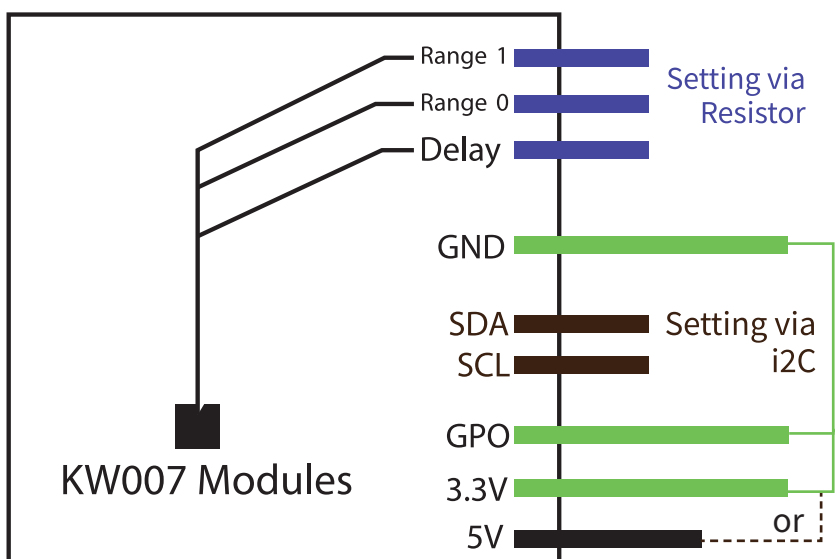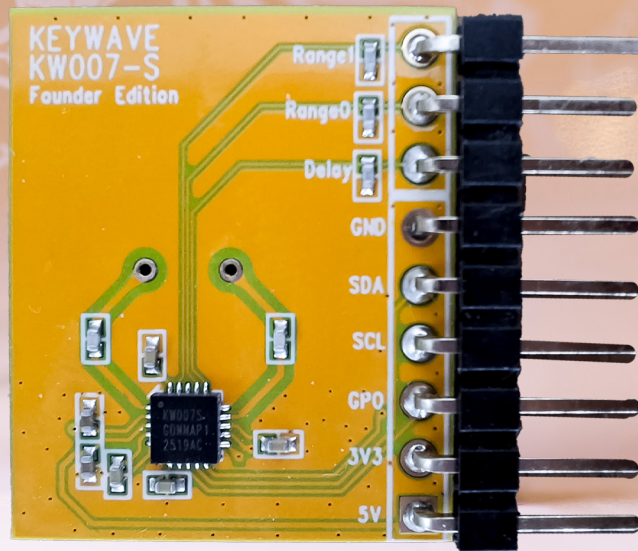# KEYWAVE

Keywave-KW007

Sensor Module

User Guide (Rev 1.2 • 01/12/2025)

Applicable Models
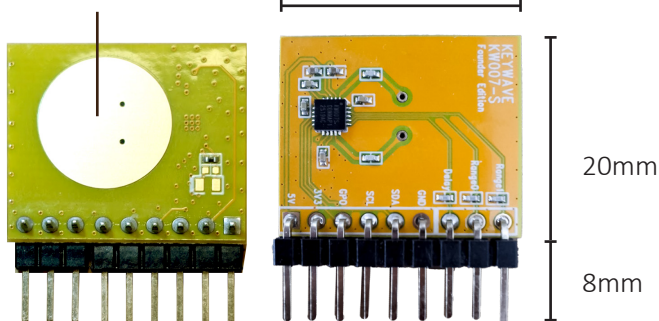KW007-S (short-range)
KW007-L (long-range)
KW007-SE (mid-range)

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.)

Diagram

Range 1 — Setting via Resistor
Range 0 — Setting via Resistor
Delay

GND

SDA — Setting via i2C
SCL

GPO
3.3V
5V — or

KW007 Modules

Sensor Antenna

22mm
20mm
8mm

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

1. Parties: This Agreement is made between Keywave Technology Limited, with its principal office at Sussex Innovation Centre, Science Park Square, BN1 9SB, UK ("Disclosing Party"), and any company or entity that requests and receives product sheets from the Disclosing Party ("Receiving Party" or "Receiving Parties").

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This Agreement shall become effective upon the receipt of the product sheets by the Receiving Party, and by receiving the product sheets, the Receiving Party agrees to the terms and conditions outlined in this Agreement.

Keywave Technology Limited ("Disclosing Party")

9. In accordance with our commitment to safeguard proprietary information and enforce the terms of our Non-Disclosure Agreement (NDA), we have integrated unique identification codes within our software. These identifiers are designed to prevent unauthorized information disclosure and facilitate the tracking of usage to ensure compliance with confidentiality obligations.

Setting via Resistor

Setting via i2C

KW007 Modules

Resisitor connection how to :

GND

Range 1
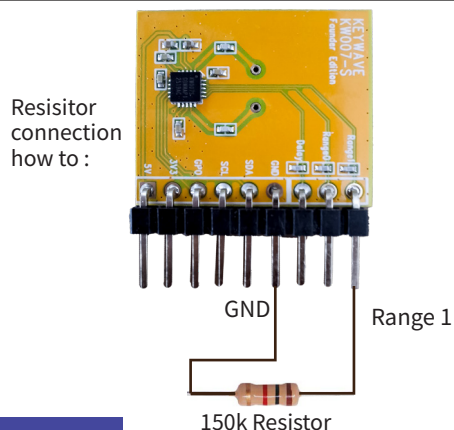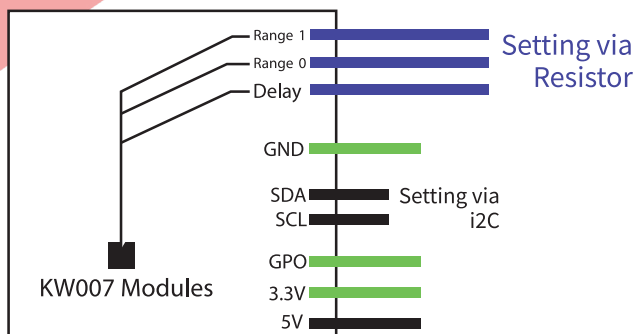
150k Resistor

4. Custom Configuration via Resistors

Delay (Output-Hold Time): populate the "Delay" pads with 0 Ω, 150 kΩ, 270 kΩ 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	150kΩ	270kΩ	*Open	0	150kΩ	270kΩ	*Open	*Open
Range 1	0	0	0	0	150kΩ	150kΩ	150kΩ	150kΩ	*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

*0 = connect to GND

* Open = no resistor fitted (∞ Ω) and not connect to GND
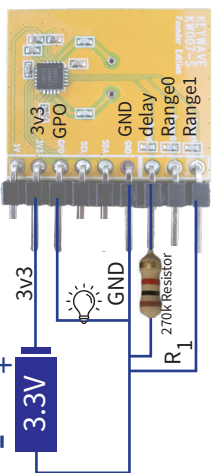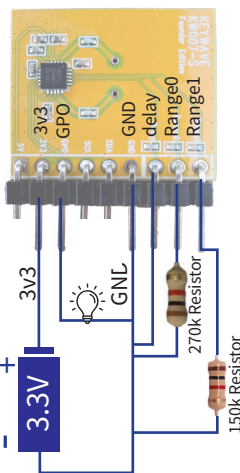
*All Max include Max sentitivity

KW007S
Range : Level 1 (~0.1m)
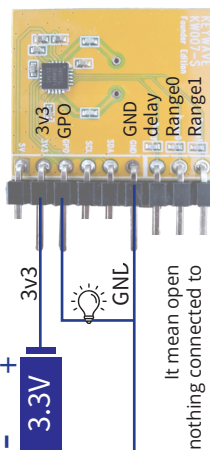GPO Hold Time:
64 sec (Max)
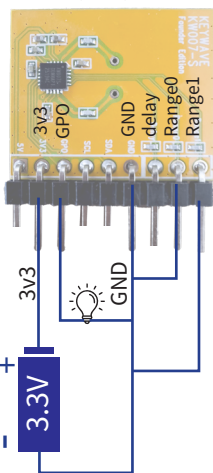
KW007S
Range : Level 4 (~0.5m)
GPO Hold Time:
4 sec (setting 3)

KW007S
Range : Level 7 (~1.4m)
GPO Hold Time:
1 sec (setting 2)

KW007S All Max
Range : Max
GPO Hold Time: Max

Connection Examples:

3v3
GPO
GND
delay
Range0
Range1

3v3
GND
3.3V

3v3
GPO
GND
delay
Range0
Range1

3v3
GND
R_1
270k Resistor
3.3V

3v3
GPO
GND
delay
Range0
Range1

3v3
GNL
270k Resistor
150k Resistor
3.3V

3v3
GPO
GND
delay
Range0
Range1

3v3
GNL
It mean open nothing connected to
3.3V

5. Detection Characteristics

Our sensor is designed to detect active motion. At close range, the sensor is highly sensitive and can detect small gestures like a hand wave. However, as the detection range increases, the environment becomes more complex. To maintain stability and prevent false triggers, targets at a greater distance require a larger displacement to trigger the sensor (e.g., walking or moving 50cm or more).
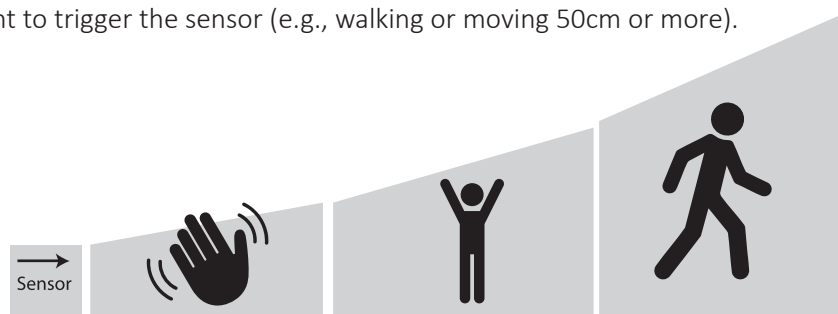
Longer ranges require larger movements for stable detection.

6. Custom Configuration Via I²C (Dynamic)

All range and pulse-width parameters can also be re-programmed on-the-fly over I²C.

Interface pins: SDA, SCL
Configurable registers: Pulse Duration (1 s – 64 s)
Detection Range (full continuous range, not limited to the eight resistor presets)
Use case: let your MCU or a Windows-based host adjust sensitivity and timeout in real time.
Please request and read additional Software development Guide for detail info.

7. Ordering & Custom Builds

10 000+ units: Specify your desired detection range & pulse duration, and we'll pre-program your modules.

IC-Only Purchases: available on request—please contact your Keywave sales representative.
or mail to : cc@keywavetech.co.uk

For the latest updates, visit our website: www.keywavewtech.co.uk

8. Evaluation Kit (EVK) for KW007 Sensor Module

To help you get started quickly with the KW007 Sensor Module, we provide an Evaluation Kit (EVK) designed to make the integration process seamless. The EVK allows you to easily modify key parameters such as GPO Hold time duration and detection range to suit the needs of your specific project.

With simple adjustments, you can tailor the sensor's performance to optimize for different applications, ensuring that the KW007 fits perfectly into your design requirements. Whether you're working on short-range detection or need extended durations for long-term monitoring, the EVK provides the flexibility to make these changes quickly and efficiently.
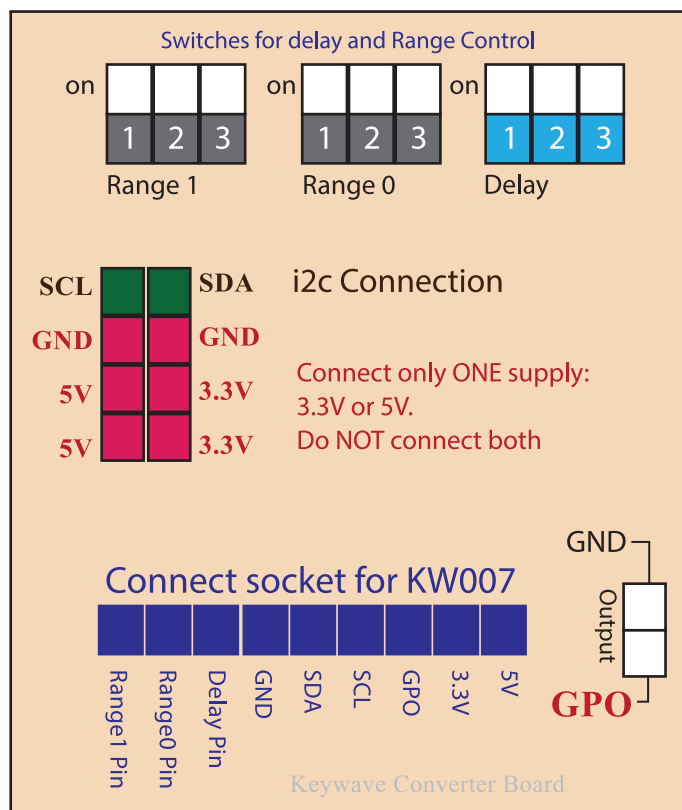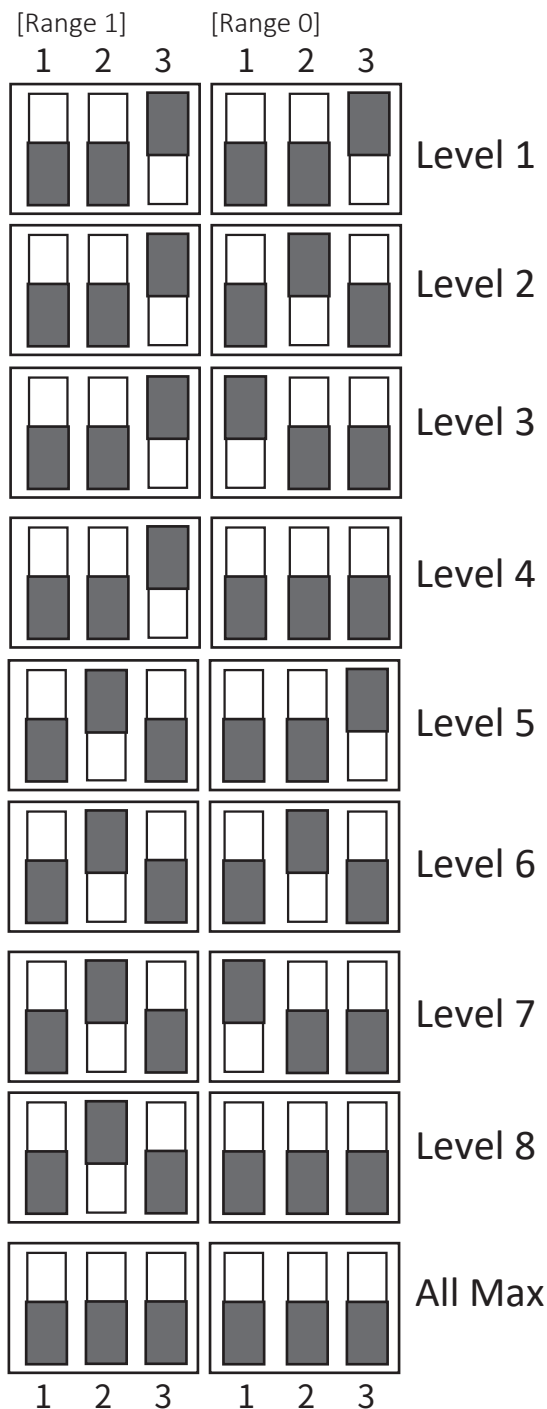

#EVK (Converter Board) Layout.
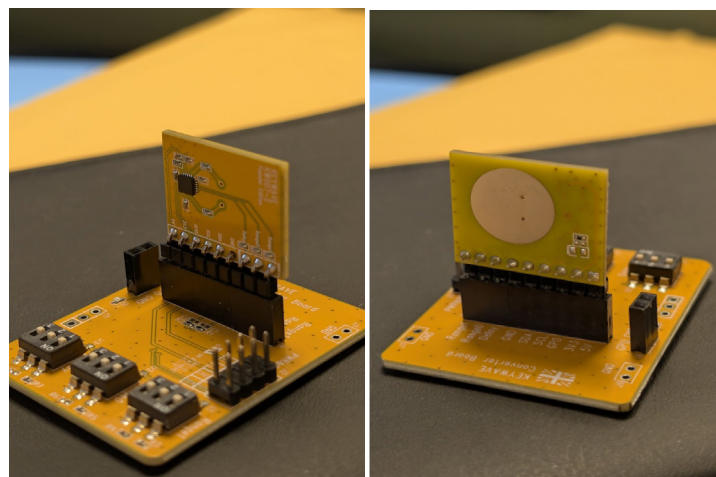
* Sensor install Direction

Output Pulse Duration (GPO High Time) Switch:

This setting determines how long the GPO pin remains in a HIGH state after the sensor is triggered.

	KW007S	KW007L	KW007SE
Max	64 sec	64 sec	64 sec
Setting 1	1 sec	1 sec	1 sec
Setting 2	2 sec	32 sec	32 sec
Setting 3	4 sec	16 sec	16 sec

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Detection Strength / Range Adjustment Switch:

[Range 1]   [Range 0]

Level 1

Level 2

Level 3

Level 4

Level 5

Level 6

Level 7

Level 8

All Max

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.

	KW007S	KW007L	KW007SE
at Level 1	0.1 meter	5 meter	0.1 meter
at Level 2	0.2 meter	6 meter	0.2 meter
at Level 3	0.3 meter	7 meter	0.3 meter
at Level 4	0.5 meter	8 meter	0.5 meter
at Level 5	0.7 meter	9 meter	0.7 meter
at Level 6	1 meter	10 meter	1 meter
at Level 7	1.4 meter	11 meter	2 meter
at Level 8	2 meter	12 meter	4 meter
at All Max (Range and Sensitivity)	2 meter	12 meter	4 meter

For the latest updates, visit our website: www.keywavewtech.co.uk