# GSM/GPRS/3G/4G/NB-IoT/LoRa Sensor To Cloud IoT Series



Transmits Sensor/Meter signal to Cloud Platform;
Ultra-Low Power consumption, small size, easy operation;
PCBA, Metalical Enclosure, Waterproof Enclosure;
Supports DIN/Relay Output/AIN/DS18B20/AM2301/RS485;
Supports GSM/GPRS/3G/4G/NB-IoT/Lora;
Supports Cloud Platform, Modbus TCP, MQTT, SMS, Dial Alert.

**Sensor to Cloud IoT Series**



## Sensor To Cloud

## Data Sheet

Version：1.0

Model：IOT10xyz

Date：2019-02-22

**[Preface]**

Thank you for using the Sensor To Cloud IoT Series device of King Pigeon Hi-Tech. Co., Ltd. Reading this product description allows you to quickly grasp the function and use of this product.

**[Copyright statement]**

The ownership of this specification is owned by King Pigeon Hi-Tech. Co., Ltd. Without the written permission of the company, no unit or individual has the right to reproduce, disseminate and copy any part of the manual in any form, otherwise the offender will be at his own risk.

**[Disclaimer]**

The company cannot provide free upgrade services if the Device cannot continue to be used because of the network upgrade of the operator. The company will not bear the consequences if the Device is unable to work properly due to the interruption of the network services of the operators.

This product is mainly based on GSM/3G/4G network, please use it according to the parameters and technical specifications provided in the specification, and please pay attention to the radio products, especially GSM/3G/4G. The company does not bear property or personal injury caused by improper use of the product.

**[Document revision record]**

| Date | Version | Revised instructions |
|---|---|---|
| 2019-02-22 | V1.0 | The first version |
|  |  |  |
|  |  |  |

**[Device selection table]**

| IOT10 | x (I/O type) | y (communication) | z (communication protocol) |
|---|---|---|---|
| Fixed | R (DO: Digital Output-Open Collector)<br>D (DIN: Digital Input)<br>A (AIN: 4~20mA Analog Input)<br>V (AIN: 0~5V Analog Input)<br>B (DS18B20 Temperature Sensor Input)<br>M (AM2301 Temperature & Humidity Sensor Input)<br>U (RS485 Transparent Transmission) | G (GSM/GPRS)<br>W (3G)<br>L (4G LTE)<br>N (NB-IoT)<br>R (LoRa)<br>E (Ethernet) | T（Modbus RTU Over TCP）<br>M (MQTT) |

Note: RS485 serial port type communication protocol is data transparent transmission, and the last digit of its model is fixed to T.

IOTa0xyz model definition:

a represents the number of I/O channels: = 1 represents one I/O channel , = 2 represents two I/O channels;

x stands for I/O type: = R stands for DO, = D stands for DIN, = A stands for 4~20mA, = V stands for 0~5V, = B stands for DS18B20, =M stands for AM2301 , = U stands for UART RS485;

y means of communication: = G means GSM/GPRS, = W means 3G, = L means 4G LTE, = N means of NB-IoT, = R means of LoRa, = E means Ethernet;

z for communication protocol: = T for Modbus RTU over TCP, = M for MQTT;

For example, model IOT10RWM indicates that the product is a DO output type, 3G communication mode, MQTT communication protocol.

# 1. Brief Introduction

The Sensor To Cloud IoT Series include DO - Digital Output (Open Collector), DIN - Digital Input, AIN - 4~20mA Analog Input, AIN – 0~5V Analog Input , DS18B20 Temperature Sensor Input, AM2301 Temperature & Humidity Sensor Input, RS485 Transparent Transmission etc. I/O types of different functions, optional GSM, GPRS, 3G, 4G, NB-IoT, Lora, Ethernet, etc. communication methods, support for Modbus RTU Over TCP and MQTT communication protocols or data transparent transmission, with a combination of up to dozens of models, covering most of the applications to meet the different needs of users.

This product is compact and exquisite, powerful, and can choose the regular online working mode or ultra low power working mode according to the need. It can choose the waterproof plastic shell for industrial metal shell or outdoor use, acting as a complete finished product connection sensor monitors data collection, remote control and abnormal warning notifications through SMS, phone, network, wechat, web end and cloud platform. It can also be used as a PCBA module embedded in a third-party motherboard for secondary development, to facilitate the traditional sensors, instruments and other rapid access to objects such as networking.

# 2. Safety Note

**Safety tips**

Please do not use this product in places where it is forbidden to use mobile phones!

**Wireless interference**

This product uses GSM/3G/4G wireless network, please pay attention to wireless interference!

# 3. Packing List

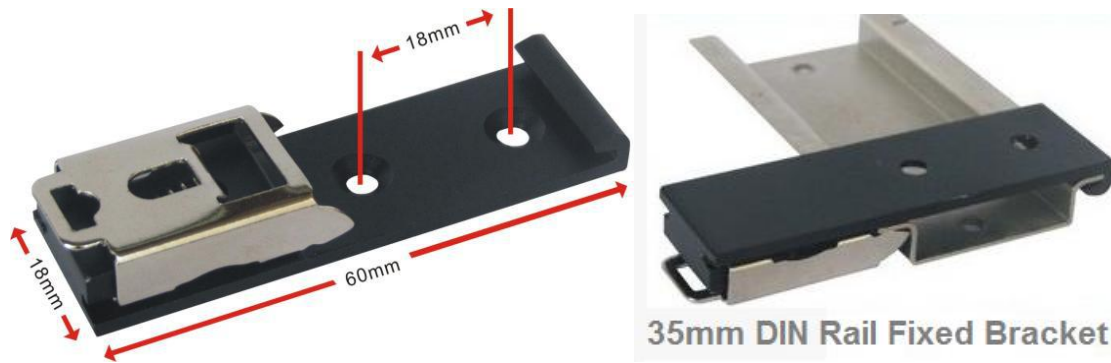RTU x1, GSM/3G/4G antenna x1, specification (CD) x1, power adapter (DC 12V1.5A) x1

Note: SIM cards are not included in the list.

**Optional Accessory:**

DS18B20 temperature detector, length: 1m, 5m, 10m, 20m

AM2301 temperature and humidity detector, length: 1m, 5m, 20m

DIN 35mm rail fixed support:

35mm DIN Rail Fixed Bracket

# 4. Functional Characteristics

➢ It can be used as a complete product or as a secondary development of the PCBA module.

➢ Two modes of work are optional:

Normal mode: data transmission in real time, so that users can understand the situation on the spot in a timely manner;

Low power mode: ultra low power source design (less than 230uA), suitable for the periodic collection of recorded data sites;

➢ A variety of communication options are available: GSM, GPRS, 3G, 4G, NB-IoT, LoRa, Ethernet, etc.

➢ Diversified functions: switch control, digital input monitoring, analog input monitoring, temperature and humidity monitoring, RS485 serial communication, etc.

➢ Support for setting parameters through SMS, computer configuration software, cloud platform(change the configuration and viewing real-time data);

➢ Supports 10 user numbers, each of which can be set up separately to receive specific alarm messages and alarm calls;

➢ Support 10 timer task: Inbuilt inter-lock logic programmer and powerful timer program function

➢ Supports 2 different server centers that can set IP addresses or domain names;

➢ Support for Modbus RTU Over TCP protocol and MQTT protocol or data transparent transmission;

➢ Resend mechanism To ensure that each data is effectively uploaded to the server;

➢ 32M-bit storage to save historical data.

➢ Wide working voltage design, support 7~24 VDC power supply, with anti-reverse connection protection;

➢ Built-in clock chips and super capacitors to ensure long-term timing after power outages;

➢ Use the nano SIM card to support pin code verification and ensure the security of the card;

➢ The optional metal shell or waterproof shell, can be installed and used in the house and outdoors.

# 5. Technical parameters

| Item | Parameter range |
|------|-----------------|

| | |
|---|---|
| **Working voltage** | Standard power supply 12V DC, support 7~24V DC |
| **Power consumption** | < 230uA in low power mode; 10mA~30mA in normal mode; Maximum 230-360mA (when making a phone call, it is related to the strength of the signal; and the weaker the signal, the bigger the consumption) |
| **Means of communication** | Optional < GSM , GPRS, 3G, 4G, NB-IoT, LoRa, Ethernet > |
| **Communication protocol** | Modbus RTU over TCP protocol, MQTT protocol, Data transparent transfer |
| **SIM card** | Nano SIM card |
| **External antenna** | SMA Antenna interface, 50 Ohm |
| **USB** | Micro USB interface |
| **DO - digital output** | OC type - open collector output, maximum load 1.5A/25V DC |
| **DIN - digital input** | Dry and wet contact compatible; wet contact 0~1V is close, 2~30V is open |
| **AIN - analog input** | 4~20mA or 0~5V |
| **AM2301 temperature and humidity input** | AM23001: temperature measuring range -40 to 80°C, precision $\pm$ 0.5°C, humidity measuring range 0~99.9%RH, precision $\pm$3%RH |
| **DS18B20 temperature input** | DS18B20: temperature measurement range -55 to 125°C, precision $\pm$ 0.5°C |
| **RS485 serial communication** | A single package transmitted through the RS485 serial port is up to 250 bytes. |
| **Cache capacity** | 32M-bit / 4M-Byte（4,194,304 Bytes） |
| **Working temperature range** | -10 to 60°C |
| **Working humidity range** | Maximum relative humidity 95% (condensation free) |
| **Metal shell Size** | 54mm * 48mm * 19mm |
| **Water Proof Shell Size** | 65mm * 45mm * 21mm |
| **PCB Size** | 50.3mm * 36.8mm * 1.6mm |
| **PCBA pin definition** | When used as a PCBA module, there are 7 pins, starting from the JP1 mark: Positive input pin, negative input pin, 1, 2, 3, signal indicator light pin, I/O indicator light pin<br>(For the definition of 1, 2, and 3 pins, please refer to 6.2 Wiring Instructions) |

# 6. Device Description
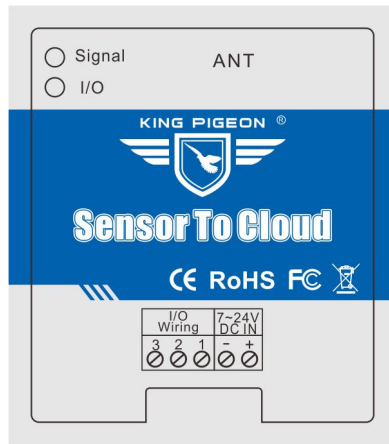


Metal shell panel label
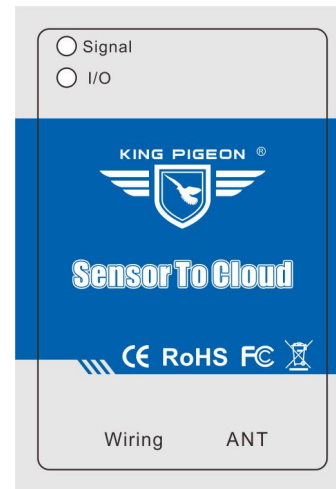


Waterproof shell panel label

# 7. Appendix A - Device Selection Table

| Model | I/O type | Communication | Communication Protocol |
|-------|----------|---------------|------------------------|
| IOT10RGT | DO – Digital Output (Open Collector) | GSM/GPRS | Modbus RTU Over TCP |
| IOT10DGT | DIN – Digital Input | GSM/GPRS | Modbus RTU Over TCP |
| IOT10AGT | AIN - 4~20mA Analog Input | GSM/GPRS | Modbus RTU Over TCP |
| IOT10VGT | AIN - 0~5V Analog Input | GSM/GPRS | Modbus RTU Over TCP |
| IOT10BGT | DS18B20 Temperature Sensor Input | GSM/GPRS | Modbus RTU Over TCP |
| IOT10MGT | AM2301 Temp&Hum Sensor Input | GSM/GPRS | Modbus RTU Over TCP |
| IOT10UGT | RS485 Serial Port | GSM/GPRS | Transparent Transmission |
| IOT10RWT | DO – Digital Output (Open Collector) | 3G | Modbus RTU Over TCP |
| IOT10DWT | DIN – Digital Input | 3G | Modbus RTU Over TCP |
| IOT10AWT | AIN - 4~20mA Analog Input | 3G | Modbus RTU Over TCP |
| IOT10VWT | AIN - 0~5V Analog Input | 3G | Modbus RTU Over TCP |
| IOT10BWT | DS18B20 Temperature Sensor Input | 3G | Modbus RTU Over TCP |
| IOT10MWT | AM2301 Temp&Hum Sensor Input | 3G | Modbus RTU Over TCP |
| IOT10UWT | RS485 Serial Port | 3G | Transparent Transmission |
| IOT10RLT | DO – Digital Output (Open Collector) | 4G | Modbus RTU Over TCP |
| IOT10DLT | DIN – Digital Input | 4G | Modbus RTU Over TCP |
| IOT10ALT | AIN - 4~20mA Analog Input | 4G | Modbus RTU Over TCP |
| IOT10VLT | AIN - 0~5V Analog Input | 4G | Modbus RTU Over TCP |
| IOT10BLT | DS18B20 Temperature Sensor Input | 4G | Modbus RTU Over TCP |
| IOT10MLT | AM2301 Temp&Hum Sensor Input | 4G | Modbus RTU Over TCP |

| IOT10ULT | RS485 Serial Port | 4G | Transparent Transmission |
|---|---|---|---|
| IOT10RNT | DO – Digital Output (Open Collector) | NB‑IoT | Modbus RTU Over TCP |
| IOT10DNT | DIN – Digital Input | NB‑IoT | Modbus RTU Over TCP |
| IOT10ANT | AIN - 4~20mA Analog Input | NB‑IoT | Modbus RTU Over TCP |
| IOT10VNT | AIN - 0~5V Analog Input | NB‑IoT | Modbus RTU Over TCP |
| IOT10BNT | DS18B20 Temperature Sensor Input | NB‑IoT | Modbus RTU Over TCP |
| IOT10MNT | AM2301 Temp&Hum Sensor Input | NB‑IoT | Modbus RTU Over TCP |
| IOT10UNT | RS485 Serial Port | NB‑IoT | Transparent Transmission |
| IOT10RRT | DO – Digital Output (Open Collector) | LoRa | Modbus RTU Over TCP |
| IOT10DRT | DIN – Digital Input | LoRa | Modbus RTU Over TCP |
| IOT10ART | AIN - 4~20mA Analog Input | LoRa | Modbus RTU Over TCP |
| IOT10VRT | AIN - 0~5V Analog Input | LoRa | Modbus RTU Over TCP |
| IOT10BRT | DS18B20 Temperature Sensor Input | LoRa | Modbus RTU Over TCP |
| IOT10MRT | AM2301 Temp&Hum Sensor Input | LoRa | Modbus RTU Over TCP |
| IOT10URT | RS485 Serial Port | LoRa | Transparent Transmission |
| IOT10RET | DO – Digital Output (Open Collector) | Ethernet | Modbus RTU Over TCP |
| IOT10DET | DIN – Digital Input | Ethernet | Modbus RTU Over TCP |
| IOT10AET | AIN - 4~20mA Analog Input | Ethernet | Modbus RTU Over TCP |
| IOT10VET | AIN - 0~5V Analog Input | Ethernet | Modbus RTU Over TCP |
| IOT10BET | DS18B20 Temperature Sensor Input | Ethernet | Modbus RTU Over TCP |
| IOT10MET | AM2301 Temp&Hum Sensor Input | Ethernet | Modbus RTU Over TCP |
| IOT10UET | RS485 Serial Port | Ethernet | Transparent Transmission |
| IOT10RGM | DO – Digital Output (Open Collector) | GSM/GPRS | MQTT |
| IOT10DGM | DIN – Digital Input | GSM/GPRS | MQTT |
| IOT10AGM | AIN - 4~20mA Analog Input | GSM/GPRS | MQTT |
| IOT10VGM | AIN - 0~5V Analog Input | GSM/GPRS | MQTT |
| IOT10BGM | DS18B20 Temperature Sensor Input | GSM/GPRS | MQTT |
| IOT10MGM | AM2301 Temp&Hum Sensor Input | GSM/GPRS | MQTT |
| IOT10RWM | DO – Digital Output (Open Collector) | 3G | MQTT |
| IOT10DWM | DIN – Digital Input | 3G | MQTT |
| IOT10AWM | AIN - 4~20mA Analog Input | 3G | MQTT |
| IOT10VWM | AIN - 0~5V Analog Input | 3G | MQTT |
| IOT10BWM | DS18B20 Temperature Sensor Input | 3G | MQTT |
| IOT10MWM | AM2301 Temp&Hum Sensor Input | 3G | MQTT |
| IOT10RLM | DO – Digital Output (Open Collector) | 4G | MQTT |
| IOT10DLM | DIN – Digital Input | 4G | MQTT |
| IOT10ALM | AIN - 4~20mA Analog Input | 4G | MQTT |
| IOT10VLM | AIN - 0~5V Analog Input | 4G | MQTT |
| IOT10BLM | DS18B20 Temperature Sensor Input | 4G | MQTT |
| IOT10MLM | AM2301 Temp&Hum Sensor Input | 4G | MQTT |
| IOT10RNM | DO – Digital Output (Open Collector) | NB‑IoT | MQTT |
| IOT10DNM | DIN – Digital Input | NB‑IoT | MQTT |
| IOT10ANM | AIN - 4~20mA Analog Input | NB‑IoT | MQTT |

| | | | |
|---|---|---|---|
| **IOT10VNM** | AIN - 0~5V Analog Input | NB−IoT | MQTT |
| **IOT10BNM** | DS18B20 Temperature Sensor Input | NB−IoT | MQTT |
| **IOT10MNM** | AM2301 Temp&Hum Sensor Input | NB−IoT | MQTT |
| **IOT10RRM** | DO – Digital Output (Open Collector) | LoRa | MQTT |
| **IOT10DRM** | DIN – Digital Input | LoRa | MQTT |
| **IOT10ARM** | AIN - 4~20mA Analog Input | LoRa | MQTT |
| **IOT10VRM** | AIN - 0~5V Analog Input | LoRa | MQTT |
| **IOT10BRM** | DS18B20 Temperature Sensor Input | LoRa | MQTT |
| **IOT10MRM** | AM2301 Temp&Hum Sensor Input | LoRa | MQTT |
| **IOT10REM** | DO – Digital Output (Open Collector) | Ethernet | MQTT |
| **IOT10DEM** | DIN – Digital Input | Ethernet | MQTT |
| **IOT10AEM** | AIN - 4~20mA Analog Input | Ethernet | MQTT |
| **IOT10VEM** | AIN - 0~5V Analog Input | Ethernet | MQTT |
| **IOT10BEM** | DS18B20 Temperature Sensor Input | Ethernet | MQTT |
| **IOT10MEM** | AM2301 Temp&Hum Sensor Input | Ethernet | MQTT |

# If you have any questions, please contact us.

## http://WWW.4G-RTU.COM

---End---