have their antennas connected.
2. Verify that both modules are configured to the same wireless channel using DIP switches 1-4.
3. If using Master/Slave mode, ensure one module is set as 'Master' and the other as 'Slave' using DIP switch 7.
4. Apply a signal to an input terminal (IN1-IN4) on the transmitting module. This signal will be wirelessly transmitted to the corresponding receiving module.
5. The receiving module will then activate its corresponding output terminal (OUT1-OUT4), controlling the connected device.

5.2 Bidirectional Functionality

The bidirectional capability means that not only can a 'Master' module send commands to a 'Slave' module, but

the 'Slave' module can also send status or feedback signals back to the 'Master'. This allows for more sophisticated control systems where the status of a remote device can be monitored.

5.3 Real-time Mode

In Real-time mode (DIP switch 8 ON), the module responds immediately to input signals. This mode is suitable for applications requiring instantaneous control, such as direct switching of pumps or valves.

5.4 Timing Mode

In Timing mode (DIP switch 8 OFF), the module can be configured to activate outputs for specific durations or at scheduled intervals. This mode is useful for automated tasks like irrigation cycles. Specific timing parameters are typically set via PC software or UART commands.

6. Specifications

Table 2: Technical Specifications

Parameter	Value
Model	SK509
Frequency	433MHz (16 channels selectable)
Output Power	Max. 5 W
Sensitivity	-121 dB
Communication Distance	Up to 8 Km (open area)
Working Voltage	9V ~ 30V DC
Working Temperature	-40°C ~ +85°C
Modulation	GFSK
Weight	180g
Manufacturer	NiceRF Wireless Technology Co., Ltd
First Available Date	April 26, 2018

7. Troubleshooting

If you encounter issues with your SK509 module, consider the following common troubleshooting steps:

- **No Power:** Verify that the power supply is connected correctly to the VCC and GND terminals and that it provides the specified voltage (9V-30V DC). Check for loose connections.
- **No Communication:**
  - Ensure both modules are set to the same wireless channel using DIP switches 1-4.
  - Check that antennas are securely connected to both modules.
  - Confirm that one module is configured as 'Master' and the other as 'Slave' if operating in that mode.
  - Reduce the distance between modules or clear any obstructions that might be blocking the signal.
  - Check for sources of strong electromagnetic interference in the vicinity.

- **Incorrect Output Behavior:**
  - Review the DIP switch settings, especially for 'Set', 'Code', 'Master/Slave', and 'Timing/Real-time' modes, to ensure they match your intended operation.
  - Verify the wiring to the input and output terminals.
  - If using Timing mode, confirm that the timing parameters are correctly configured via PC software or remote controller.
- **Module Overheating:** Ensure the module is installed in a location with adequate ventilation. Avoid enclosing it in tightly sealed spaces without proper heat dissipation.

8. Maintenance

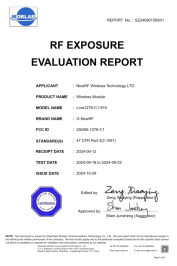
The G-NiceRF SK509 module is designed for robust operation and requires minimal maintenance. Follow these guidelines to ensure its longevity:

- **Keep Clean:** Periodically clean the module's exterior with a soft, dry cloth. Avoid using harsh chemicals or abrasive materials.
- **Environmental Protection:** Ensure the module is protected from excessive moisture, dust, and extreme temperatures outside its specified operating range. If used outdoors, an appropriate waterproof enclosure is recommended.
- **Connection Integrity:** Occasionally check all wired connections (power, input, output, antenna) to ensure they remain secure and free from corrosion.
- **Firmware Updates:** If firmware updates become available, follow the manufacturer's instructions carefully for installation.

9. Warranty and Support

For information regarding warranty coverage, technical support, or service, please refer to the documentation provided at the time of purchase or contact G-NiceRF customer service directly. Details for contacting support are typically available on the manufacturer's official website or through your product vendor.

Related Documents - SK509

	[RF Exposure Evaluation Report for G-NiceRF Lora1276-C1-915 Wireless Module] This RF Exposure Evaluation Report details the compliance of the G-NiceRF Lora1276-C1-915 Wireless Module with FCC regulations, including device category, exposure limits, and assessment results.
	[NiceRF STX883PRO ASK Transmitter Module Datasheet] Technical datasheet for the NiceRF STX883PRO ASK transmitter module, detailing its features, electrical characteristics, applications, and order information.
	[Beginner Garden for Shade: Foolproof Plant Selection and Installation Guide] Create a beautiful perennial shade garden with this guide from Better Homes & Gardens, featuring plant recommendations, layout diagrams, installation tips, and care advice for foolproof results.
	[Natures Composites Composite Raised Garden Bed Installation Guide] Step-by-step installation guide for Natures Composites Composite Raised Garden Beds, covering assembly of panels, components, and final setup for Herb, Shallow, and Medium sizes.
	[Galcon G.S.I DC Controller Installation and User Guide] Comprehensive installation and user guide for the Galcon G.S.I DC Controller, covering setup, operation, technical specifications, and troubleshooting for efficient irrigation management.

	[Miele Lave-vaisselle : Mode d'emploi et guide d'utilisation complet] Ce document présente le mode d'emploi complet pour les lave-vaisselle Miele, incluant les modèles des séries G 7180 à G 7197. Il fournit des instructions détaillées sur l'installation, l'utilisation, l'entretien et le dépannage pour une performance optimale.