

# Door/Window Contact Sensor (Intrusion Sensor)

Smart Home Halacha Project - Hardware Documentation

## Overview

This document provides technical specifications and Zigbee2MQTT (Z2M) configuration details for **Zigbee door/window contact sensors**, commonly used for intrusion detection in smart home setups. The examples shown include the popular **Aqara MCGQ11LM** and similar **Tuya TS0203** models.

## Product Images (AliExpress Samples)

*Note: These images are representative examples from AliExpress listings. Actual products may vary by seller.*



Aqara door/window sensors - works with Mi Home and Apple HomeKit



Low-Profile Mini Design: No Wiring, Installation Free, 2-Year Battery Life

# Technical Specifications

## Aqara MCCGQ11LM

Parameter	Value
Model	MCCGQ11LM
Battery	CR1632 (included)
Wireless Protocol	Zigbee
Dimensions	41 x 22 x 11 mm (1.61 x 0.87 x 0.43 in.)
Maximum Detection Distance	22 mm
Operating Temperature	-10C to +45C (14F to 113F)
Operating Humidity	0-95% RH, non-condensing
App Support	Apple Home (iOS 10.3+), Aqara Home, Mi Home

## Tuya TS0203 (Alternative)

Parameter	Value
Zigbee Model	TS0203
Manufacturer	_TZ3000_oxslv1c9
Type	Door/window sensor
Protocol	Zigbee 3.0

# Operating Principle

Door/window contact sensors use a **magnetic reed switch** mechanism:

- **Main Unit:** Contains the reed switch and Zigbee radio
- **Magnet:** Small magnetic piece attached to the moving part (door/window)
- **Detection:** When magnet is near (door closed), circuit is closed; when separated (door open), circuit opens
- **Detection Distance:** Typically 15-22mm maximum gap for reliable detection

## Sensor States

Physical State	Sensor Reading	Contact Value
Door/Window Closed	Magnet Near	true (Closed)

Door/Window Open	Magnet Far	false (Open)
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# Zigbee2MQTT Integration

## Device Identification (Tuya TS0203)

Field	Value
Zigbee Model	TS0203
Description	Door/window sensor
Manufacturer	Tuya
MQTT Topic	zigbee2mqtt/[device_name]
Support Status	Supported: native

## Exposed Parameters

Parameter	Type	Description
Contact	Boolean	Indicates if contact is closed (true) or open (false)
Battery	Percentage	Remaining battery (may take up to 24 hours to report)
Voltage	Integer (mV)	Battery voltage in millivolts
Tamper	Boolean	Indicates if device has been tampered with
Link Quality	Integer (lqi)	Zigbee signal strength
Battery Low	Boolean	Low battery warning flag

## Sample JSON State Payload

```
{ "battery": 93, "battery_low": false, "contact": true, "linkquality": 131, "tamper": false, "voltage": 2600 }
```

## Z2M Interface Screenshots

The screenshot shows the 'About' tab for a device named 'intrusion\_1'. The interface includes a top navigation bar with tabs: About, Exposes, Bind, Reporting, Settings, Settings (specific), State, Clusters, Groups, Scene, and Dev console. The 'About' tab is active. On the left, there is a 3D model of a white door/window sensor. To the right of the model, the device name 'intrusion\_1' is displayed with a link icon. Below the name, there is a green status bar indicating 'Supported: native' and 'Interview state: ✓'. A link 'Edit description' is also present. The main content area is divided into several sections: 'EndDevice' with a hex address bar, 'Network address' with a hex address bar and its decimal format '38474', 'Power' showing '93%' battery, 'Zigbee Model' as 'TS0203' with the description '\_TZ3000\_oxsiv1c9 (Door/window sensor)', 'Model' as 'TS0203' with the manufacturer 'Tuya', 'Firmware ID' as 'Unknown', 'Last seen' as 'N/A' with 'Availability: Disabled', and 'MQTT' topic as 'zigbee2mqtt/intrusion\_1'. At the bottom right, there is a 'Report problem' button and a row of four icons: a link icon, a share icon, an information icon, and a delete icon.

intrusion\_1

i About Exposes Bind Reporting Settings Settings (specific) State Clusters Groups Scene Dev console

intrusion\_1 [Edit description](#)

Supported: native Interview state: ✓

EndDevice	Network address	Power
		93% Battery
Network address in decimal format: 38474		

Zigbee Model	Model	Firmware ID
TS0203 _TZ3000_oxsiv1c9 (Door/window sensor)	TS0203 Tuya	Unknown Unknown

Last seen  
**N/A**  
Availability: Disabled

MQTT  
**zigbee2mqtt/intrusion\_1**

Report problem

About Tab: Device identification (TS0203), battery status, MQTT topic

The screenshot shows the 'Exposes' tab for the same device 'intrusion\_1'. The top navigation bar is the same, but the 'Exposes' tab is active. The main content area lists several device capabilities: 'Contact' with a description 'Indicates if the contact is closed (= true) or open (= false)' and a value of 'Closed'; 'Battery' with a description 'Remaining battery in %, can take up to 24 hours before reported' and a value of '93 %'; 'Voltage' with a description 'Voltage of the battery in millivolts' and a value of '2600 mV'; 'Tamper' with a description 'Indicates whether the device is tampered' and a value of 'Clear'; and 'Linkquality' with a description 'Link quality (signal strength)' and a value of '131 lqi'. Each entry has a corresponding icon: a door for Contact, a battery for Battery, a lightning bolt for Voltage, an exclamation mark for Tamper, and a signal strength icon for Linkquality.

intrusion\_1

i About Exposes Bind Reporting Settings Settings (specific) State

Contact  
Indicates if the contact is closed (= true) or open (= false)  
**Closed**

Battery  
Remaining battery in %, can take up to 24 hours before reported  
**93 %**

Voltage  
Voltage of the battery in millivolts  
**2600 mV**

Tamper  
Indicates whether the device is tampered  
**Clear**

Linkquality  
Link quality (signal strength)  
**131 lqi**

Exposes Tab: Contact state, battery %, voltage, tamper status, link quality

intrusion\_1

AboutExposesBindReportingSettingsSettings (specific)StateClustersGroupsSceneDev console

Read about this in the documentation...

debounce

Debounces messages of this device

debounce\_ignore

Protects unique payload values of specified payload properties from overriding within debounce time

disabled

Disables the device (excludes device from network scans, availability and group state updates)

filtered\_attributes

Filter attributes with regex from published payload.

filtered\_cache

Filter attributes with regex from being added to the cache, this prevents the attribute from being in the published payload when the value didn't change.

filtered\_optimistic

Filter attributes with regex from optimistic publish payload when calling /set. (This has no effect if optimistic is set to false).

Settings Tab: Standard Zigbee device settings (debounce, disable, filter options)

intrusion\_1

AboutExposesBindReportingSettings

Settings (specific)State

Empty exposes definition

Settings (Specific): Empty - no device-specific settings available

intrusion\_1

 About  Exposes  Bind  Reporting  Settings  Settings (specific)  State 

```
{
  "battery": 93,
  "battery_low": false,
  "contact": true,
  "linkquality": 131,
  "tamper": false,
  "voltage": 2600
}
```

State Tab: Raw JSON payload showing current sensor state



# Halachic Considerations

## *Key Differences from Presence Sensors*

Unlike mmWave/PIR presence sensors, door/window contact sensors have significant differences relevant to halachic analysis:

- **Passive Detection:** The sensor doesn't actively scan - it only detects the magnetic field state
- **Binary State:** Simple open/closed, no complex processing
- **No Disable Option:** Cannot be 'disabled' via software - the reed switch always responds to the magnet
- **Direct Physical Causation:** Opening a door directly causes the sensor state change (not grama)

## *The Core Question*

When a person opens a door on Shabbat, and a contact sensor detects this:

- Is the person considered to have 'done work' by changing an electrical state?
- Does it matter if the sensor change triggers an automation vs. simply being logged?
- Is the act of opening the door (permitted) separable from the sensor detection (potentially problematic)?

## *Possible Approaches*

- **Disable Automations:** Keep sensor active but disable all Shabbat automations
- **Physical Removal:** Remove sensor batteries before Shabbat
- **Z2M Disable:** Use the 'disabled' setting to exclude from network
- **Accept Passive Monitoring:** If no actions are triggered, some may permit passive state logging

**Important:** These are technical options only. Consult a qualified posek for halachic guidance.

# Comparison: Door Sensor vs. Presence Sensor

Aspect	Door/Window Sensor	Presence Sensor
Detection Method	Magnetic reed switch	mmWave radar + PIR
Active/Passive	Passive	Active scanning
Configurable Sensitivity	No	Yes
Can Be "Disabled" via Software	Only via Z2M exclusion	Potentially via threshold settings
Detection Trigger	Physical movement of door	Human presence/motion
Causation Type	Direct	Potentially grama
Battery Life	2+ years	Variable