



# Terms

Introduction of Tuya

Version: 20200108



## Contents



This topic lists terms and definitions about the Tuya Smart platform. Read this topic if you encounter terms difficult to understand during the development process.

Hardware-  
related

Term Definition

**Device** A device can be used long-term with its original form and functions unchanged. Generally, it refers to products.

**C (light)** A C lighting product produces white light with adjustable brightness.

**CW (light)** A CW lighting product produces white light with adjustable brightness and color temperatures.

**RGB (light)** An RGB lighting product has adjustable light colors. 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. The model can reproduce almost all colors that the human eye can perceive. It is one of the most widely used color models. Each of the red, green, and blue color channels has values of 0 to 255, indicating grayscale levels. An RGB system can have 16,777,216 (256<sup>3</sup>) possible colors. The RGB system is also called RGB24 (24-bit mode).

**RGBC (light)** An RGBC lighting product has adjustable light colors and brightness. RGBC stands for red, green, blue, and cold white.

**RGBCW (light)** An RGBCW lighting product has adjustable light colors, brightness, and color temperatures. RGBCW stands for red, green, blue, cold white, and warm white.

**HSV** Hue, saturation, and value (HSV) is a color model designed to align with the way human vision perceives color attributes.

**IPC** An Internet Protocol camera (IPC) is a next-generation camera that uses network technologies.

**AC-DC power module** An AC-DC power module provides a constant current in the circuit. AC-DC power modules include dry cells, storage batteries, and DC generators.

Hardware-  
related

Term Definition

**SoC** A system on chip (SoC) device does not have a microcontroller unit (MCU). The control programs are written into the module.

**I/O pin or GPIO** Pins on a general-purpose input/output (GPIO) are input/output channels.

**OSD** An on-screen display (OSD) is an on-screen menu for adjusting the display. This menu, typically activated by pressing the Menu button, allows you to view and/or adjust working options of the display, such as the color, mode, and shape, to achieve optimal display status.

**Gateway** A gateway has both Bluetooth communication and network connection capabilities to connect Bluetooth mesh devices that cannot directly access the network. Through the gateway, local Bluetooth mesh devices can send and receive data to and from the cloud. In addition, a gateway supports the lighting, socket, and alarm functions.

**ZigBee** ZigBee is a simple, low-cost, low-power, low data rate, and short-range 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.

**NB-IoT** Narrowband Internet of Things (NB-IoT) is a cellular technology that limits the bandwidth to 180 kHz. It can be used directly on a GSM, UMTS, or LTE network to reduce the cost and enable smooth upgrade. NB-IoT ensures long battery life and efficient connections of devices that have high network requirements.

Hardware-  
related

Term Definition

**LoRa** Long Range (LoRa) is a spread spectrum modulation technique derived from chirp spread spectrum (CSS) technology. It supports a much longer communication range than traditional frequency-shift keying (FSK). Over the past decades, CSS has been used widely in military and space communications. It features long transmission distance and strong anti-interference capabilities.

**eMTC** Enhanced machine-type communication (eMTC) is an IoT technology based on the LTE protocol that supports mobility and locating. The cost of an eMTC chip is about 25% of that of a Cat 1 chip, whereas the eMTC rate is four times the GPRS rate.

**Bluetooth mesh** Bluetooth mesh is a communication method that uses the mesh protocol based on traditional Bluetooth. Bluetooth mesh devices communicate with each other in broadcast mode. For example, after a mobile phone on a Bluetooth mesh network sends an instruction, all Bluetooth mesh devices within 10 m from the mobile phone can receive the instruction and send it to other devices within 10 m from them. In this way, the complete instruction can eventually reach the destination, and no data loss will occur. Theoretically, Bluetooth mesh supports more devices on a network than Wi-Fi.

**Bluetooth mesh** 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 and can communicate with other devices that support Bluetooth 4.0, such as mobile phones and computers.

**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.

Hardware-  
related

Term Definition

Mesh Transmission rate: 30 byte/s Transmission distance: 10 m (indoor); 30 m  
net- (no barriers) Number of devices on a mesh network:  $\geq 150$  (theoretically  
work- 65,000) Bluetooth technologies in use: Bluetooth 4.0-based Telink and  
ing standard Bluetooth mesh protocols  
spec-  
ifi-  
ca-  
tions

NFC 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. 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.

P2P Peer-to-peer (P2P) computing or networking is a distributed application  
architecture that partitions tasks or workloads between peers at the  
application layer.

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 simulated data over multicast or unicast  
networks. RTP is used widely in communication and entertainment  
systems that involve streaming media, such as telephony, video  
conferencing, television services, and web-based push-to-talk features.

Hardware-  
related

Term Definition

**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 practice, 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.

**MQTT** Message Queuing Telemetry Transport (MQTT) is a publish-subscribe-based messaging protocol that IBM has developed. It may become an important part of the Internet of Things (IoT). MQTT supports all platforms and can connect most IoT products to the external environment. It is used as a communication protocol for sensors and brakes, for example, connecting houses through Twitter.

**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 in microprocessors.

**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.

**Inductance** When an electric current flows through a conductor, it creates a magnetic field around that conductor. Inductance (unit: H) is the ratio of the magnetic flux to the current. An inductor is typically used with a capacitor in an LC circuit. Inductors block AC while allowing DC to pass, whereas capacitors block DC while allowing AC to pass.

**LDO** Low dropout regulator

Hardware-  
related

Term Definition

**Module** A module is integrated to an embedded electronic system to connect the system to a network (such as the Internet or Ethernet). Currently, Tuya provides Wi-Fi modules, GPRS modules, and Bluetooth mesh modules, which are used for network connections in different modes.

**Onboard antenna** An onboard antenna is a part of a PCB that receives and transmits wireless signals.

**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.

**Demo board** A demo board is a circuit board that assists embedded system development.

**Hardware** Hardware refers to physical components and devices that you can see and touch. Generally, it refers to products.

**PCB** Printed circuit board

**PCBA** 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.

**Data point** A data point (DP) represents a smart device function. DPs are of different data types — for example, Boolean, enum, and numerical — and have read and write attributes. For example, a 2-way switch has two Boolean DPs, and each DP has either a true or false value, which is readable and writable.

**Pin** A pin links the internal circuit of an integrated circuit (chip) to an external circuit. All pins of a chip form the chip's interfaces.

**EP** An endpoint (EP) is a smart device.



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Hardware-  
related

Term Definition

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**NB-IoT** Narrowband Internet of Things (NB-IoT) is a new, important IoT technology used to build the cellular network of low-power devices over a Wide Area Network (WAN), which is called a low-power wide-area network (LPWAN). NB-IoT occupies a channel bandwidth of only 180 kHz and can be used directly on GSM, UMTS, or LTE networks to reduce cost and enable smooth upgrade. NB-IoT features low power, wide coverage, high connection density, and low cost.

**Contr board** A control board is a smart, automatic circuit board. Generally, only circuit boards with a control function are control boards.

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Cloud-  
related

TermDefinition

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**NLP** Natural language processing (NLP) is an AI subfield.

**SaaS** Software as a service (SaaS) is a software distribution model in which a third-party provider hosts applications based on cloud computing infrastructure and makes them available to customers on clients, for example, browsers. Customers do not need to manage or control the cloud computing infrastructure, including the networks, servers, operating systems, and storage.

**PaaS** Platform as a service (PaaS) is a cloud computing model in which a third-party provider delivers a platform that contains development languages, tools (such as Java, Python, and Net), and open-source applications available to customers over the Internet. Customers can control deployed applications and configure the hosted environment where the applications run. They do not need to manage or control the bottom-layer cloud infrastructure, including the networks, servers, operating systems, and storage.

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Cloud-  
related  
TermDefinition

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IaaS Infrastructure as a service (IaaS) is a service model in which customers can use all computing infrastructure resources, including the CPU, memory, storage, network, and other computing resources, to deploy and run any software, including operating systems and applications.

GDPR 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.

SSID A service set identifier (SSID) uniquely names a wireless local area network (WLAN) that needs independent identity verification. Only authenticated users can access the WLAN, preventing unauthorized access and ensuring network security.

AP isolation 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 Each product created on the Tuya Smart platform has a unique product ID (PID), which associates the product information, including the DPs, App control panel, and shipment information.

UUID A universally unique identifier (UUID) is a device's SDK license. It has a one-to-one mapping to the device's authkey, which is required to register the device to the cloud. A UUID contains 20 bits, and an authkey contains 32 bits.

API Application programming interfaces (APIs) are predefined functions that provide application programs and capabilities for developers to access routines based on software or hardware without accessing the source code or understanding details about the internal operating mechanism.

Cloud-  
related  
TermDefinition

CloudCloud APIs enable developers to develop application programs and  
API services for provisioning cloud hardware, software, and platforms.

Third-  
Party  
Interworking-  
related  
Term Definition

WWA Works with Alexa (WWA) certification is a paid service that Amazon provides to test, verify, and certify partners' products based on its standards. WWA certification is also called NAC certification.

IFTTT If This Then That (IFTTT) is a free web-based service that allows you to create chains of simple conditional statements for easier use. IFTTT involves three parts: tasks, triggers, and actions.

Actions on Google Actions on Google is a developer platform that lets you create software to extend the functionality of Google Assistant.  
Google

Google Assistant Google Assistant is an AI voice assistant that Google has developed. It supports multiple languages and devices. It activates the Google Home speakers' voice interactivity.

Google Mini Google Mini is a Google Search Appliance designed for businesses to set up a search engine.

Google Home Google Home is a brand of smart voice-activated home speakers that Google has developed.

Third-  
Party  
Interworking-  
related  
Term      Definition

**Amazon Echo** Amazon Echo is a brand of smart speakers that Amazon has developed. Amazon Echo has three versions: basic Echo Dot, standard Amazon Echo, and portable Amazon Tap. Similar to common Bluetooth speakers, the Echo speakers do not have a screen and only support the voice interaction mode. The embedded Alexa processes all input and output information. You can use simple voice instructions to control the Echo speakers to complete various tasks.

**Amazon Alexa** Alexa is Amazon's 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. Alexa only supports the English language.

**Alexa Skills** Alexa Skills are Alexa third-party services.

**HomeKit** HomeKit is a smart home platform that Apple launched in 2014. It 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 mainstream smart home products and allows you to use Siri to control your smart home appliances.

**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 enthusiasts, and is not commercially available.

Embedded

Product-

related

Term Definition

**MCU** Devices with a microcontroller unit (MCU) have their own control boards, which define the product functions. Modules connect to control boards to implement connection functions.

**SDK** A software development kit (SDK) contains the documents, examples, and tools required to develop software. Many vendors provide free SDKs to encourage developers to use their systems or languages. So does Tuya.

**Firmware** Firmware refers to programs written into the erasable read-only memory (EROM) or electrically erasable programmable read-only memory (EEPROM). Firmware drives programs embedded in devices, for example, CD-ROM and CD-R. Firmware enables operating systems to drive devices based on standard device drivers. Firmware is software that completes the most basic bottom-layer tasks of a system.

**OTA** Over-the-air (OTA) upgrade is a firmware upgrade method, which Tuya supports. Firmware upgrades can be wireless or wired. Firmware OTA (FOTA) is a wireless upgrade 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 communications 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 slow transmission speed.

### Embedded

### Product- related

### Term Definition

**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 and another 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.

### Other

### TermsDefinition

**OEM** Original equipment manufacturer

**ODM** An original design manufacturer (ODM) designs and manufactures specified products that are eventually branded by another firm for sale. Products manufactured by the ODM are ODM products.

**AI** Artificial intelligence (AI) is a theory, method, technology, and new science for researching and developing human intelligence simulation, extension, and applications. AI research includes robotics, language identification, image recognition, natural language processing, and expert systems.

**Control panel** A control panel is a UI that provides the control function. Generally, it refers to the control panel in an app.

**MOQ** A minimum order quantity (MOQ) is the smallest number of products that you can order at a time.