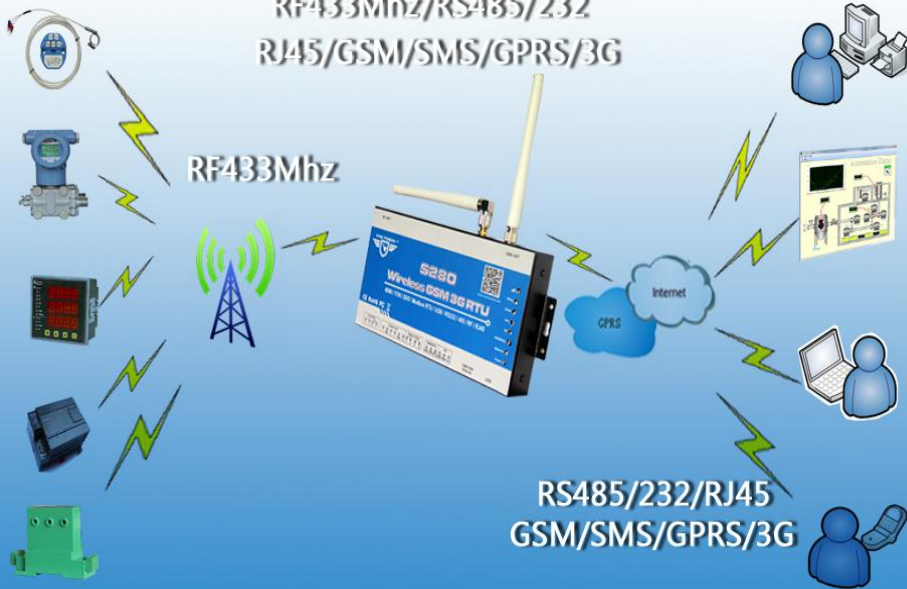


# Wireless Data Acquisition System

RF433Mhz/RS485/232  
RJ45/GSM/SMS/GPRS/3G



## LoRa Wireless data acquisition & alarm system

- S280

# LoRa Wireless Data Acquisition and Alarm System



## KING PIGEON



## Data Sheet

Ver 2.01

S280

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## 【Foreword】

Thank you for using the S280 wireless data acquisition module of Shenzhen King Pigeon Hi-Tech Co., Ltd. Read this product user manual to help you to master the function and usage of this product quickly.

## 【Copyright Notice】

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## 【Disclaimer】

This product is mainly used for wireless data transmission application based on LoRa technology. Please follow the parameters and technical specifications provided in the manual, and pay attention to the precautions when using the product. The Company shall not bear any property or personal injury caused by the improper use or improper use of this product.

## 【Document Revision Record】

Date	Configuration Software Version	Hardware Version	Firmware Version	Modification description
2016.12.10	V1.00	V100	xCV08	1st Version
2018.10.18	V2.01	V101C	xCV11	Add the cellular network to communicate with cloud platform and SCADA; Add a Ethernet port as a TCP client to communicate with the cloud platform and SCADA; Redefine the communication mode between the master and slaves, and add some frequency bands of the communication.



## 【S280 Wireless RTU & Wireless DAM Table】

Model	Master/ Slave	I/O						summary
		T/H	D0	DIN	AIN	RS485	Power output	
S280	Master	1	2	4	X	1	9V-36V	LoRa Gateway
WT-01	Slave	X	X	X	X	1	9V-36V	Wireless LoRa DTU
WT-03	Slave	1	X	X	X	X	9V-36V	Wireless LoRa DAM
WT-05	Slave	1	X	X	2	X	9V-36V	Wireless LoRa DAM
WT-06	Slave	X	X	4	4	X	9V-36V	Wireless LoRa DAM

### 【Special instructions for ordering】

- 1、 For the model have DIN input, default digital input type is wet contact (dry contact input is optional);
- 2、 The master and WT-01 have data transparent transmission function, the master can receive data from the cloud and wireless transmit to WT-01(Max 50pcs), the WT-01 transmit the data to the user' s device via RS485 port, then data communication between TCP and RS485 devices has been accomplished successfully;
- 3、 The devices WT-01 themselves also can do data transparent transmission to each other without the master; but the other slaves transmit data through the master only;
- 4、 The frequency band is 433MHz ( customized 868MHz and 915MHz are available);
- 5、 The analog input of this product support both 0-5V and 4-20mA(Default 0-5V, 4-20mA is optional);
- 6、 The model list describe the numbers of I/O ports, the I/O ports not included in the model list are invalid in the corresponding ports of the device.

# 1. Brief Introduction

The S280 is a cost effective remote terminal unit. It inbuilt quad band GSM/GPRS/3G/4G/RJ45 module ,LoRa module, and ARM® Cortex™ 32 Bit RISC Core. It is a multi-isolation I/O port remote terminal unit and wireless data acquisition system.

The S280 can be used for monitoring maximum 400 distributed I/O endpoints though maximum 50 wireless Data Acquisition Modules by LoRa wireless network. Also it can be used as for converting the meters, transducers, Data Acquisition modules, PLC data via RS485 serial port to LoRa wireless network and then transmits it to GSM/SMS/GPRS/3G/Ethernet network. It performs as a wired – wireless – SMS/GPRS/3G/Ethernet/RS232/RS485 gateway. The range covers about 2~5Km, to add WT-02 Wireless repeaters can increase the wireless distance.

The LoRa Gateway S280 equips 4 digital inputs, 2 solid relay outputs, power status detection module, and on-site temperature and humidity inputs. All of the inputs and outputs are isolation.

The LoRa Gateway S280 can be used as Wireless SMS Alarm when the equipped I/O or 400 distributed I/O alarm occurrence, it also can send pre-definition SMS to up to 10 mobile phone users.

The S280 is suitable for lots of applications, e.g.: Wireless data logging, BTS monitoring, remote data acquisition, telemetrically, farm, energy saving, agriculture, automatically meter reading system, weather station, storage, factory and other applications.

The S280 supports Modbus RTU Slave, Modbus TCP, TCP/UDP, SMS and data transparent transmission protocol through LoRa/RS232/RS485/GSM/SMS/GPRS/3G/Ethernet.

## The Wireless GSM 3G RTU can be used as:

**A Wireless Data Acquisition System.** Supports monitoring up to 50 wireless data acquisition module for max 400 endpoints by LoRa wireless network, the range covers about 1Km, Each endpoint can be setup threshold value or alarm conditions, once the value exceed threshold or activated, it will send out SMS to alert the users immediately.

**A Wireless Gateway.** Though the WT-01 wireless data transfer unit, it can convert the meters, transducers, Data Acquisition modules, PLC data via RS485 serial port to LoRa wireless network and then transmits it to GSM/SMS/GPRS/3G/Ethernet network. It performs as a wired–wireless – SMS/GPRS/3G/Ethernet/RS232/RS485 gateway.

**A SMS Alarm Controller.** The I/O activation or deactivation can be reported by SMS and optionally confirmed by phone calls. Each input can have its own SMS and the message can be programmed.

**A Switch with SMS Remote Control.** SMS texts for switching particular terminals on/off or pulse output are configurable.

**A Timer-Switch which can be activated automatically.** It can be setup when to performs preset logic events, e.g.: timer reports its status, timer switch on/off device or equipment automatically.

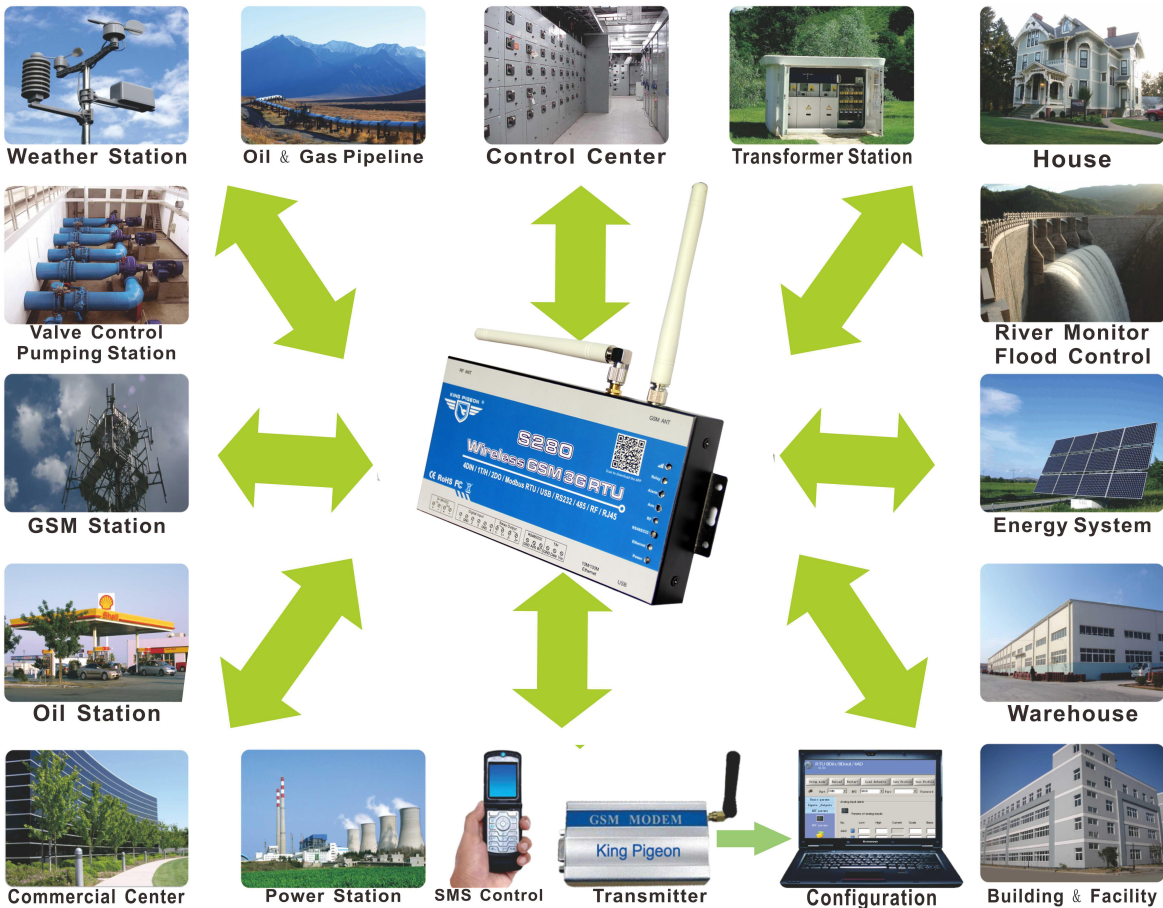
**A SMS reporter.** The LoRa Gateway S280 can setup daily automatically report one or more times of its current status to users automatically.

**A Data Logger.** The unit can save all of the events or acquisition data in internal memory storage, the historical data can export to CSV format via USB port or upload to server by GPRS /3G network according to schedule, no distance limitation.

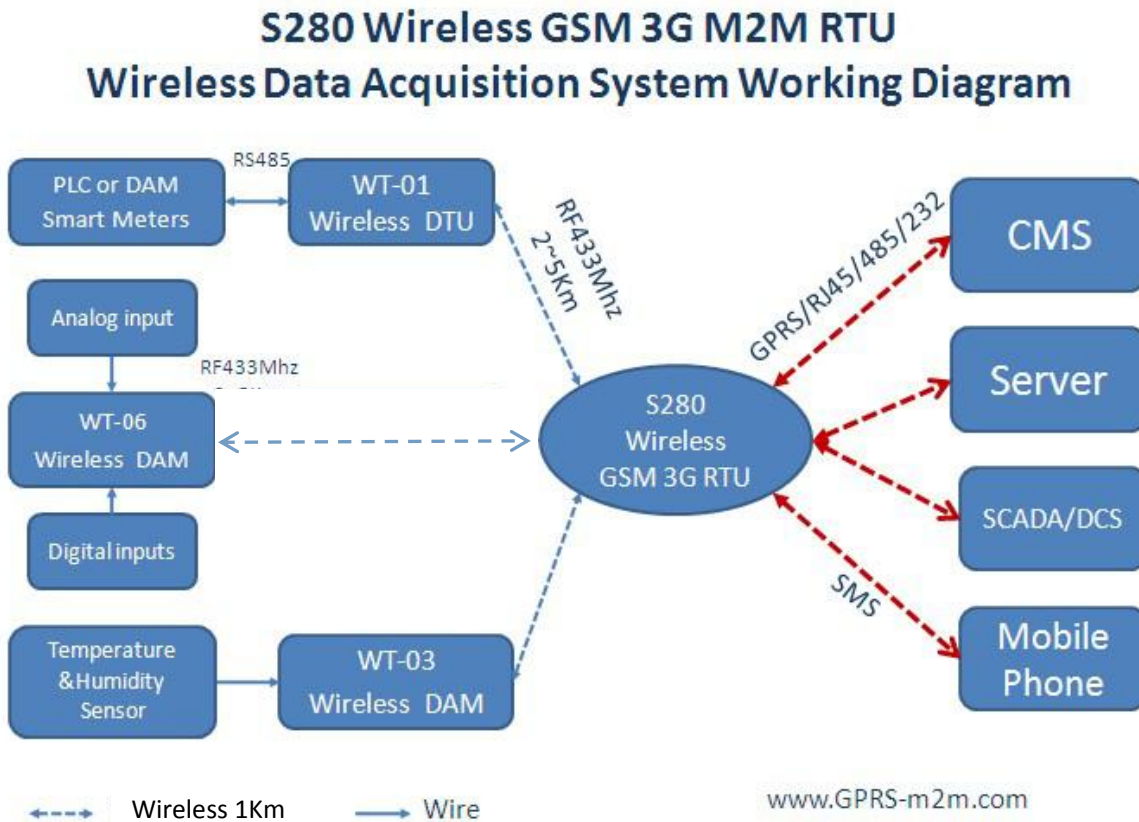
## 2. Typically Application

### Suitable Applications:

1. Security Alarm System applications;
2. Supervision and monitoring alarm systems
3. Automatic monitoring system;
4. Vending Machines;
5. Pumping Stations;
6. Buildings and Real Estate;
7. Weather Stations remote control and data logging;
8. Valve controls;
9. Oil and gas pipelines remote control and data logging;
10. Corrosion protection
11. River Monitoring and Flood Control remote control;
12. Wellheads;
13. Energy saving,street lights control system;
14. Transformer stations;
- 15.Tanks, levels, temperatures,water leakage applications;
16. Unmanned machine rooms;
17. Control room application;
18. PLC and Automation System, M2M;
19. GSM Access Control System, GSM Gate Opener, etc.



## 3. System Schematic Diagram



## 4. S280 Mainly Features(LoRa Gateway)

- 1) Inbuilt ARM® Cortex™-M4 32 Bit RISC Core MCU;
- 2) Quadband 900/1800/1900/2100Mhz GSM GPRS Module inside;
- 3) Frequency range: 433HMz, 868MHz,915HMz;
- 4) Widely Rated voltage range, 9~36VDC, Inbuilt large capacity rechargeable backup battery;
- 5) Large internal memory to save up to 1000 historical records, USB port for configuration, upgrade firmware and export records;
- 6) 2 Relay output,7A/125V AC, 20A/14V DC;
- 7) 4 digital inputs. Compatible with dry contact/ wet node input, logic level 0~1V normally closed, logic level 3~30V is considered normally open;
- 8) It can be used to monitor the on-site ambient temperature and digital humidity sensor. The temperature measurement range is -40~80° C, the accuracy is 0.5° C, the humidity measurement range is 0~99 RH%, and the accuracy is 2%;
- 9) Supports maximum100 LoRa wireless slave;
- 10) Supports I/O ports, and series port. anti-static 15KV, lightning protection;
- 11) 1 RS485 serial port (Optional: RS232) for Modbus RTU Slave, user-defined protocol or data transparent transmission;.
- 12) A cellular network communication module which supports the transmission of Modbus TCP protocol through TCP/IP protocol.



- 13) A RJ45 Ethernet port supports the transmission of Modbus RTU protocol through TCP / IP protocol, and with the function of data transparent transmission, 2KV electromagnetic isolation, shell isolation protection;
- 14) When the master computer server fails or shuts down, the device actively stores alarm data and historical data during the disconnection period, up to 1000 items, and actively replenishes these missing data after re-online.
- 15) Supports remotely restart the RTU, and configure & operate it by SMS commands remotely;
- 16) Supports over voltage protection and phase-reversal protection, provide DC power sources for external device to save wiring cost;
- 17) 10 SMS Alert and auto dial numbers for receiving alarm message, can program to receive specified alarm message.

## 5. Specifications

Item	Reference Scope
DC Power supply	Standard adapter: DC 12V/1.5A Range 9-36VDC
Power consumption	Standby:12V/130mA; Working Max.: 12V/150mA
GSM Frequency	850/900/1800/1900Mhz
LoRa Frequency	420HMz-450MHZ
Transmit power	Class 4 (2W) at EGSM 900 and EGSM 850 Class 1 (1W) at GSM 1800 and GSM 1900
GPRS Connectivity	GPRS multi-slot class 10
GPRS Data Transmission	GPRS data downlink transfer: max. 85.6 kbps GPRS data uplink transfer: max. 42.8 kbps Coding scheme: CS-1, CS-2, CS-3 and CS-4
TCP/IP stack	TCP,UDP
SIM interface	Supporting 3V SIM Card
External antenna	SMA Antenna interface, 50 Ohm
Program Interfaces	1 USB Port
Protocols	SMS, GPRS UDP,TCP, Modbus RTU Slave, Modbus TCP and more equipment protocols can be added according to requirements.
RS232/485	1 RS485(Optional: RS232), Support Transparent transmission, and Modbus RTU Slave.
Max. Wireless DAM	Supports Max. 50 wireless Data Acquisition Modules
Max. Wireless I/O	Supports Max. 400 wireless I/O
RJ45	1 RJ45, support definition protocol and Modbus TCP protocol.
Digital Inputs	4 Digital input, Wet and dry contact are compatibility; wet contact: 0-1V, normally open; 3-30V, normally closed.
Temp.&Hum Inputs	Temperature range: -40°C to +80°C. Humidity Range: 0~99%RH;
Relay Outputs	2, Relay output: 7A/125v AC,20A/14v DC
Power Outputs	1 Port, 9~36VDC output for external device;
Memory Capacity	Internal Memory Card inside, can save the data for 1000events.
Backup Battery	3.7V 900m AH, 2hours
Temperature range	-10-+70 °C
Humidity range	Relative humidity 95% (condensation free)
Exterior dimension	183mm*97mm*26mm
Net Weight	450 g

## 6. Safety Directions



### Safe Startup

Do not use unit when using GSM/3G/4G equipment is prohibited or might bring disturbance or danger.



### Interference

All wireless equipment might interfere network signals of unit and influence its performance.



### Avoid Use at Gas Station

Do not use unit at a gas station. Power off RTU when it near fuels or chemicals.



### Power it off near Blasting Places

Please follow relevant restrictive regulations. Avoid using the device in blasting places.



### Reasonable Use

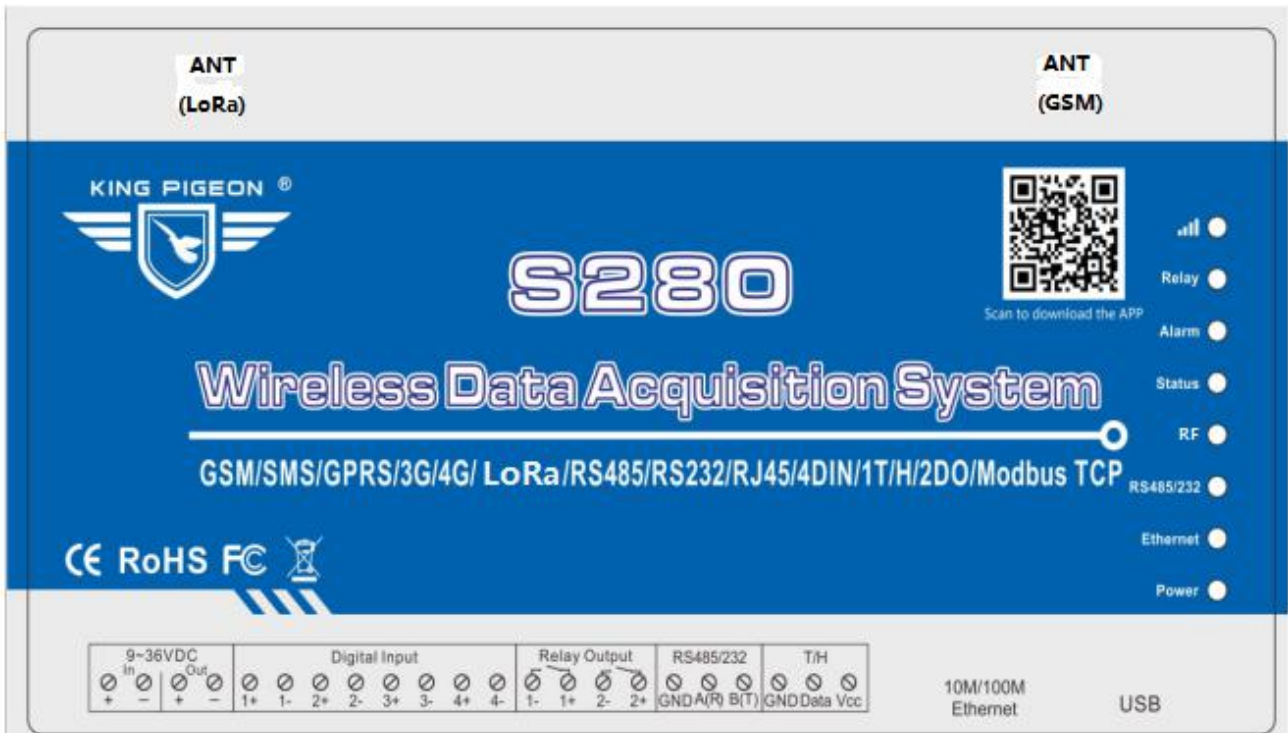
Please install the product at suitable places as described in the product documentation. Avoid signal shielded by covering the mainframe.



### Use Qualified Maintenance Service

Maintenance can be carried out only by qualified maintainer.

## 7. Physical Layout



**Contact us for further cooperation !**

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