



Gesture Recognition Module

BMS31M002 User Guide

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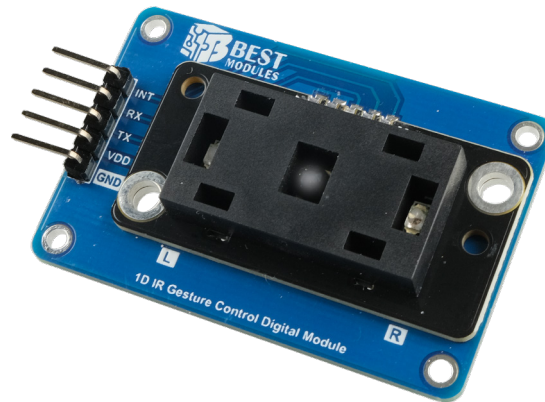
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Introduction

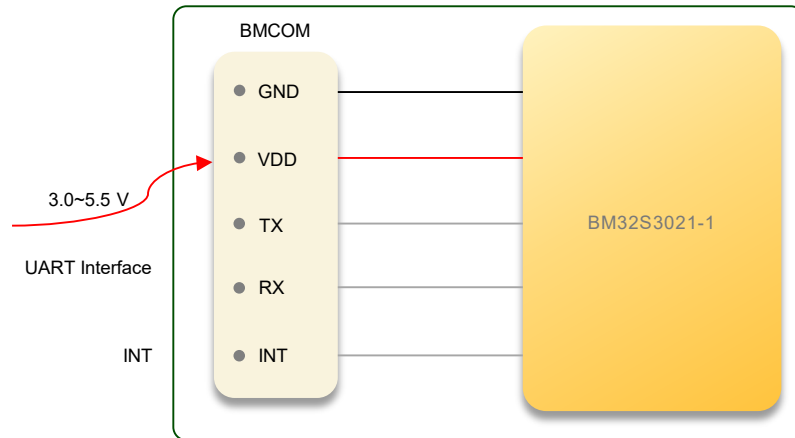
The BMS31M002 is a gesture recognition Module from Best Modules. It includes an integrated 1D IR gesture control digital module, the BM32S3021-1, which is also from Best Modules. The module detection principle is that infrared detection can recognize three gestures: left swipe, right swipe and approaching. It is suitable for application in gesture detection, and gesture judgment time can be adjusted. The module supports detection at a distance from 5cm to 25cm, and the detection distance can be adjusted by the proximity sensing trigger threshold and has the distance learning function. The module uses the UART communication mode through a BRCOM interface to implement parameter configuration, gesture recognition, and other functions. It can be applied to intelligent range hoods and automatic doors.



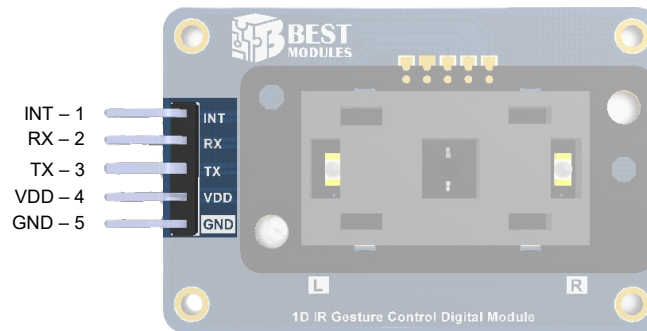
Features

- Operating voltage: 3.0V~5.5V
- Operating current: 3.75mA @ 5V (no object detected)
- On-board 1D IR gesture control digital module: BM32S3021-1
- Sensing distance: 5cm~25cm
- Sensing distance adjustment method: 191-step adjustable trigger threshold for proximity sensing
- Gesture detected time adjustment methods
 - ◆ 201-step adjustable time (20ms~820ms) for fastest gesture detection
 - ◆ 201-step adjustable time (0ms~12800ms) for slowest gesture detection
- Sensing distance learning and adjustable detection distance functions
- Communication interface
 - ◆ BRCOM×1 – INT, RX, TX, VDD, GND
 - ◆ Communication mode: UART- baud rate: 9600bps
- Provides Arduino Lib support
- Dimension: 47.92mm×31.25mm×9.6mm

Block Diagram



Pin Description



BMCOM pin:

Pin	Function	Description
1	INT	Interrupt pin. Low level, gesture detected. High level, gesture not detected
2	RX	UART receiving data line
3	TX	UART transmitting data line
4	VDD	Positive power supply
5	GND	Negative power supply, ground

Technical Specifications

Recommended Operating Conditions

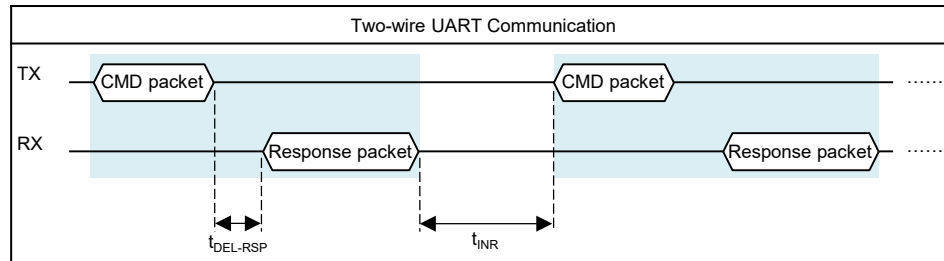
Ta=25°C

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{DD}	Operating Voltage	—	3.0	—	5.5	V
I _{DD}	Operating Current	V _{DD} =5V	—	3.75	—	mA
	Detection Distance	V _{DD} =5V	5	—	25	cm

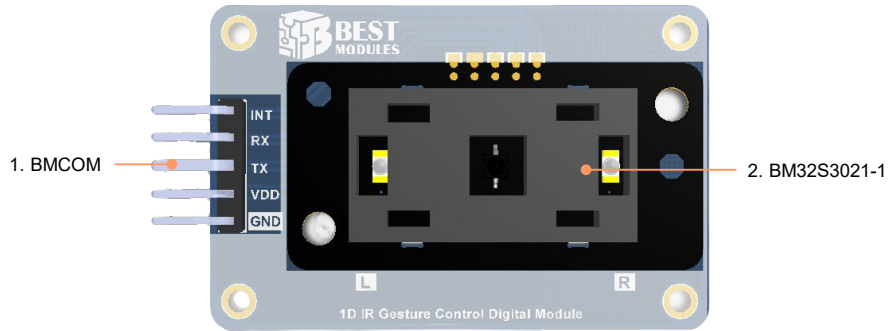
Timing specifications

Ta=25°C

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t _{DEL-RSP}	Response Delay Time	V _{DD} =5V	—	—	4	ms
t _{INR}	Interval Time	V _{DD} =5V	10	—	—	ms
	Distance Learning Time	V _{DD} =5V	2000	—	—	ms



Hardware Overview

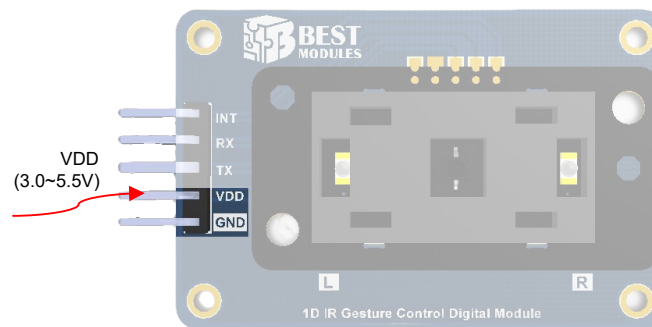


PCBA Front View



PCBA Back View

Power Supply



- BMCOM pin: 3.0V~5.5V input from VDD.

INT Pin

Module	INT Level
Gesture triggered	Low level
Gesture not triggered	High level

When a gesture is triggered, the INT pin status will remain low until the host reads the gesture status or outputs low longer time than the IRQ trigger time.

1D IR Gesture Control Digital Module: BM32S3021-1

- This is an 1D IR gesture control digital module from BEST MODULES.
- Gesture is determined by detecting changes in reflection between two infrared emitters. The BM32S3021-1, which integrates active infrared emission, reception and optical mechanisms, is designed for gesture recognition applications. The sensing distance is up to 25cm and can be calibrated.

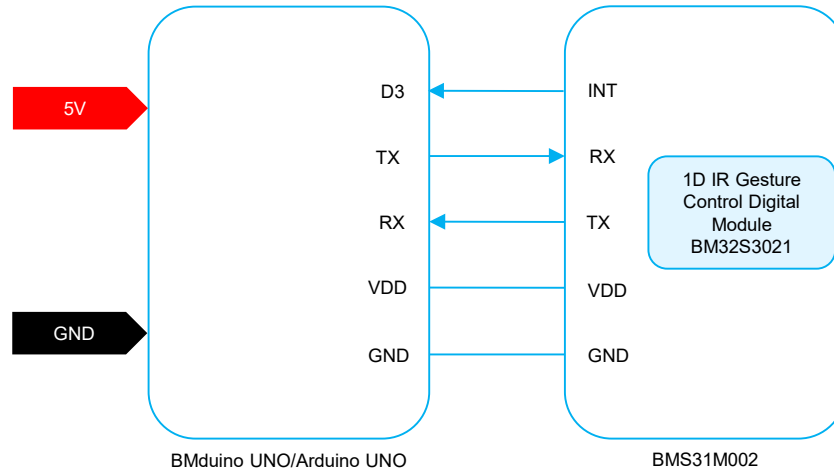
Communication Interface

- Communication mode: UART
- UART baud rate: 9600bps
- Communication logic reference voltage: 3.0V~5.5V
- Communication protocols: Refer to the BM32S3021-1 datasheet

Distance Learning Function

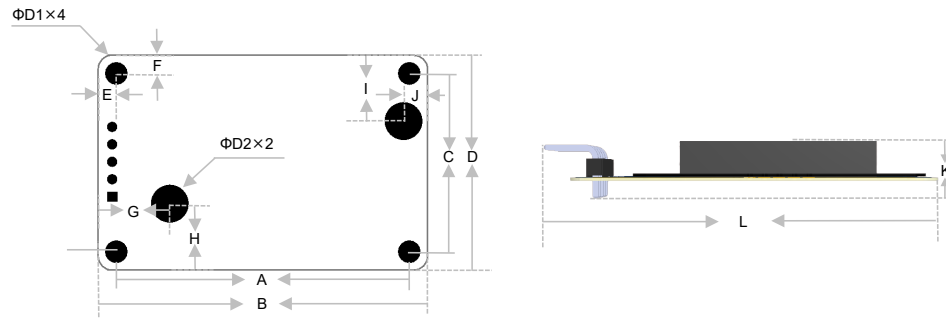
- Environment setup: Refer to the schematic diagram of the application circuit for circuit connection. An obstacle is placed above and parallel to the IR transmit-receive module. The vertical distance between the obstacle and the IR transmit-receive module is the distance to be learned. Here the learning distance ranges from 5cm to 25cm.
- Operating process:
 - ◆ Start distance learning: The host sends commands to the module to enter the distance learning mode.
 - ◆ Complete distance learning: After issuing the distance learning command, the INT pin level is pulled low, and when the INT pin level changes to high, it means that the learning is complete. It is also possible to obtain the gesture sensing status, which means that distance learning is complete when the calibration status changes from calibration to normal mode.
 - ◆ Successful or unsuccessful: Gestures can be recognized within the learning distance, and gestures cannot be recognized outside the learning distance, indicating that the learning was successful. Otherwise, the learning was unsuccessful.

Application Circuit



Connection Schematic Diagram

Dimensions



Dimension Information

No.	Unit	mm	inch
A		42.62	1.678
B		47.92	1.875
C		25.95	1.022
D		31.25	1.230
E		2.65	0.104
F		2.65	0.104
G		10.42	0.410
H		9.64	0.380
I		9.60	0.378
J		3.5	0.138
K		9.6	0.380
L		53.16	2.093
ΦD1		2.2	0.087
ΦD2		3.3	0.130

Dimension List

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