



Glossary

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Contents

1	Hardware development	2
1.1	Smart product	2
1.2	Communication	4
1.3	Hardware	12
2	Embedded development	15
3	Cloud development	20
3.1	Cloud Development Platform	20
3.2	Common terms	24
4	App	30
5	Third-party connection	34
6	Others	37



Contents

This topic describes the commonly used terms on the Tuya AI+IoT Platform.

1 Hardware development

1.1 Smart product

Term	Description
Device	<p>A device is any piece of equipment made for a particular purpose, especially a mechanical or electrical one. During long-term use, a device keeps its original form and functions unchanged.</p> <p>Generally, a device refers to a product on the Tuya AI+IoT Platform and has the same meaning as hardware.</p>
Hardware	<p>Hardware refers to physical components and devices that you can see and touch. Generally, it refers to products.</p>
HSV	<p>HSV stands for hue, saturation, and value. HSV is a color model that uses three-dimensional coordinates to perceive the color.</p>
IPC	<p>IPC stands for IP camera. IPC is a new generation of a camera that integrates a traditional camera with network technology.</p>
SoC	<p>SoC stands for system on a chip. An SoC device does not have a microcontroller unit (MCU). The control programs are written into SoC or the module.</p>

Term	Description
OSD	<p>An on-screen display (OSD) is an on-screen menu for adjusting the display. After you press the Menu button, the screen pops up a rectangular menu of the display. You can select viewing options or adjust components of the display, such as the color, mode, and geometric shape, to achieve optimal display status.</p>
Module	<p>A module is a component that is integrated into an embedded electronic system to connect the system to a network. A module is the circuit module that connects the embedded system to the network. Currently, Tuya provides the following modules for network connections in different modes:</p>
	<p>Wi-Fi module</p>
	<p>GPRS module</p>
	<p>Bluetooth mesh module</p>
	<p>Wi-Fi and Bluetooth low energy combo module</p>
	<p>Zigbee module</p>
	<p>Sub-G module</p>
	<p>NB-IoT module</p>
DP	<p>A data point (DP) represents a smart device function.</p>

Term	Description
	<p>Tuya abstracts each function into a data point. DPs are defined in different data types, such as Boolean, enumeration, and integer.</p> <p>DPs have read and write attributes. For example, a 2-gang switch has two Boolean DPs, and each DP has either a <code>True</code> or <code>False</code> value, which is readable and writable.</p>
	<p>To read means to get the current value of the switch, and to write means to change the current value of the switch.</p>
DPID	<p>DPID specifies the ID of a DP event under a communication protocol.</p>
DeviceID	<p>Device ID, the identifier of the device.</p>
DPCode	<p>The unique identifier of a DP event. In most cases, the DPCode is the same for the same DP event under different communication protocols.</p>
Authkey	<p>The device authentication key issued by the Tuya IoT Platform. The Authkey is strongly bound to the PID and UUID.Note: This parameter is very important and will be used during device authentication. Keep it safe.</p>

1.2 Communication

Term	Description
Gateway	Bluetooth mesh and Zigbee devices cannot directly connect to the network, so a gateway is required, which has both Bluetooth communication and network connection capabilities. Through the gateway, local Bluetooth mesh and Zigbee devices can upload data to the cloud and receive data from the cloud. In addition, a gateway supports the lighting, socket, and alarm functions.
Zigbee	Zigbee is a short-range, simple, low-power, low-data-rate, low-cost, and two-way wireless communication technology. It applies to short-range, low-power, and low-rate data transfer between various electronic devices, periodic data transfer, intermittent data transfer, and data transfer at a longer interval.
Z-Wave	Z-Wave is a wireless communication protocol developed by Zensys, a Danish company. Z-Wave Alliance members are smart home product manufacturers throughout the globe. Over 160 of them are world-renowned companies, and their product application scopes have almost covered all the countries and regions in the world.

Term	Description
NB-IoT	<p data-bbox="810 439 1374 947"> Narrowband Internet of Things (NB-IoT) is a cellular technology that limits the bandwidth to about 180 kHz. It can be used directly on a Global System for Mobile Communications (GSM), Universal Mobile Telecommunications System (UMTS), or Long Term Evolution (LTE) network to reduce the cost and enable a smooth upgrade. NB-IoT ensures long battery life and efficient connections of devices that have high network requirements. </p> <p data-bbox="810 976 1362 1350"> As an emerging technology in the IoT field, NB-IoT supports cellular data connection of low-power devices in Wide Area Network (WAN), which is also known as Low Power Wide Area Network (LPWAN). NB-IoT has four benefits including low power consumption, wide coverage, mass connection, and low cost. </p>

Term	Description
GPRS	General Packet Radio Service (GPRS) is a packet-oriented mobile data standard on the 2G and 3G cellular communication network's global system for mobile communications (GSM). Generally, GPRS is defined as a mobile communication technology specification that cannot directly transfer information such as email and software, but only transfers calls, time, and date. However, text messages can be executed in some specifications. It is usually called Personal Communication Service (PCS) in the United States.
LoRa	Long Range (LoRa) is a physical layer or wireless modulation to create long range WAN connections. LoRa technology is based on Chirp Spread Spectrum (CSS) modulation technology and supports a much longer communication range than traditional frequency-shift keying (FSK) technology. It features a long transmission distance and strong anti-interference capabilities. CSS has been widely used in military and space communications.

Term	Description
eMTC	Enhanced machine-type communication (eMTC) is an IoT technology based on the LTE protocol that supports mobility and fast locating. The cost of an eMTC chip is about 25% of that of an LTE Cat 1 chip, whereas the eMTC rate is four times the GPRS rate.
SIG	The Bluetooth Special Interest Group (Bluetooth SIG) is a Bluetooth standards organization. Only Bluetooth SIG certified devices can use the Bluetooth word mark and logo.
Bluetooth mesh	<p>Bluetooth mesh is a communication method that uses the mesh protocol based on classic Bluetooth.</p> <p>Bluetooth mesh devices do not have subordination relations, and they communicate with each other in broadcast mode. For example, when a mobile phone on a Bluetooth mesh network sends an instruction, all Bluetooth mesh devices within 10 meters away from the mobile phone can receive the instruction and send it to other devices within 10 meters away from them. In this way, the complete instruction can eventually reach the destination or cannot be received. No partial data loss occurs. Theoretically, Bluetooth mesh supports more devices on a network than Wi-Fi.</p>

Term	Description
Bluetooth mesh protocol	<p>The Bluetooth mesh protocol is a many-to-many (M2M) communication protocol based on Bluetooth. Devices that support the Bluetooth mesh protocol also support Bluetooth 4.0 and 5.0 protocols. Bluetooth mesh devices can communicate with other devices that support Bluetooth 4.0, such as mobile phones and computers.</p>

Mesh parameters

Transmission speed: 30 bytes/second.

Transmission distance: 10 meters for indoor transmission, and 30 meters for barrier-free transmission.

The number of devices in the network: More than 150 devices are allowed in the network. Theoretically, there can be 65,000 devices in the network.

Bluetooth technology: Standard Bluetooth mesh protocol, and Telink protocol based on Bluetooth 4.0 in a few cases.

NFC	<p>Near-field communication (NFC) is a new technology that enables two devices (such as mobile phones) that are geographically near each other to exchange data.</p>
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Term

 Description

NFC is rooted in radio-frequency identification (RFID) and interconnection technologies. An NFC chip has a contactless reader, contactless smart card, and point-to-point communication functions. NFC-enabled mobile terminals apply to scenarios such as mobile payment, e-ticketing, access control, mobile identity authentication, and anti-counterfeiting.

RFID

Radio-frequency identification (RFID) is a communication technology or electronic tag that is used to identify specific objects and read and write data through radio signals. The identifying system and identified objects do not need to establish mechanical or optical connections.

P2P

Peer-to-peer (P2P) networking is a distributed application architecture that partitions tasks or workloads between peers. P2P is a networking or network type that is formed by peer computational models at the application layer.

Term	Description
RTP	The Real-time Transport Protocol (RTP) is a network protocol for end-to-end (E2E) real-time data transmission. For example, delivering interactive audio and video or analog data over multicast or unicast networks. RTP is widely used in communication and entertainment systems that involve streaming media, such as telephone, video conferencing, television services, and web-based push-to-talk features.
Socket	A socket is an endpoint of a two-way communication link between two programs running on a network. A communication link involves at least two sockets, each of which is bound to a port number. In essence, a socket refers to an application programming interface (API) that is provided to programmers for network development during Transmission Control Protocol (TCP)/IP encapsulation. In this context, the Hypertext Transfer Protocol (HTTP) provides a specific form of data encapsulation or display, and the socket enables network communication.

Term	Description
MQTT	Message Queuing Telemetry Transport (MQTT) is a publish-subscribe-based messaging protocol that IBM has developed. MQTT supports all the platforms and can connect most IoT products to the external environment. It is used as a communication protocol for sensors and brakes.

1.3 Hardware

Term	Description
I/O pin and GPIO	Indicates the pins on the module, which is the input/output channel. GPIO refers to a general-purpose input/output pin.
Pin	A pin links the internal circuit of an integrated circuit (chip) to an external circuit. All pins of a chip form interfaces of the chip.
EP	An endpoint (EP) is a smart hardware device.
Control board	A control board is a circuit board. Its application scope is not as wide as that of the circuit board, but it is more smart and automatic than the general circuit board. Generally, only circuit boards with a control function are called control boards.

Term	Description
AC-DC power module	An AC-DC power module provides a constant current in the circuit, including dry cells, storage batteries, and DC generators.
Inductance	When an electric current flows through a conductor, it creates an electromagnetic field around that conductor. $\text{Electromagnetic field} \div \text{current} = \text{inductance}$. Formula: $L = \phi \div i$. The unit is henry (H). An inductor is typically used with a capacitor in an LC filtering circuit. Capacitors block DC while allowing AC to pass , whereas inductances block AC while allowing DC to pass .
LDO	A low-dropout linear regulator (LDO) is a DC linear voltage regulator that can regulate the output voltage even when the supply voltage is very close to the output voltage.
Development board	A development board is a circuit board that assists embedded system development.
PCB	A printed circuit board (PCB) mechanically supports and electrically connects electrical or electronic components using conductive tracks, pads, and other features etched from one or more sheet layers of copper laminated onto and/or between sheet layers of a non-conductive substrate.

Term	Description
PCBA/PCB'A	Printed circuit board assembly (PCBA) is the overall process of placing components onto a blank PCB using surface-mount technology (SMT), and then through-hole mounting dual in-line packages (DIPs) into the PCB. Developers in China usually use PCBA , whereas the standard spelling is PCB'A in Europe and America.
Antenna	An antenna is a hardware component that receives and transmits signals wirelessly, such as PCB antennas, helical antennas, ceramic chip antennas, FPC antennas with I-PEX connectors, and rod-shaped copper antennas.
Antenna gain	Antenna gain is the ratio of the power density of the actual antenna signal to the ideal radiation unit at the same point in space, given equal input power. Antenna gain quantitatively describes how well an antenna converts input power to radio waves headed in a specified direction.
Receiver sensitivity	Receiver sensitivity is a measure of the minimum signal level that the receiver can recover demodulation. This value is a negative number. The smaller the value, the better the receiver performance.
Country code	The power limit and spectrum planning requirements for all the countries and regions.

Term	Description
TRP	The total radiated power (TRP) in the OTA test, including the horizontal and vertical parts.
TIS	Total isotropic sensitivity (TIS) in OTA test, including horizontal and vertical parts.
EVM	The error vector magnitude (EVM) is used to measure the accuracy of digital modulation.

2 Embedded development

Term	Description
MCU	A microcontroller unit (MCU) is a small computer on a single integrated circuit, with very high integration, rich functions, very high response speed, reliability, and a wide application field. Devices with the MCU have their own control boards, which define the product functions. Network modules connect to control boards to implement the network connection.
SDK	A software development kit (SDK) contains the documents, examples, and tools required to develop software. Tuya provides free SDKs to encourage developers to use their systems or languages.

Term	Description
Firmware	Firmware refers to programs written into the erasable programmable read-only memory (EROM) or electrically erasable programmable read-only memory (EEPROM). The firmware drives programs embedded in devices, for example, CD-ROM and CD-R. The firmware enables operating systems to drive devices based on standard device drivers. The firmware is the software that completes the most basic bottom-layer tasks of a system.
OTA	Over-the-air (OTA) update is a firmware update method provided by Tuya. Firmware updates can be wireless or wired. Firmware over-the-air (FOTA) is a wireless update method.
Serial port	A serial port, also known as a serial communications port (generally referred to as a COM port), is an extended port that uses the serial communication mode. A serial port transfers one bit at a time. It features simple communication paths. A pair of transmission cables, for example, a pair of telephone lines, can enable two-way communications between two serial ports, greatly reducing communications costs. Serial ports specifically focus on long-range communication but with a low transmission speed.

Term	Description
UART	A universal asynchronous receiver/transmitter (UART) is a computer hardware device that converts parallel input signals to serial output signals. A UART is usually integrated into other communication interface devices, such as independent modular chips or peripherals integrated into microprocessors.
Serial communication protocol	Serial communication protocol enables a serial port to transmit and receive data on a per-bit basis. Although serial communication is slower than parallel communication in which data is exchanged by byte, a serial port can use one link to send data, and another link to receive data at the same time. Common serial communication protocols include RS-232, RS-422, and RS-485.
RTC	A real-time clock (RTC) is a device that is independent of the system timer. It is used to set the system clock and provide an alarm or periodic timer.

Term	Description
Arduino	<p>Arduino is one of the most popular open-source hardware products in the world, an excellent hardware development platform, and the trend of hardware development. With simple development, Arduino enables developers to pay more attention to creative ideas and implementation, complete their project development more quickly, reduce learning costs, and shorten development cycles.</p>
No-code development solution	<p>Also known as a development-free solution. It allows developers to develop embedded programs quickly without coding. All the functions of the firmware can be configured online on the Tuya IoT Platform. Developers only need to complete the hardware and appearance design to achieve mass production.</p>
Module debugging assistant	<p>Tuya module debugging assistant is a serial port debugging tool that integrates the communication protocol of Tuya modules. With diversified functions and convenient use, it is used for debugging during development with general MCU integration solutions. It integrates common protocols of Tuya modules, including Wi-Fi, Bluetooth, Zigbee, and NB-IoT. It can simulate the module to verify the MCU code logic and simulate the MCU to debug the pairing function.</p>

Term	Description
Firmware identifier	The firmware name used for firmware compilation, generally following naming principles.
Firmware configuration	It is mostly used for firmware parameter configuration in no-code hardware development, which can be written to the module by a flashing tool.
Firmware key	The unique code number generated after the firmware is uploaded to the Tuya IoT Platform. It is 16 bytes by default, and 8 bytes by default for Bluetooth and Zigbee protocols.
Cool white light (C)	A cool white lighting product (C light) emits cool white light with adjustable brightness.
Cool and warm white light (CW)	A cool and warm lighting product (CW light) emits cool and warm white light with adjustable brightness and color temperatures.
Colored light (RGB)	<p>The red, green, and blue (RGB) color model is an industry-standard color model in which red light, green light, and blue light overlay in various ways to reproduce a broad array of colors.</p> <p>An RGB lighting product has adjustable light colors.</p> <p>The model can reproduce almost all colors that the human eye can perceive, and it is one of the most widely used color models.</p>

Term	Description
	<p>An RGB value refers to brightness, which is represented with an integer. Each of the red, green, and blue color channels has values of 0 to 255. An RGB system can have 16,777,216 ($256 \times 256 \times 256 = 16777216$) possible colors. The RGB system is also called 16 million colors or 24-bit colors (224).</p>
Cool white and colored light (RGBC)	<p>An RGBC lighting product has adjustable light colors and brightness. RGBC stands for red, green, blue, and cool white.</p>
White and colored light (RGBCW)	<p>An RGBCW lighting product has adjustable light colors, brightness, and color temperatures. RGBCW stands for red, green, blue, cool white, and warm white.</p>

3 Cloud development

3.1 Cloud Development Platform

Term	Definition
<code>accessId</code> and <code>accessKey</code>	<p>It is also called a cloud application key pair. After a cloud application is created in the cloud development section of the Tuya IoT Platform, <code>accessId</code> and <code>accessKey</code> are generated by default in the background. They are used for authorization and authentication of API operations.</p>

Term	Definition
Standardization	Standardization means that in the process of product connection, regarding repetitive control protocols and concepts, combined with categories, Tuya IoT Cloud has unified the Things Data Model, and formulated unified control protocols. Through one product connection on the Tuya IoT Platform, developers can control products of multiple models in the same category. In this way, reduce the complicated workload caused by repeated connection, thereby improving efficiency.
Instruction set	One or more sets of control instructions used to control the devices. It is distinguished by product categories. The instruction set under the same category includes the instruction set collections under different PIDs of the category. That is, the instruction set of the PID is a subset of the instruction set of the category.

Term	Definition
Status set	<p>A collection used to describe the function status reported by the device. It is the same as the instruction set and is distinguished by product categories. The status set under the same category includes the status set collections under different PIDs of the category. That is, the status set of the PID is a subset of the status set of the category. Note: There is no strict one-to-one correspondence between the instruction set and the status set. Developers can use the instruction set or status set as needed based on the sending and reporting scenarios.</p>
Schema	<p>The unique identifier of an app, used for user data isolation on the Tuya Cloud Development Platform. It is used in scenarios such as synchronizing users and querying users during the connection.</p>
Alert message	<p>When messages backlog in a third-party service, according to the alert parameters set by the developer in the Tuya Cloud Development Platform, Tuya will send alert messages to the developer's registered mobile phone and email address, and remind third-party services to solve the problem.</p>

Term	Definition
Message service	Message service is a function that Tuya provides for third-party services to receive device messages. It allows third-party services to receive messages from smart devices connected to the Tuya IoT Platform.
Message backlog	When a third-party service is slow in processing messages and fails to consume timely due to program performance and other reasons, the messages pushed by the device will be backlogged in the Tuya IoT Platform, waiting for the third-party service to consume and process.
IoT WeChat Mini Program app ID	IoT WeChat Mini Program app ID refers to a string of characters created by Tencent WeChat official development platform for each WeChat mini program. It is the unique identifier of a specified WeChat mini program.
IoT WeChat Mini Program app secret	IoT WeChat Mini Program app secret is an access key created by Tencent WeChat official development platform for each WeChat mini program. When the Tuya cloud development service communicates with the WeChat server, the app secret is required for permission verification.
API grouping	API grouping is to group multiple APIs with common features. Usually, an API is grouped according to the functional modules to which the API belongs.

3.2 Common terms

Term	Description
OAuth 2.0	<p>OAuth (Open Authorization) is a development standard that allows users to authorize third-party applications to access or control assets such as devices and scene data of the user on the Tuya IoT Cloud, without providing a username and password. Examples of application scenarios for different objects are as follows:</p> <p>Consumer: A user of the Tuya Smart app authorizes third-party cloud voice assistant platforms, such as Amazon Alexa and Google Home, to control the devices under the account.</p> <p>Business: Based on the cloud application key issued by Tuya, the developer gets or controls data of users, devices, products, apps, and more, without entering a username and password.</p>
Simple mode	<p>Simple mode is one of the authorization modes in the OAuth 2.0 protocol specification. It is also known as the Client Credentials Grant. The client accesses the API based on the Tuya API specification. After Tuya's authentication server completes the authentication, it can issue an access token.</p>

Term	Description
Authorization code mode	Authorization code mode is one of the authorization modes in the OAuth 2.0 protocol specification. It is also known as the authorization code grant mode. The client uses the authorization code to exchange access tokens, and thus gains access to user data.
access_token	An access token, also called authentication credential, must be provided when calling Tuya Cloud Open API. Only after you complete the authentication by Tuya's authentication server, can relevant business operations be carried out.
refresh_token	Refresh token. When the access token becomes invalid, a new access token can be obtained through the refresh token that can be used only once.
API	Application programming interface (API) refers to pre-defined functions or conventions to connect different components of a software system. An API is used to provide a set of routines (a collection of functional APIs or services) that applications and developers can access based on certain software or hardware, without having to access the original code or understand the details of the internal working mechanism.

Term	Description
RESTful	RESTful is a design style and development method for web applications. Based on HTTP, it can be defined in XML format or JSON format. RESTful is suitable for scenarios where mobile internet service providers use it as business enabling APIs, so third parties can use mobile network resources in the way of over the top (OTT). The action types include adding, changing, and deleting the called resources. Tuya IoT Cloud provides API services to external developers with RESTful APIs.
Message queue	The message queue refers to the container in which messages are stored during transmission.
Pulsar	Pulsar is a multi-tenant, high-performance server-to-server messaging solution. Originally developed by Yahoo, it is now managed by The Apache Software Foundation. Tuya has made customized improvements based on the open-source Pulsar system. Tuya actively pushes various event data to external partners through Pulsar. Pulsar SDK provided by Tuya can complete message access and meet the requirements of partners for real-time messaging and message persistence.

Term	Description
NLP	Natural language processing (NLP) is a subfield of artificial intelligence (AI) concerned with the interactions between computers and human (natural) languages, in particular how to program computers to process and analyze large amounts of natural language data.
SaaS	Software as a Service (SaaS) is a software distribution model in which a service provider hosts applications based on cloud computing infrastructure and makes them available to customers on clients, for example, browsers. Users do not need to manage or control the cloud computing infrastructure, including the networks, servers, operating systems, and storage. All the cloud computing infrastructure is managed and operated by SaaS providers.

Term	Description
PaaS	<p>Platform as a service (PaaS) is a cloud computing model in which the applications are developed or procured by customers through Java, Python, and .NET development languages, and service providers deploy the applications on the cloud computing infrastructure. Customers can control the deployed applications and configure the hosted environment where the applications run. They do not need to manage or control the underlying cloud infrastructure, including the networks, servers, operating systems, and storage.</p>
IaaS	<p>Infrastructure as a service (IaaS) is a service model in which customers can use all computing infrastructure resources, including the CPU, memory, storage, network, image, firewall, and other computing resources, to deploy and run any software, including operating systems and applications.</p>
GDPR	<p>The General Data Protection Regulation (GDPR) is a European Union (EU) regulation on data protection and privacy for all individuals within the EU and the European Economic Area (EEA). It has high requirements for data protection, security, and standards compliance.</p>

Term	Description
SSID	A service set identifier (SSID) divides a wireless local area network (WLAN) into several subnetworks that need independent identity verification. Only authenticated users can access the WLAN, preventing unauthorized access and ensuring network security.
AP isolation	A computer mode. As a computer mode, AP isolation is used to isolate connected PCs, ensuring user data security.
PB	The petabyte (PB) is a storage unit. One petabyte is equal to 1024 terabytes (TB).
PID	Product ID. Each product created on the Tuya IoT Platform has a unique product ID (PID). The PID is associated with the product information, including the data points (DPs), app control panel, and shipment information. If a product is compared to a person, the PID is its identity card.
UUID	A universally unique identifier (UUID) is the unique ID when you develop a smart product on the Tuya IoT Platform. Authkey is the authentication key to register the device to the cloud, and UUID has a one-to-one mapping to the Authkey. A UUID is a 20-character string, and an Authkey is a 32-character string.

Term	Description
API	Application programming interfaces (APIs) are predefined functions that enable application programs and developers to access the library based on software or hardware, without accessing the source code or understanding details about the internal operating mechanism.
Cloud API	Cloud APIs enable developers to use a cloud application programming interface that has a service delivered by cloud service providers.

4 App

Term	Description
All-in-one apps	Tuya provides all-in-one apps that have the features of being free, immediate use, easy control, diversified scenarios, useful functions, and world readiness. All-in-one apps include the Tuya Smart app and Smart Life app.
OEM app	Tuya provides one-stop branded OEM app building and management services. You can customize an app consistent with your brand guideline based on our standard templates. With app version management, app data operation, and other management services, you can quickly bring products to market.

Term	Description
Tap-to-run (scene)	Tap-to-run is a set of cloud-based preset actions including device operation and delay. The tap-to-run actions can be executed remotely.
Automation (scene)	Set trigger conditions for tap-to-run scenes. For example, the conditions can be time, device status, geographic location, and weather.
Group	A group refers to the grouping of devices of the same type in a home, which can be controlled together.
IoT App SDK	IoT App SDK is a set of SDKs launched by Tuya for the smart home field. App developers can quickly complete app functionality development based on the SDK, and implement operations for the smart devices on the app, including device pairing, device control, firmware updates, timing tasks, and smart scene creation.
Extension SDK	The Extension SDK includes IPC SDK, door lock SDK, and sweeper SDK. They encapsulate specified functions for the vertical resources, facilitating the development of products in vertical fields.

Term	Description
AP pairing	Also known as hotspot mode or access point (AP) pairing. It is a connection capability for pairing through Wi-Fi. After a mobile phone is connected to the Wi-Fi hotspot of the device to be paired, the app and the mobile phone directly communicate and pair with each other through Wi-Fi. With a high success rate and good reliability, it adapts to 2.4 GHz and 5 GHz dual-band routers. However, users need to manually switch the Wi-Fi band that the mobile phone is connected to.
Wi-Fi Easy Connect	Also known as Easy Connect, SmartConfig, or EZ pairing. It is a connection capability for pairing through Wi-Fi. After the user connects the mobile phone to the router, the router broadcasting is used to communicate and pair with the device. It is easy-to-use, but has compatibility requirements for mobile phones and routers. The success rate is lower than that of AP pairing .

Term	Description
Pairing through gateway	<p>The gateway is divided into the Zigbee gateway and Bluetooth gateway. If the gateway is controlled, all the sub-devices of the gateway can be controlled. Regarding the connection method, it includes the wired gateway and wireless gateway. For the wired gateway, the device is paired through wired connections. For the wireless gateway, the device is paired through Wi-Fi Easy Connect.</p>
Control panel	<p>A control panel refers to a type of program which runs on a Tuya all-in-one app, OEM app, or an app based on IoT App SDK. It is used to control the 'Powered by Tuya' smart products. Built with the React Native framework, the control panel supports dynamic updates and keeps the smooth experience of native apps to the maximum extent possible.</p>
UI BizBundle	<p>Tuya provides development-free UI BizBundles based on the IoT App SDK, encapsulating specific business logic and UI. You can implement full functionality by calling APIs, helping to relieve you from heavy development work. Common UI BizBundles include device control UI BizBundles and smart scene UI BizBundles.</p>
Panel SDK	<p>Panel SDK is a set of methods in the panel container to call app modules and the tool methods encapsulated in the panel.</p>

Term	Description
Real device	A real device is a device that has an integrated network module and completed firmware logic processing.
Virtual device	A virtual device is a non-real device for you to experience panels and devices that display product functional logic.
UIID	UIID refers to the ID of the control panel of a smart product. That is, the unique identifier of the UI package generated after the panel project is developed and uploaded.
All-in-one panel	An all-in-one panel refers to a series of general panels opened on the Tuya IoT Platform for quick use and empowerment of smart products.

5 Third-party connection

Term	Description
WWA	Works with Alexa (WWA) certification is a paid service that Amazon provides to test, verify, and certify products of the partners based on its standards.

Term	Description
Amazon Echo	Amazon Echo is a brand of smart speakers that Amazon has developed. Amazon Echo has three versions, including a basic Echo Dot, a standard Amazon Echo, and a portable Amazon Tap. Similar to common Bluetooth speakers, the Echo speakers do not have a screen and only support the voice interaction mode.
Amazon Alexa	Amazon Alexa is a cloud-based voice service. Amazon Alexa-enabled Echo speakers allow you to use voice commands to interact with smart devices and acquire related services, including playing music, answers to questions, and setting alarms. At present, Alexa only supports the English language. Alexa serves as the brain of the Echo. All input and output messages are processed by Alexa.
Alexa Skill	Alexa Skills are third-party services of Alexa.
IFTTT	If This Then That (IFTTT) is a free web-based service platform that allows you to create chains of simple conditional statements for easier use. IFTTT consists of three parts, including tasks, triggers, and actions.
Google Home	Google Home is a brand of smart voice-activated home speakers.

Term	Description
Google Assistant	Google Assistant is an AI voice assistant that supports multiple languages and devices. It activates the audio interactions with Google Home speakers.
Google Action	Google Action is a development platform for Google Assistant. It allows the third-party development of actions—applets for the Google Assistant that provide extended functionality.
Google Mini	Google Mini is a Google Search appliance designed for businesses to set up a search engine.
HomeKit	HomeKit is a smart home platform that Apple launched in 2014. HomeKit regards your home as a collection of smart home appliances and allows you to manage smart home appliances based on homes, rooms, and zones. HomeKit supports common smart home protocols and secure pairing. It provides an open API for pairing and interconnections with smart home appliances, so you can use Siri to control smart home appliances.

Term	Description
Home Assistant	Home Assistant is a Python-based open-source smart home system. It supports smart home devices of multiple brands, ensuring easy voice control and automation of devices. Home Assistant is intended primarily for individual developers or users, and is not commercially available.

6 Others

Term	Description
OEM	An original equipment manufacturer (OEM) is a company that produces parts and equipment that may be marketed by another manufacturer.
ODM	An original design manufacturer (ODM) is a company that designs and manufactures a product, as specified, that is eventually rebranded by another firm for sale. Alternatively, the design is modified slightly for production. The manufacturer that designs and manufactures products is called ODM, and the products are ODM products.
OBM	An original brand manufacturer (OBM) is typically a company that sells an entire product made by a second company or including a component from a second company sources as its own branded product.

Term	Description
MOQ	A minimum order quantity (MOQ) is the smallest number of products that you can order at a time.
AI	Artificial intelligence (AI) is a new technology science for researching and developing the theories, methods, technologies, and application systems to mimic, extend, and expand human intelligence. AI research includes robotics, speech recognition, image recognition, natural language processing, and expert systems.
AIoT	Artificial Intelligence of Things (AIoT) combines AI and IoT. AIoT can achieve more efficient IoT operations, improve human-computer interaction, and enhance data management and analytics.
