Aqara Smart Door Lock A100 (Overseas)

Introduction

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Overview: First Smart Door Lock Supporting Three Unlocking Modes with Aqara Apple Devices

The overseas version, available to clients of Southeast Asia and Russia, is upgraded based on the domestic A100.

- **Compatible with 3 ecosystems:** HomeKit, Aqara Home, Google Home.
- **Seven unlocking modes:** Fingerprint, password, NFC card, mechanical key, Bluetooth (Aqara / HomeKit), remote unlocking (Aqara / HomeKit / Google Home, hub required), Apple home key
- **Lock body upgrade: Double fast electronic lock body supporting full bolt detection**
- Support other A100 smart functions

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Aqara

Part 1

Industrial Design

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Aqara

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Interaction

Unlocking by holding the handle

Open the door at one go with the integrated design.

Fast automatic verification

After entering the password, it will be verified automatically in real time without clicking the "√" key.

Breathing light interaction

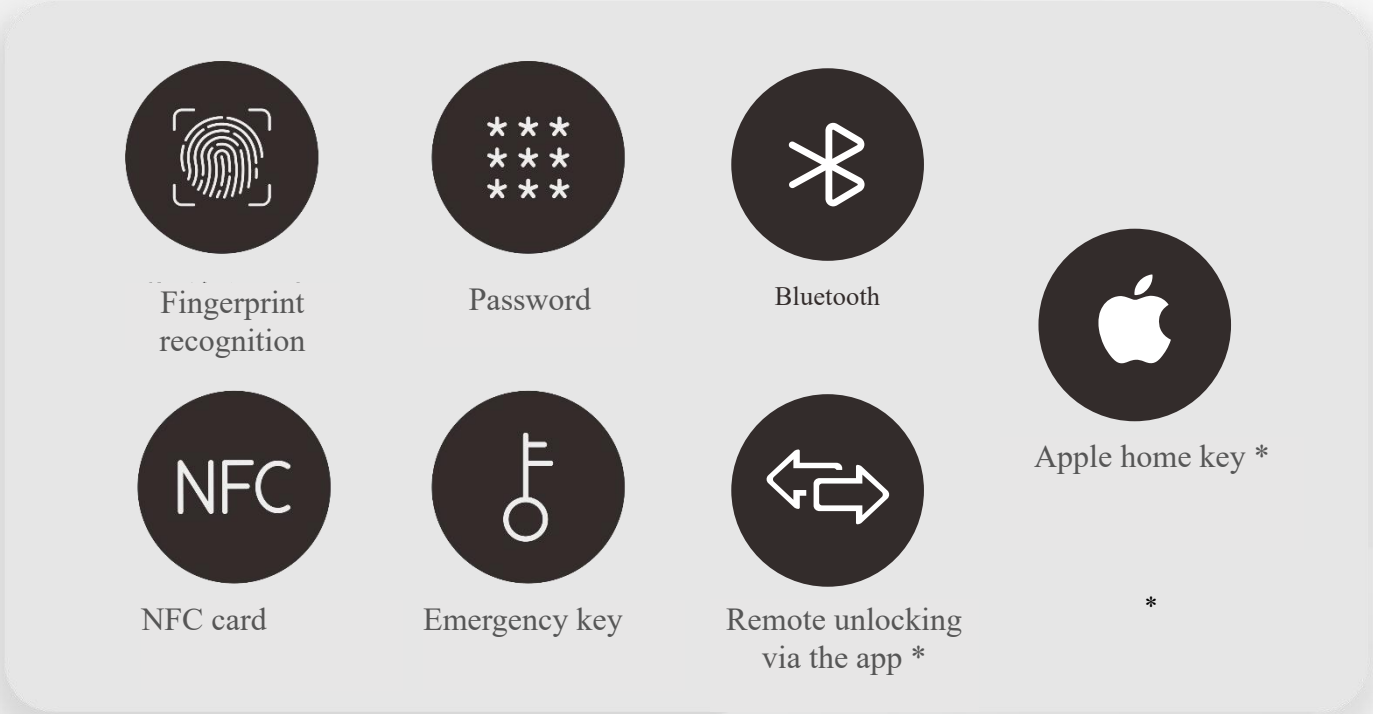
The breathing light of the front panel can guide users to complete registration and verification.

Part 3

Functionality

3.1 Unlock

7 Unlocking Methods



* An Apple home key is available on an iPhone or Apple Watch
** Remote unlocking is available when connecting to Apple home center or Aqara hub

3.1.1 Fingerprint

1 One-to-one fingerprint module & encrypted binding

- The fingerprint module has a unique encrypted serial number and is encrypted and bound with the main control chip.
- If the module is replaced by damaging or removing the front panel, the door lock will refuse to communicate with the module and cannot be unlocked.

2 Customized PB fingerprint algorithm

- Unlock the door by holding the handle integrated with a fingerprint reader
- Precise Biometrics fake fingerprint detection algorithm
- Feature points + image fusion recognition algorithm create an efficient and safe unlocking way.
- 160*160 high resolution fingerprint module
- Fingerprint self-learning algorithm
- Fingerprint verification within 500ms

3 3D capacitor recognition

- The electronic signal will be able to reach the finger dermis and read the deep fingerprint. The fingerprint image remains unaffected by the dead skin of the epidermis.
- 3D data is collected by detecting real fingerprint ridges and valleys. The door cannot be unlocked with 2D fake fingerprint images.

* Refer to the definition of 3D fingerprint in Baidu Baike:
https://baike.baidu.com/item/3D%E6%8C%87%E7%BA%B9/5446212

3.1.2 Other Unlocking Modes

Password

- Ordinary password - not allowed to be created remotely
- (Temporary) one-time password - allowed to be created remotely
- (Temporary) periodic password - allowed to be created remotely
- The password should be 6-10 digits in length, and supports 20 virtual bits.

Apple home key

- iPhone (Apple key)
- Watch (Apple key)
- Home key sharing

Short-range control (Bluetooth required)

- Aqara Home app
- Apple Home app

Remote control (hub required)

- Aqara Home app
- Apple Home app
- Google Home app

NFC physical card

Mechanical key

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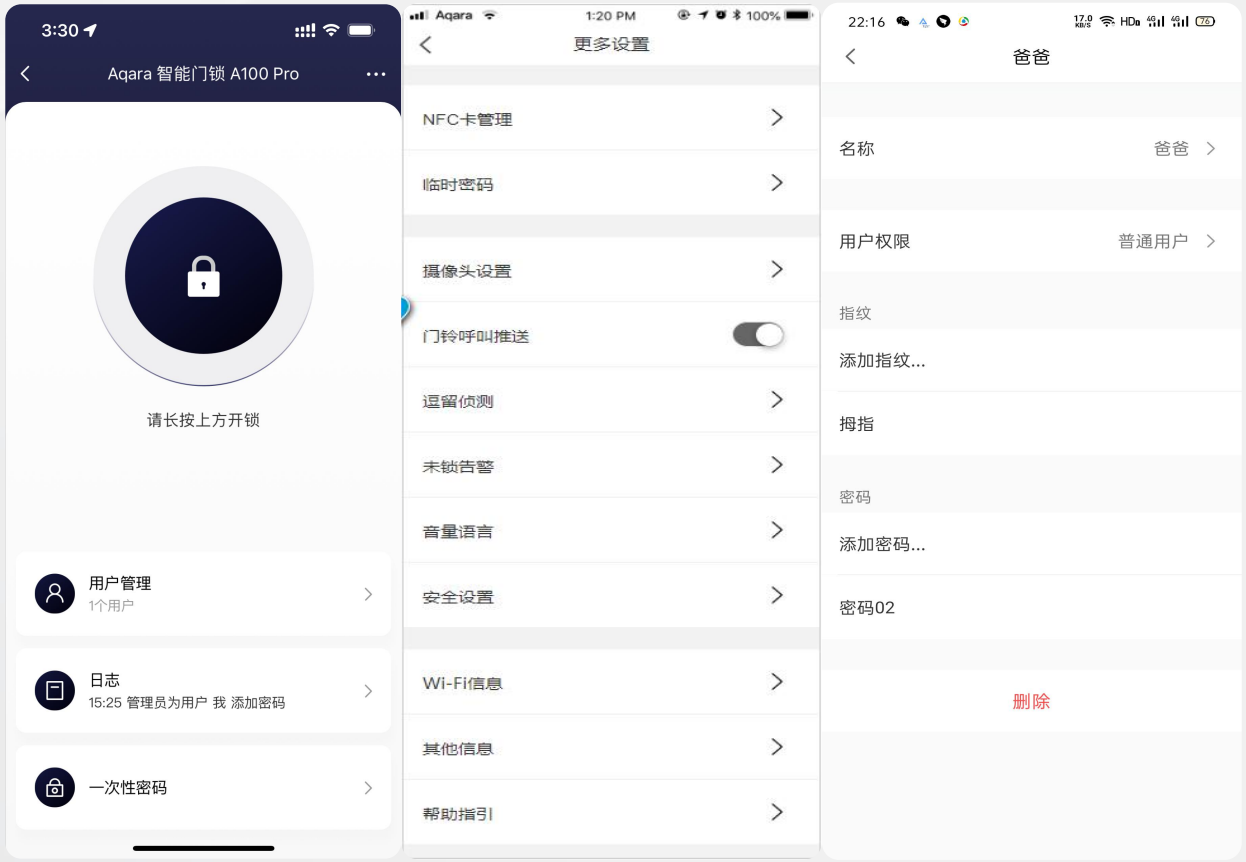
* An Apple home key is effective with versions of iPhone XR and higher on iOS 15 (or higher) or watchOS 8.0 (or higher).

iOS 15 Wallet Key

- New functions released in WWDC 2021 are in progress and expected to be delivered by the end of December 2021
- A100 overseas version is the first batch of smart door lock supporting the function

3.2 Various Function Experiences with Aqara Home App



A100 is bound to the app via the hub to enable the whole house smart services

Multiple Aqara products can be connected through the app, and automatic smart home scenes can be configured.

Manage the door lock with Aqara Home App

- **User management -** adding / deleting user accounts, and setting user identity credentials, user attributes (admin / ordinary users) and user permissions.
- **Unlocking mode management -** fingerprint, password, NFC card.
- **Door lock operation -** viewing the door lock status and logs, door lock notification and alarm.
- **Supports basic functions of 2 ecosystems -** HomeKit app and Google Home app, in respect of door status display, abnormal alarm, remote / short-range unlocking.

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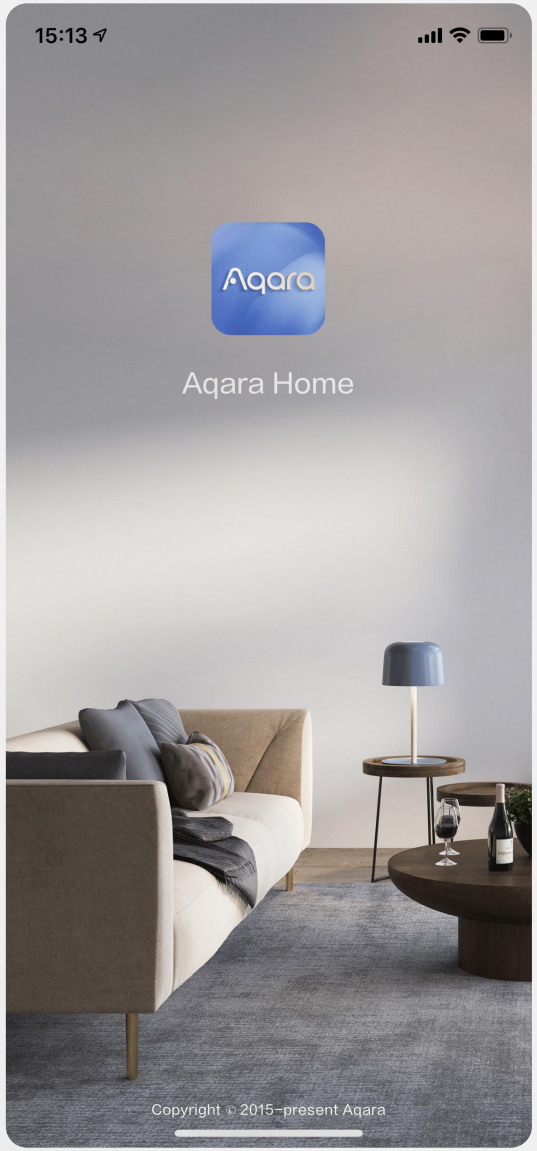
* Complete Aqara Home app functions require Aqara hub.

3.3 Remote OTA



A100 (overseas) supports remote upgrade with Aqara Home app

Provides users with a permanent and full-featured door lock and smart home experience

Part 3

Functionality

4.1 Top Hardware Security

NO.1
Electronic lock body and C-class secure lock cylinder

NO.2
Lock body clutch

NO.3
Anti-dismantle detection

NO.4
Anti-trailing design

NO.5
Smart counter lock

NO.6
Rear main control

- **Complete functions:** Equipped with latch bolt, detection tongue, multi-point spring bolt and night latch bolt
- **Whole bolt status detection:** Support app viewing and control
- **Direct-embedded C-class secure lock cylinder :** In case of the front panel is damaged or disassembled, there is still a complete door with C-class lock cylinder. Under the standard for lock cylinders in *GA/T 73-2015 Mechanical Anti-theft Lock*, the safety class rating is C > B > A.

Latch bolt
Used for fixing the door with the frame

Detection tongue
Used for detecting door switch

Multi-point spring bolt
Used for anti-violence unlocking

Night latch bolt
Used for preventing technical unlocking and acquaintance unlocking

* Non-physical product. Schematic diagram only.

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4.1 Top Hardware Security

NO.1 Electronic lock body and C-class lock cylinder | **NO.2 Lock body clutch** | NO.3 Anti-dismantle detection | NO.4 Anti-trailing design | NO.5 Smart counter lock | NO.6 Rear main control

The clutch is set inside the front panel

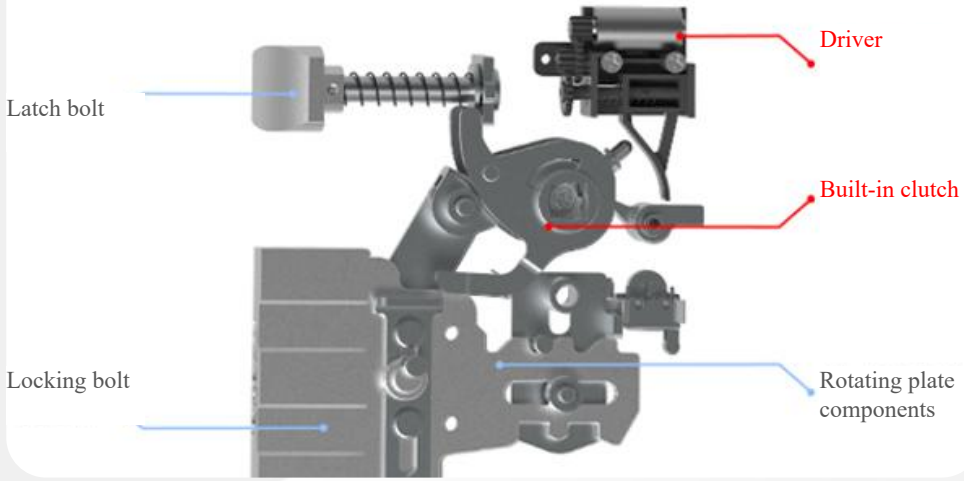
The smart lock with a clutch on the front panel is unsafe.

- It can be unlocked when the front panel is damaged.
- Insert tools (e.g. steel ruler) into the gap of the front panel to get the square shaft stuck, and it can also be unlocked.

* Non-physical product. Schematic diagram only.

The clutch embedded in the lock body makes it safer

The lock can not be opened even if the outer panel is damaged or use the external clutch unlocking tool



* Non-physical product. Schematic diagram only.

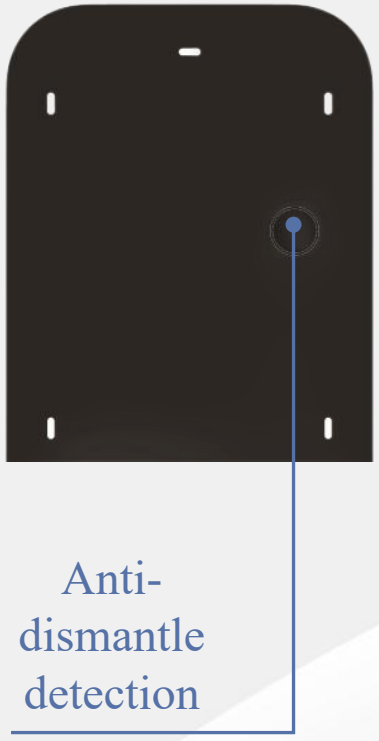
The clutch in the lock body instead of the front panel is safer.

- If the front panel is damaged or removed, it cannot be unlocked.
- It is difficult to unlock even with tools

4.1 Top Hardware Security

NO.1 Electronic lock body and C-class lock cylinder | NO.2 Lock body clutch | **NO.3 Anti-dismantle detection** | NO.4 Anti-trailing design | NO.5 Smart counter lock | NO.6 Rear main control

* Non-physical product.
Schematic diagram only.



The back of the front panel is equipped with an anti-disassembly detection press switch

1. Under normal conditions, the pressing piece remains being pressed.
2. When someone removes the panel, the pressing piece is separated from the door body.
3. The signal will be given out upon releasing.
4. The door lock starts the audible and visual alarm and then sends it to the mobile phone.

4.1 Top Hardware Security

NO.1	NO.2	NO.3	**NO.4**	**NO.5**	NO.6
Electronic lock body and C-class lock cylinder	Lock body clutch	Anti-dismantle detection	**Anti-trailing design**	**Smart counter lock**	Rear main control

Anti-trailing design

The handle will rebound automatically after unlocking, and lock the door immediately. The follower cannot unlock the door by pushing down the handle again.

* Non-physical product. Schematic diagram only.

Smart counter lock

- In the counter-lock state, only the administrator is allowed to unlock the door.
- The mechanical key cannot unlock the counter lock (ensure high indoor security to prevent unlocking the door by damaging the lock cylinder).

* Non-physical product. Schematic diagram only.

4.1 Top Hardware Security

- **The main control chip of some smart locks for unlocking is on the front panel.** After removing the front panel, the intruder can unlock the lock by controlling the clutch after sending a signal to the lock body.

- The verification and unlocking control programs of A100 (including the overseas version) are **all deployed in the main control of the rear panel**. The drive circuit for unlocking is also on the rear panel circuit board. Even if the front panel is damaged and disassembled, the intruder cannot unlock it.

4.2 Software Safety Support

Alarm Mechanism

1. **Prying-resistant alarm:** When the door lock is pried and the distance between the front panel and the door surface is separated abnormally, the anti-disassembly pressing switch will be triggered. The door lock will trigger the local audible and visual alarm and send it to the mobile phone. It can also connect with the hub or other devices to alarm.
2. **Test forbidden alarm:** When the fingerprint, password or NFC card fails to verify for many times, these verification methods will be locked for 3 minutes, and the door lock will push the alarm to the mobile phone.
3. **Low battery alarm:** Remind low battery when the power is less than 20%.
4. **Door unlatched / non-closed alarm:** When the door lock is found falsely closed or not closed with latch bolt and detection tongue, it will trigger sound effect and light alarm and push the alarm to the mobile phone.

A100 (Overseas) Functions

- Fingerprint
- Password
- Temporary password (one-time / periodical)
- Mechanical key
- NFC
- Bluetooth (Aqara / HomeKit)
- Remote connection (Aqara / HomeKit / Google)
- Apple home key (iPhone / Watch)
- Setting door lock with app
- Abnormal alarm (local / mobile phone)
- Various linkage control condition
- 100 thousand times of handle pressing test
- Convenient local setting functions
- Bluetooth connection
- Zigbee connection
- OTA upgrade
- Lock body clutch
- Rear main control
- Fingerprint module encrypted binding
- Mabuchi clutch motor
- Ultra-long life battery for 18 months
- Emergency charging (Type-C)
- 3D capacitive fingerprint recognition
- Customized PB fingerprint recognition algorithm
- Direct-embedded C-class mechanical cylinder

Part 5 Product Specs

A100 (Overseas) Parameters

Parameter	Detail
Product Name	Aqara Smart Door Lock A100
Model	ZNMS02ES
Dimensions	375 × 77 × 23.6 mm
Unlocking way	Fingerprint, password, emergency key, NFC, app Bluetooth, app remote control, Apple home key, etc * apps refer to those of Aqara, HomeKit and Google
Voice language type	Human voice in Chinese and English
Battery specification	8 AA dry batteries, 6V DC
Endurance	18 months (8 original batteries, 10 times per day)
Emergency power supply	External power supply with Type-C, 5V DC
Anti-static	8KV for contact, and 15KV for non-contact
RTC accuracy	The crystal frequency deviation is 20.075 ppm, and the error is ± 1.73 s/day
Working temperature	-25℃ - +55℃

Unlocking way	Parameter	Detail
Fingerprint	Response time	< 0.5s
	Fingerprint capacity	50
	FAR	＜ 0.0001%
	FRR	＜ 0.01%
	Other features	Fingerprint recognition module Semiconductor liveness detection
Ordinary password Temporary password	Password length	6-10 valid digits
	Password capacity	75 sets for in total ordinary / temporary passwords; 8 sets/hour for temporary / one-time password
	Virtual password	20 virtual bits (including real password)
M1 Card	Support Device	M1 physical card
	Capacity	25
Emergency key	Key type	Mechanical key

Parameter	Detail
Lock body type	6068 Lock body
Lock body feature	Direct-embedded cylinder, handle overload protection, two-stage large square shaft and whole latch bolt detection
Bolt type	Latch bolt, detection tongue, multi-point spring bolt and night latch bolt

Wireless Type	Item	Parameter
M1 Card	Frequency	13.56 MHz
	Read-write distance	≤ 2cm
Zigbee	Standard	Zigbee3.0
	Communication distance	＞ 30m (indoor)

Thank You.

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