



Data Transmission Unit

For Smart transportation, medical, self-service terminal networking
wireless data transmission, remote monitoring, smart home

Synway IoT wireless communications products, including DTU products and data transmission module. The DTU products are industrial-grade wireless data transmission equipment, supporting 4G/3G/2G protocols and a range of wireless network standards: GPRS/WCDMA/TDSCDMA/LTE-FDD/LTE-TDD. The Synway DTU device can provide users with TCP and UDP wireless long-distance data transmission.

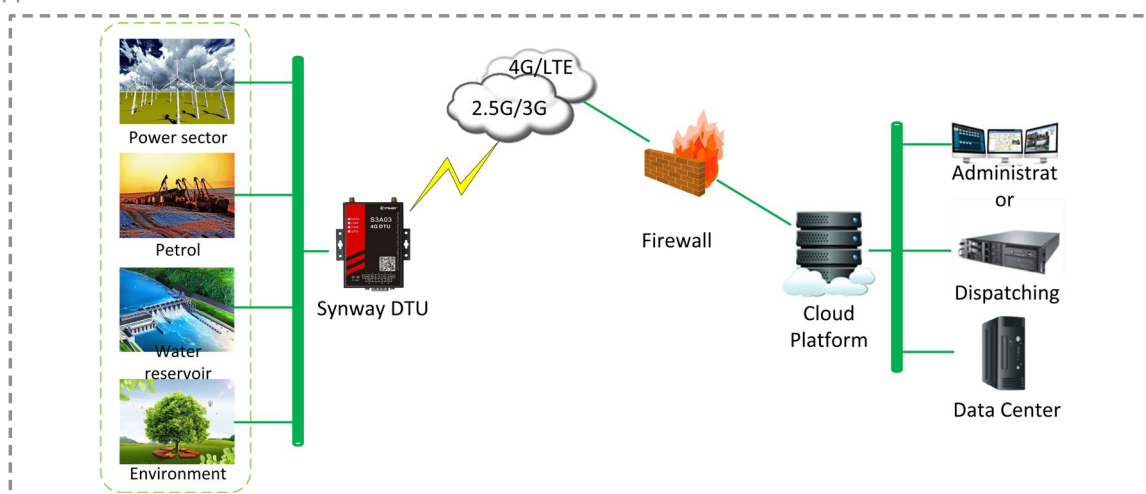
It has been widely applied in urban distribution network automation, water supply, gas pipeline automation, commercial POS, finance, transportation, intelligent control, as well as LED information release system, stock, finance, transportation, public security information release, etc.



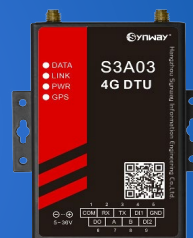
Key Features and Benefits

- Transparent data transmission supporting multiple TCP and UDP modes
- Remote wake-up: including wake-up methods such as SMS, data, etc.
- Support virtual data private network (APN/VPDN)
- Adopt TCP heartbeat link detection mechanism for online detection and online maintenance
- Intelligent off-line detection, automatic reconnection and data transmit to assure online status
- With WDT watchdog design and FreeRTOS OS to ensure high reliability
- Built-in power connector with reverse protection and overvoltage protection, metal case(IP30 class) suitable for a variety of industrial applications
- SIM/USIM built-in 15KV ESD protection, RS232/RS485 interface built-in 15KV ESD protection, 1.8V/3V push-rod SIM card interface
- Support a variety of online and offline trigger modes, including SMS, phone ringing, serial data trigger
- Embedded standard TCP/IP protocol stack, support for registration package, heartbeat packet mechanism
- Support dual data center backup and multiple data centers (2) to accept data

Typical Application



Data Transmission Unit



DTU Features

Physical Dimension:

101*76*21.8mm

Weight:

TBD

Shell protection rating:

metal enclosure, protection class IP30; Isolation of shell and system for high security field applications

Working temperature:

-40 °C ~ +85 °C

Storage temperature:

-40 °C ~ +85 °C

Power supply:

Voltage: range 5V ~ 36V

80~95mA@12VDC in standby status

Typical supply voltage: DC12V/1A

Wiring form: configuration 12V@1A adapter

Current consumption: 80~95mA@12VDC under normal status;
35~45mA@12VDC in standby mode

Wireless parameters:

Network standard: LTE (FDD): B1, B3, B5, B8

LTE (TDD): B38, B39, B40, B41

WCDMA: B1, B8

TD-SCDMA: B34, B39

EDGE/GPRS/GSM : 900/1800 MHZ

Data rate:

FDD-LTE: 130Mbps (downlink rate) 35Mbps (uplink rate)

TDD-LTE: 150Mbps (downlink rate) 50Mbps (uplink rate)

WCDMA: 42Mbps (downlink rate) 5.76Mbps (uplink rate)

TD-SCDMA: 4.2Mbps (downlink rate) 2.2Mbps (uplink rate)

Transmit power:

<23dbm

Receive sensitivity:

<-93.3dBm

Antenna interface:

RF antenna interface

GNSS antenna interface (reserved) impedance 50R

Hardware interface:

Using DB9 male output

Communication method: Support RS232, RS485, TTL mode

Serial interface parameter support:

Baud rate: 1200/2400/4800/9600/14400/

19200/38400/57600/115200

Data bits: 5/6/7/8 check digit: none / odd / coupling

SIM card interface: adaptive

Stop position: 1/2

Support 1.8V / 3.0V SIM

Network:

2G (GSM network)

2.5G network (GPRS network)

3G network (WCDMA network, TD-SCDMA network)

4G network (HSPA+ network, LTE network)

Data transmission module - LC20

LTE data transmission module series products of Synway, based on the new generation of information technology and long-distance wireless data transmission technology, have been widely used in intelligent endpoint products of the Internet of Things. With a variety of product categories, Synway's wireless data transmission module and wireless data solution have been applied into mobile payment, vehicle networking, public safety, industrial routing and consumer electricity. Subsystems, intelligent power, intelligent meter reading, intelligent terminals, goods tracking and other fields.

Functions

- Industrial architecture suitable for various application environments
- Built-in hardware and software watchdog, no crash, no disconnection
- Supporting Transparent Data Transfer
- Support various configuration software and a third-party software
- Multiple working frequency bands, multi-channel, multi-rate to fit to

LC20 Features

Dimension:

29.0 ± 0.15 × 32.0 ± 0.15 × 2.3 ± 0.2mm

Weight:

TBD

Operating temperature:

-35 °C ~ +75 °C

Supply voltage: VBAT supply voltage range: 3.3V ~ 4.3V

Transmit power:

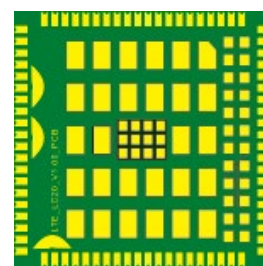
Class 4 (33dBm±2dB) for GSM900 Class 1 (30dBm±2dB) for DCS1800

Class E2 (27dBm±3dB) for GSM900 8-PSK Class E2 (26dBm±3dB) for DCS1800 8-PSK Class 3 (24dBm±1dB) for CDMA BCO

Class 3 (24dBm+1/-3dB) for WCDMA bands Class 2 (24dBm+1/-3dB) for TD-SCDMA bands Class 3 (23dBm±2dB) for LTE FDD bands Class 3 (23dBm±2dB) for LTE TND bands

Data transmission:

LTE: support for non-CA CAT4, support 1.4~20MHz RF bandwidth downlink support multi-user MIMO



various needs

- High Speed Wireless Communication and Large Data Buffer
- Data-initializing sending for transparent transmission
- High reliability, small size and light weight

FDD: Maximum uplink rate of 50Mbps, maximum downlink rate of 150Mbps

TDD: maximum uplink rate of 35Mbps, maximum downlink rate of 130Mbps

WCDMA: Support 3GPP R8 DC-HSPA+

Support 16-QAM, 64-QAM and QPSK modulation

3GPP R6 CAT6 HSUPA: Maximum uplink rate of 5.76Mbps

3GPP R8 CAT24 DC-HSPA+: Maximum downlink rate of 42Mbps

TD-SCDMA: Support CCSA Release3, uplink rate of 2.2Mbps (maximum), downlink rate of 4.2Mbps (maximum)

CDMA: Support CDMA 1X Advanced, 1XEV-DORev0/-DORevA

Maximum uplink rate of 1.8Mbps, maximum downlink rate of 3.1Mbps

GSM: R99: CSD transmission rate: 9.6kbps, 14.4kbps

Data transmission module - LC20



GPRS: Support GPRS multi-slot class 12 (default is 12)

Encoding format: CS-1/CS-2/CS-3 and CS-4

Up to 4 Rx slots per frame

EDGE: Support for EDGE multi-slot class 12 (default is 12)

Support GMSK and 8-PSK

Downstream coding format: CS 1-4 and MCS 1-9

Upstream coding format: CS 1-4 and MCS 1-9

GNSS: Qualcomm Gen8C-Lite, agreement: NMEA 0183

Antenna interface:

Includes main antenna interface (ANT_MAIN)

Rx-diversity antenna interface (ANT_DIV)

GNSS antenna interface (ANT_GNSS)

Rx-diversity:

Support LTE/WCDMA Rx-diversity

Network protocol features: Support PPP / QMI, PAP, CHAP protocol

AT command: Comply with 3GPP TS 27.007, 27.005

New AT commands for wind and lightning intelligence.

Software upgrade: USB

Short message (SMS):

Text and PDU mode, point-to-point MO and MT

Short message cell broadcast, short message storage: default stored in the module

Audio features:

Support 1 channel digital audio interface: PCM interface

GSM: HR/FR/EFR/AMR/AMR-WB

WCMDA: AMR/AMR-WB

LTE: AMR/AMR-WB

Support for echo cancellation and noise suppression

Application interface:

USIM card interface: Support USIM/SIM card: 1.8V and 3V

PCM interface: Supports 8-bit A-law, u-law and 16-bit linear encoding formats supporting long frame mode and short frame mode, Master mode and slave mode (only be used as master mode in long frames mode)

USB interface:

Compatible with USB2.0 features (supports slave mode)

Main serial port:

Used for AT command transmission and data transmission to support RTS and CTS hardware flow control

Debug serial port:

For Linux control, log output, baud rate 115200bps

ADC interface: 2 channels I2C interface: 1 way

RoHS: All devices are fully compliant with EU RoHS standards

Network standard / GNSS:

FDD-LTE : B1/B3/B5/B8

TDD-LTE: B38/B39/B40/B41

WCDMA: B1/B8

TD-SCDMA: B34/B39

CDMA: BC0

GSM: 900/1800

GNSS features: GPS, GLONASS

BeiDou/Compass, Galileo

Monitoring equipment on remote

Various large mechanical equipments (such as unmanned production line robots, CNC machine tools, injection molding equipment, compressors, HVAC equipment) have a long service life, and need after-sales support in the long-term use process for much maintenance and troubleshooting.

At present, these equipments generally depend on manual troubleshooting and on-site inspection. However, due to their high volume, it is time-consuming and labor-intensive to maintain them by traditional manner. There is much delay in afterward troubleshooting, causing inconvenience to users and low efficiency.

Real-time transmission of operation and maintenance data

In the actual application scenario, these equipments can use the Synway DTU product to transmit real-time data in real-time. The data center is connected to these terminal equipments to realize real-time data monitoring of the devices for 365 days*24 hours.

Remote monitoring operation

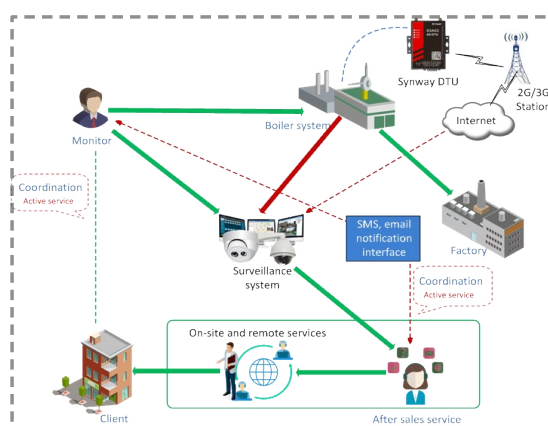
Through online monitoring, the dispatch center (data center) can grasp data of running status of the equipments in real time, and adjust the operating parameters to the optimal state through remote control, achieving a more reliable and efficient state. Besides, it also helps reduce the number of expatriates, save manpower and travel expenses, and improve the overall utilization of equipment.

Incident alarm, remote maintenance

Receive the alarm information pushed by the system in real time and release the alarm data to set up the alarm record history; Information inquiry; product upgrade, device pre-alarm, fault SMS alarm prompt, etc., all of which greatly reduce equipment failure rate, shorten equipment failure time, improve customer satisfaction, and minimize loss caused by equipment failure and maintenance; At the same time, the equipments can also adopt centralized, unified monitoring and management and remote operation and maintenance of all terminal products through various cloud-based management platforms.

Applications

Industrial boiler wireless monitoring: The boiler is equipped with multiple sensors such as temperature, pressure, smoke, water hardness, etc. Once the boiler works, its sensors automatically feed various types of data of the boiler operation to Synway DTU modules, which connect to the wireless network and implement real-time transmission to the customer's remote monitoring center. The management center analyzes the real-time curves and data reports provided by the system. Once any abnormalities or deviations in the operational data are found, the system automatically sends emails or information to the after-sales service personnel to provide timely maintenance solutions for those devices that operate abnormally.



Self-help wireless terminal equipment

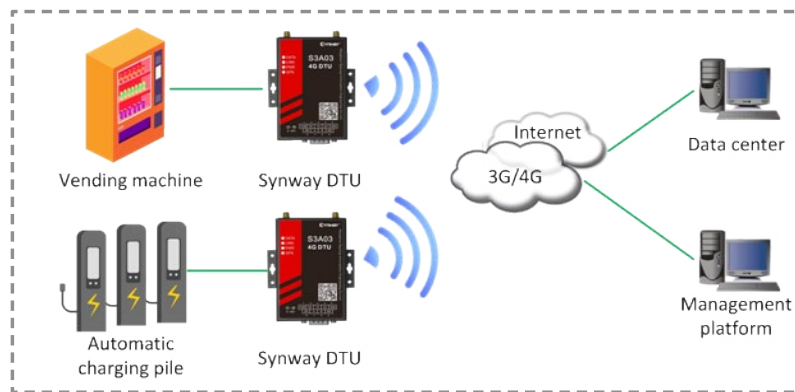
New energy recharging device

In the application of new energy, the recharging device is very commonly available, and the recharging device function is similar to traditional gas dispenser. However, recharging devices are distributed in wide area, and difficult to manage. And with the rapid development of new energy vehicles, the recharging network topology has to be flexible and scalable. There are strict requirements for communication reliability, including harsh environments, electromagnetic interference or noise interference in the long run. The system has to not only maintain reliable communications, but also minimize the construction and maintenance cost. By using Synway DTU equipment for data transmission, installation, operation and maintenance, recharging devices can be optimized to better fit to the new energy industry.



Self-service terminal device

In real life, the self-service terminal device is dedicated to serving customers, and can realize functions such as sales, collection, payment, and inquiry. Because of the convenient and instant service mode of self-service wireless terminal equipment, they have become a lifestyle, and all kinds of wireless self-service terminal devices can use Synway DTU equipment. Through 3G/4G wireless network, wireless terminal equipment and data monitoring center can establish transparent data channels to control and scrutinize wireless self-service equipment. By networking, the DTU device can automatically and timely report state of the self-service wireless terminal device, and 24-hour network monitoring can ensure efficient operation of the terminal device.



Self-service wireless terminal equipment IoT application

Based on 4G/3G wireless network, Synway DTU can help self-service terminal wireless device to connect Internet. Each self-service machine is a terminal in the network. Through wireless connection, self-service terminal operators can monitor the status of each self-service terminal in real time and adjust supply chain and electronic promotional advertising at any time.

Synway DTU equipment fulfills the need for stable and reliable running of remote wireless terminals. Synway DTU adopts industrial-grade design and intelligent anti-drop line, which can effectively guarantee the normal operation of the distributed wireless system.

Intelligent public communication wireless application

In the field of public intelligent transportation, Synway DTU equipment has also been widely used in diverse applications, among which include bus E-card wireless IoT application and wireless IoT application of co-shared bicycle. These public transportation systems are usually composed of data monitoring center, transmission equipment (DTU), data acquisition equipment, terminal vehicle. In this sophisticated system, DTU connected to 3G/4G network, transmits the vehicle positioning information, bus card information, vehicle working status and other data to the monitoring center in real time, which then interacts with the intelligent parking system, the clearing system, and other application systems. This enables the data service center to effectively control various vehicles.

Highway Monitoring IoT application

With monitoring system built on Synway DTU wireless equipment, traffic administrators can transmit data, real-time monitor road condition and traffic events, implement automatic alarm and video recording at 24*7, and coordination across division to improve management capability.

Digital transmission field application



Smart POS
Scanning code PDA
Cashier



Car DVR, car T-BOX
Car navigation, vehicle tracking
Cargo tracking, OBD



Smoke video surveillance
Intelligent access control, gas detector
intercom system, police service, law enforcement



Utility meter, water meter
Heating meter, gas meter
Charging pile, smart grid



Smart medical, intelligent street light
Intelligent building, co-shared bicycle
Intelligent parking lot, digital signage



Industrial router
CPE, VoIP equipment
Digital transmission unit DTU

About Synway

As a major manufacturer and supplier of communication products and solutions, Synway specializes in providing superior Multimedia Gateway, Integrated Multimedia Switch, Telephony Hardware in use for Telecom communications. www.synway.net