

KEYWAVE

KW007

Sensor Module

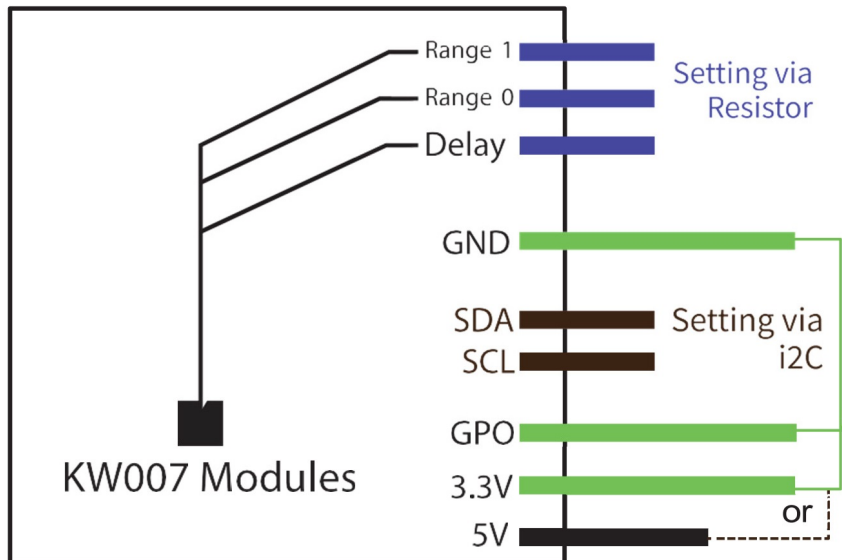
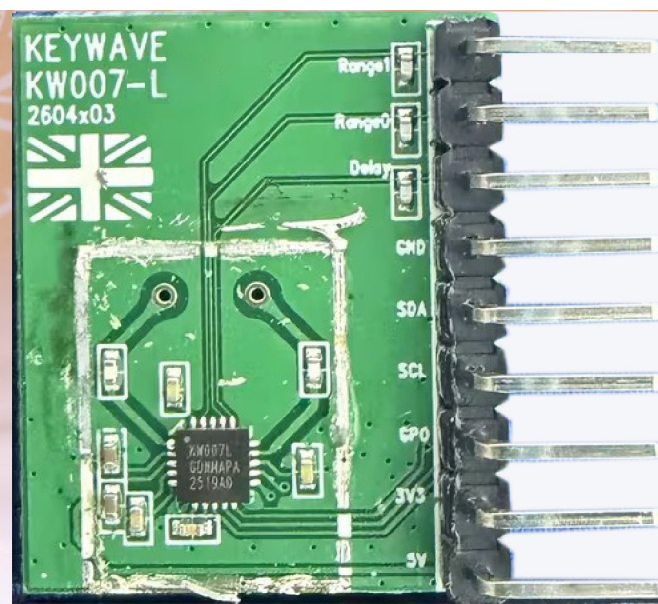
User Guide

Applicable Models

KW007-S (short-range)

KW007-L (long-range)

KW007-SE (mid-range)



1. Overview

- ◆ This guide covers:
- ◆ Basic connections (power, GND, GPO)
- ◆ Default factory settings
- ◆ Resistor-based configuration (Range & Delay)
- ◆ I²C control
- ◆ Order information
- ◆ EVK (evaluation kit)

2. Power and Quick Start

*Power: **3.3 V or 5V**:

****Connection only ONE supply, 3.3V or 5V, do not connect Both.**

5V Input Mode: Input voltage is regulated by an on-chip LDO to power the internal core.

3.3V Input Mode: Input voltage bypasses the internal LDO. A low-noise power source is mandatory.

It is recommended to employ an external LDO to minimize supply noise before the IC input.

***GND:** Ground

***GPO:** Output (pulled up to 3 V.)

3. Factory default setting

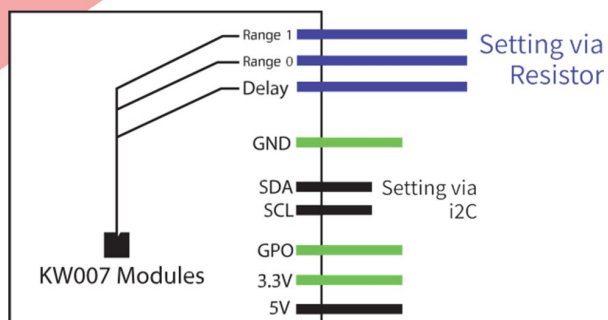
Model	Detect Range	Output pulse Hold duration (s)
KW007-S	Max, 2 Meter	64 seconds
KW007-L	Max, 10 Meters	64 seconds
KW007-SE	Max, 4 Meters	64 seconds

Confidentiality Agreement for Product Specifications / Datasheet

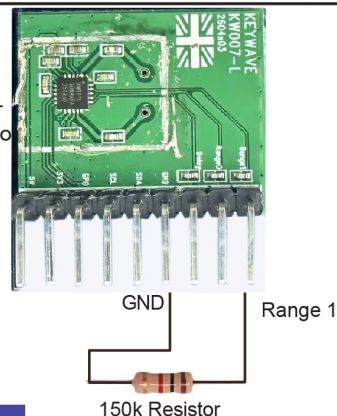
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Resistor connection how to :



4. Custom Configuration via Resistors

Delay (Output-Hold Time): populate the “Delay” pads with 0 Ω , 150 k Ω , 270 k Ω or leave open for different Settings:

Delay (Seconds) - Output Pulse Hold Duration Setting, with resistor connected to GND:

Set Delay	Setting 1	Setting 2	Setting 3	Max
Connect Resistor:	Resistor 0	Resistor 150K	Resistor 270k	Resistor Open
KW007-S	1 sec	2 sec.	4 sec.	64 sec.
KW007-L	1 sec.	16 sec.	32 sec.	64 sec.
KW007-SE	1 sec.	16 sec.	32 sec.	64 sec.

The detection distances listed below are maximum reference values. Actual performance may vary depending on environmental factors and the material or thickness of the product housing. Please adjust the Detection Intensity Level to achieve the optimal distance for your specific application.

Detection Strength (Distance): use R_0/R_1 resistor pairs connect to GND to get eight level of discrete ranges

Set Distance	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	*All Max
Range 0	0	150k Ω	270k Ω	*Open	0	150k Ω	270k Ω	*Open	*Open
Range 1	0	0	0	0	150k Ω	150k Ω	150k Ω	150k Ω	*Open
KW007-S	0.1m	0.2m	0.3m	0.5m	0.7m	1m	1.4m	2m	2.0m
KW007-L	5m	6m	7m	8m	9m	10m	11m	12m	12m
KW007-SE	0.1m	0.2m	0.3m	0.5m	0.7m	1m	2m	4m	4m

Electrical Specifications

Absolute Maximum Ratings

Characteristic	Symbol	Min	Typical	Max	Units
5V supply voltage	VDD5V	-0.3	-	6.0	V
3V3 supply voltage	VDD3V3	-0.3	-	3.6	V
Analog I/O voltage	VAIO	-0.3	-	3.6	V
Digital I/O voltage	VDIO	-0.3	-	3.6	V
RF input power	PRF	-	-	5	dBm
Ambient Temperature	TA	-25	-	85	°C

DC Characteristics

Characteristic	Symbol	Min	Typical	Max	Units
5V supply voltage	VDD5V	3.3	5.0	6.0	V
3V3 supply voltage	VDD3V3	2.5	3.3	3.6	V
Current consumption (KW007-L)	IDC	-	100	-	µA
Current consumption (KW007-S/SE)			30		

RF Characteristics

Characteristic	Symbol	Min	Typical	Max	Units
Operation frequency	FRF	-	-	5.779	GHz
RF output power (KW007-L)	PRF	-	-	0.71	dBm
RF output power (KW007-S/SE)	PRF		-	0.71	
RX noise figure	NF	-	15	-	dB
IF low-pass filter corner	FIF	-	60	-	Hz

OEM Guidance

1. Applicable FCC rules

This module has been tested and found to comply with part 15.247 requirements for Modular Approval.

2. The specific operational use conditions

This module can be used in IoT devices. The input voltage to the module is nominally **3.3V or 5V** DC. The operational ambient temperature of the module is **-25 to 85 degree C**. Only the embedded PCB antenna is allowed. Any other external antenna is prohibited.

3. Limited module procedures

N/A

4. Trace antenna design

N/A

5. RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body. This transmitter must not be located or operating in conjunction with any other antenna or transmitter

6. Antenna

Antenna type :PCB Antenna; Antenna Max. Peak Gain 3.6 dBi

7. Label and compliance information

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: 2BVHZ-KW007 "

The FCC ID can be used only when all FCC ID compliance requirements are met.

8. Information on test modes and additional testing requirements

a)The modular transmitter has been fully tested by the module grantee on the required number of channels, modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).

b)The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. It is important to note that host product manufacturers should not assume that because the modular transmitter is certified that they do not have any responsibility for final product compliance.

c)If the investigation indicates a compliance concern the host product manufacturer is obligated to mitigate the issue. Host products using a modular transmitter are subject to all the applicable individual technical rules as well as to the general conditions of operation in Sections 15.5, 15.15, and 15.29 to not cause interference. The operator of the host product will be obligated to stop operating the device until the interference have been corrected .

9. Additional testing, Part 15 Subpart B disclaimer

The final host / module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part15 digital device. The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369. For host products with certified modular transmitter, the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a)(1) through (a)(3), or the range applicable to the digital device, as shown in Section 15.33(b)(1), whichever is the higher frequency range of investigation. When testing the host product, all the transmitters must be operating. The transmitters can be enabled by using publicly available drivers and turned on, so the transmitters are active. In certain conditions it might be appropriate to use a technology-specific call box (test set) where accessory devices or drivers are not available. When testing for emissions from the unintentional radiator, the transmitter shall be placed in the receive mode or idle mode, if possible. If receive mode only is not possible then, the radio shall be passive (preferred) and/or active scanning. In these cases, this would need to enable activity on the communication BUS (i.e., PCIe, SDIO, USB) to ensure the unintentional radiator circuitry is enabled.

Testing laboratories may need to add attenuation or filters depending on the signal strength of any active beacons (if applicable) from the enabled radio(s). See ANSI C63.4, ANSI C63.10 for further general testing details.

FCC Statement

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This transmitter must not be located or operating in conjunction with any other antenna or transmitter.

Note : 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.