

# TD-DTU-PRO

## Data Transfer Unit Datasheet

TD-DTU-PRO Data Transmission Unit is an industrial-grade communication terminal developed by Tespro for IoT data acquisition from smart electricity, water, and gas meters. It supports 2G/3G/4G networks, 100Mbps Ethernet, and GNSS positioning, with RS232 or RS485 interfaces for reliable field data collection and remote transmission.

The device integrates industrial protocols including IEC1107, DLMS, DL/T645, and Modbus, and supports MQTT, TCP, and UDP communication. It enables data acquisition, protocol conversion, and remote management, with connectivity to third-party platforms or the Tespro Cloud. Its industrial-grade design and electrical protection make it suitable for smart energy, industrial automation, and remote O&M applications.



Global Network Adaptation  
2G / 3G / 4G



1\*WAN + 1\*LAN  
10/100 Mbps



Wi-Fi 4: 802.11b/g/n



1\*RS232 / 1\*RS485

## Typical application scenarios



## Applied Topology



## Core Advantages



### 2G/3G/4G cellular networks

Supports 2G/3G/4G cellular networks, with Cat.1 / Cat.4 / Cat.6 for 4G access. Dual SIM and dual eSIM enable flexible network switching and link redundancy.



### 100M Ethernet Interface + Wi-Fi

Equipped with 100Mbps Ethernet ports supporting WAN/LAN auto-sensing and Wi-Fi 4 (2.4GHz), the device provides reliable wired and wireless connectivity for industrial networking and data transmission.



### Serial Communication Interface

Supports RS232 or RS485 interfaces, and multiple parity modes, enabling reliable data acquisition and transmission across diverse industrial equipment.



### Intelligent Data Acquisition

Supports real-time, interval-based, and scheduled data reporting, with flexible configuration to enable automatic meter data collection and reliable transmission.



### Support for multiple protocols

Built-in IEC1107, DLMS, DLT645, and Modbus protocols support multi-meter acquisition and protocol conversion, ensuring reliable transmission between field devices and cloud platforms across applications



### Excellent weather resistance

Operates reliably from -40°C to +75°C with 5%–95% RH non-condensing humidity. Designed for harsh industrial environments, including high-altitude and extreme operating conditions.

## Features

### Performance & Hardware

- 32-bit single-core processor, 580 MHz clock speed, high-throughput routing performance
- 128MB DDR3 RAM + 32MB Flash storage; supports up to 64MB RAM (optional)
- Standard MiniPCIe and M.2 slots; compatible with global 2G/3G/4G cellular networks

### Interfaces & Connectivity

- Two 100 Mbps Ethernet ports (1 LAN + 1 WAN)
- Built-in lightning protection with 3 kV electromagnetic isolation
- Supports Wi-Fi 4 (2.4GHz) with a maximum speed of 300Mbps.; supports AP/Client modes
- 1 serial port (RS232 / RS485), with high-voltage isolation
- Supports Cellular/Wi-Fi/Ethernet WAN link backup and ICMP probing

### Protocols & Applications

- Features built-in support for protocols such as DLT645, IEC1107, and DLMS, enabling communication across multiple protocols
- Modbus RTU/TCP gateway with MQTT/TCP/UDP/HTTP northbound communication
- Network and serial port transparent transmission service; southbound data acquisition supporting Modbus RTU / Modbus TCP / DLT 645 / IEC 1107 / IEC 61850 / IEC 62056-21 / DLMS.
- IPsec, OpenVPN, GRE, L2TP, PPTP, DMVPN and WireGuard
- Real-time energy consumption monitoring and multi-device alerts
- Supports the connection of optical probes to enable optoelectronic data acquisition

### Security & Networking

- Industrial-grade firewall with zone-based security policies
- Application-layer traffic identification (NetCtrl/DPI engine)
- Supports encrypted data transmission and SSL encryption.
- Supports BLE wireless connectivity and parameter configuration via AT commands; a dedicated configuration tool is provided.
- Supports network functions such as DDNS, VRRP, DHCP Server, and IP Passthrough
- Event alert methods: SMS, Email, DO, SNMP Trap

### Reliability & Protection

- Automatic network disconnection detection with auto-reboot upon dial-up failure or on a scheduled basis
- 9–36 VDC / 3 A with automatic over-voltage cutoff protection
- Reverse polarity, surge and ESD protection

### Management & Development

- Built-in TesproOS, enabling secure remote access, O&M, protocol management, and rapid mobile configuration
- Web management interface with support for switching between dark and light themes

## TesproOS

# TesproOS System

## Remote Management & Cloud Integration

Make device management simpler, safer, and more efficient



### Remote O&M

Remotely monitor device status, manage configurations, improve O&M efficiency, and reduce maintenance costs.



### Mobile Configuration

Support on-site Wi-Fi connection via mobile phone for quick debugging and local device configuration.



### Software & Protocol Management

Support software package and protocol management, with a rich built-in protocol ecosystem and protocol library.



### Online AI Upgrade

Quickly recover from abnormal conditions such as program faults and signal loss, improving overall availability.



Cloud Remote O&M



Easy Configuration



Efficient Troubleshooting



Rich Protocol Support



Secure & Reliable Data



Batch Device Management

## Protocol Support

# Multi-Protocol Support

A rich industrial protocol ecosystem and rapid customization capabilities make device integration easier and enable plug-and-play.

1



Northbound Communication Protocols

- MQTT
- TCP
- UDP

2



Field Data Acquisition Protocols

- Modbus RTU
- CJ188

3



Data Security Protocols

- SSL Encrypted Transmission

4



Power Industry Protocols

- DL/T645
- IEC1107
- DLMS
- DL/T698



Rich Protocol Library  
Covering multiple industrial protocols



Flexible Integration  
Quickly adapts to various devices



Reliable Communication  
Stable connection, safe and reliable



Remote O&M  
Anytime, anywhere, worry-free O&M

## Hardware Specifications

| Category                  | TD-DTU-PRO                                                                                                                                 |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Hardware System           |                                                                                                                                            |
| CPU                       | 32-bit single-core processor, 580 MHz clock speed                                                                                          |
| RAM                       | 128 MB, DDR3                                                                                                                               |
| FLASH                     | 32 MB                                                                                                                                      |
| Network Interfaces        |                                                                                                                                            |
| Ethernet Ports            | 2 x 10 / 100 Mbps Ethernet ports                                                                                                           |
| Cellular Network          | 4G LTE: Cat1 / Cat4 / Cat6                                                                                                                 |
| WAN                       | 1 x WAN 10 / 100 Mbps                                                                                                                      |
| LAN                       | 1 x LAN 10 / 100 Mbps                                                                                                                      |
| SIM Card Slot             | Dual SIM / Dual eSIM / 1 SIM + 1 eSIM                                                                                                      |
| Antenna                   | SMA male (plug); antenna ports:1                                                                                                           |
| Physical Interfaces       |                                                                                                                                            |
| Grounding Terminal        | 1 × Grounding Screw                                                                                                                        |
| Status LEDs               | 4                                                                                                                                          |
| Reset Button              | 1                                                                                                                                          |
| Industrial Interfaces     |                                                                                                                                            |
| Serial Ports              | 1 x RS485 / 1 x RS232, 3 kV high-voltage isolation                                                                                         |
| I/O Interfaces            | /                                                                                                                                          |
| Wi-Fi / WLAN              |                                                                                                                                            |
| Wi-Fi Frequency           | 2.4GHz                                                                                                                                     |
| Protocol Standards        | Wi-Fi 4: 802.11b/g/n                                                                                                                       |
| Maximum Transmission Rate | N300                                                                                                                                       |
| Data Rate                 | 802.11b/g/n: up to 300Mbps                                                                                                                 |
| Transmit Power            | 802.11b:16dBm+/-2dBm(11Mbps); 802.11g:16dBm+/-2dBm(54Mbps); 802.11n@2.4GHz:16dBm +/-2dBm(HT20MCS7); 802.11n@2.4GHz:16dBm +/-2dBm(HT40MCS7) |
| Transmission Distance     | Line-of-sight <= 100 m (actual transmission distance depends on the site environment)                                                      |
| Power Supply              |                                                                                                                                            |
| Power Connector           | 1 x DC power connector (DC 2.1)                                                                                                            |
| Input Voltage Range       | DC input: 9-36 V; reverse-polarity protection supported                                                                                    |
| Standby Power             | < 15mA @12V                                                                                                                                |
| Operating Power           | 40mA @12V                                                                                                                                  |
| Peak Power                | 160mA @12V                                                                                                                                 |

## Hardware Specifications

| Category                                | TD-DTU-PRO                                                                                                    |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Environmental Conditions                |                                                                                                               |
| Operating Temperature                   | -40°C ~ +75°C                                                                                                 |
| Operating Humidity                      | 5% to 95% (non-condensing)                                                                                    |
| Storage Temperature                     | -40°C ~ +85°C                                                                                                 |
| Mechanical Characteristics              |                                                                                                               |
| Dimensions                              | 102 x 69 x 26 mm (including antenna connectors)                                                               |
| Protection Rating                       | IP30                                                                                                          |
| Enclosure                               | Metal enclosure panel                                                                                         |
| Installation                            | DIN-rail / Wall-mounted                                                                                       |
| Cooling Method                          | Fanless cooling                                                                                               |
| Product Weight                          | 200 g                                                                                                         |
| Reliability                             |                                                                                                               |
| Shock                                   | IEC60068-2-27                                                                                                 |
| Vibration                               | IEC60068-2-6                                                                                                  |
| Drop                                    | IEC60068-2-32                                                                                                 |
| Certifications & Standards              |                                                                                                               |
| Regulatory Certifications               | CE, RoHS                                                                                                      |
| EMC Standards                           | EN 55032; EN 55035; EN IEC 61000-6-3:2021; EN IEC 61000-6-1:2019; EN 301489-1;<br>EN 301489-17; EN 301 489-52 |
| RF Standards                            | EN300328; EN301893; EN301511; EN301908-1/-2/-13                                                               |
| SAR+Safety                              | EN50665; EN IEC62368-1                                                                                        |
| Cybersecurity                           | EN18031-1; EN18031-2                                                                                          |
| Electrostatic Discharge (ESD)           | EN 61000-4-2:2009                                                                                             |
| Radiated Immunity                       | EN IEC 61000-4-3:2020                                                                                         |
| Electrical Fast Transient/Burst (EFT)   | EN 61000-4-4:2012                                                                                             |
| Surge Immunity                          | EN 61000-4-5:2014 + A1:2017 (Ethernet ports)                                                                  |
| Conducted Immunity                      | EN 61000-4-6:2014                                                                                             |
| Ring Wave Immunity                      | EN61000-4-12, level 3                                                                                         |
| Power-Frequency Magnetic Field Immunity | EN61000-4-8, horizontal/vertical 400 A/m (> level 2)                                                          |

## Software Specifications

| Category                                 | TD-DTU-PRO                                                                                                                                                            |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Industrial Protocols & Data Capabilities |                                                                                                                                                                       |
| Industrial Protocols                     | Includes Modbus RTU, Modbus TCP, Mbus and other protocols                                                                                                             |
| Modbus                                   | Modbus RTU, Modbus TCP                                                                                                                                                |
| Meter Protocols                          | DLT 645-2007, IEC 1107, IEC 61850, IEC 62056-21, DLMS                                                                                                                 |
| DLMS/COSEM                               | DLMS                                                                                                                                                                  |
| Custom Modbus Registers                  | Modbus TCP custom register block request: enables reading and writing of files within the DTU, extending Modbus TCP client functionality                              |
| Supported Data Formats                   | INT/UINT (8/16/32-bit), 32-bit Float, HEX, ASCII; supports MSB/LSB and byte-order conversion (ABCD/DCBA/CDAB/BADC)                                                    |
| DTU Functions                            | Supports TCP/UDP transparent transmission; Modbus RTU-to-Modbus TCP conversion; DCTCP/DCUDP modes                                                                     |
| Data to Server                           | Supports HTTP(S)/MQTT/Azure MQTT; multi-source data aggregation and reporting; customizable acquisition interval (minimum 1 s); supports custom Lua script extensions |
| Modbus / MQTT Gateway                    | Allows commands to be sent to a Modbus Server via an MQTT Broker and data to be received                                                                              |
| API / Web API                            | Supports Web API; API endpoints are used to retrieve or modify data                                                                                                   |
| Network Capabilities                     |                                                                                                                                                                       |
| Network Access                           | 2G / 3G / 4G cellular networks (or VPDN private network)                                                                                                              |
| Access Authentication                    | Supports CHAP / PAP authentication                                                                                                                                    |
| LAN Protocols                            | ARP                                                                                                                                                                   |
| WAN Protocols                            | PPP, DHCP                                                                                                                                                             |
| Network Protocols                        | TCP, UDP, IPv4, IPv6, NTP, DNS, HTTP, HTTPS, MQTT                                                                                                                     |
| NAT                                      | Supports NAT forwarding and port mapping                                                                                                                              |
| DHCP                                     | Supports DHCP server (for Wi-Fi client IP assignment)                                                                                                                 |
| Network Backup / Failover                | Wi-Fi WAN, VRRP, and wired connection options can all be used for automatic failover                                                                                  |
| QoS                                      | Traffic priority queuing based on source/destination, service, protocol, or port; WMM, 802.11e                                                                        |
| IP Applications                          | Supports Ping, Trace, DHCP Server, DHCP Relay, DHCP Client, DNS relay, DDNS, Telnet                                                                                   |
| DNS / DDNS                               | Supports DoH (DNS over HTTPS), multiple DDNS provider configurations, and manual customization                                                                        |

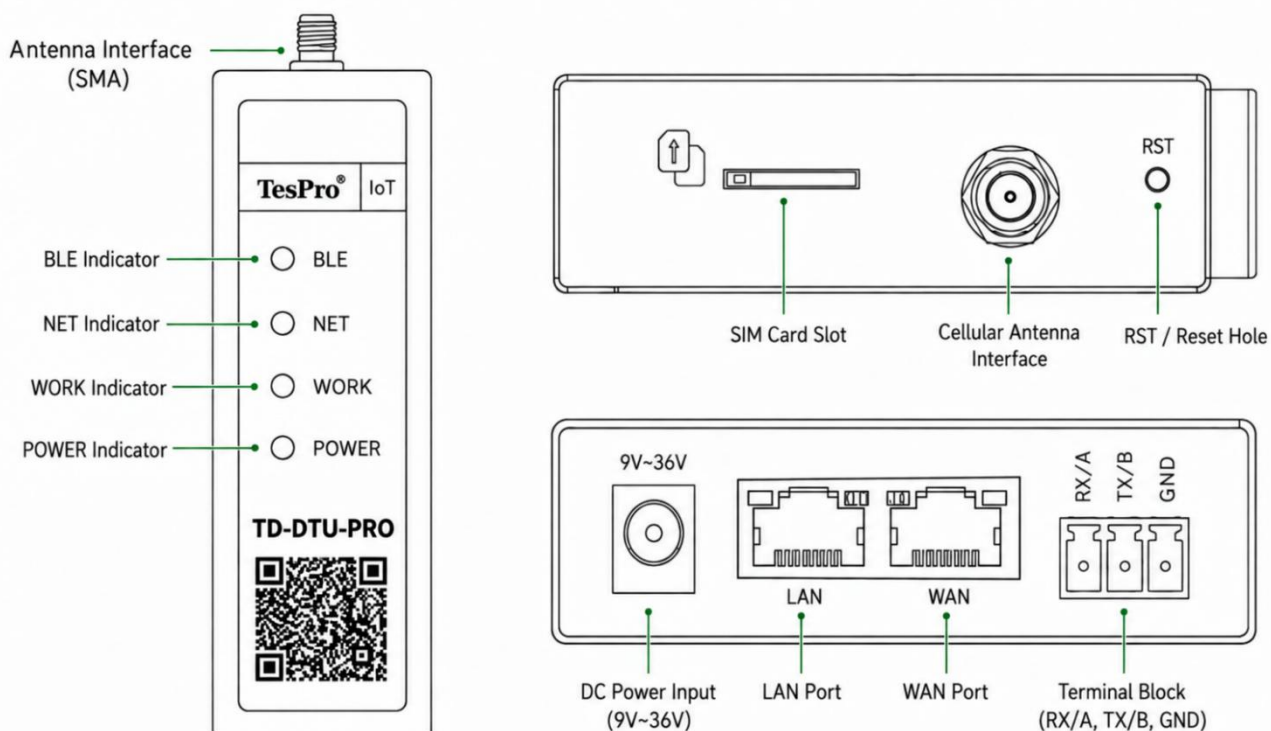
## Software Specifications

| Category                                      | TD-DTU-PRO                                                                                                                                                     |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wi-Fi                                         |                                                                                                                                                                |
| Wireless Mode                                 | Wi-Fi 4: 802.11b/g/n, Access Point(AP), Station(STA)                                                                                                           |
| Wi-Fi Security                                | WPA2/WPA3-Enterprise, WPA2-PSK, WPA3-SAE, and OWE encryption; supports 802.11w PMF (Protected Management Frames); supports client isolation                    |
| Wi-Fi Users                                   | Wi-Fi 4: up to 30 simultaneous connections                                                                                                                     |
| Hotspot Relay                                 | Forward the Wi-Fi hotspot login page to subsequently connected devices                                                                                         |
| SSID / ESSID                                  | SSID stealth mode; MAC-address-based access control                                                                                                            |
| Operating Modes                               | Supports AP, Client, and WDS modes                                                                                                                             |
| Security Features                             | Open System, Shared Key, WPA/WPA2 authentication; WEP/TKIP/AES encryption                                                                                      |
| Network Security & VPN                        |                                                                                                                                                                |
| Network Protection                            | Features a built-in industrial-grade firewall and supports functions such as port forwarding, custom traffic rules, TTL modification, and anti-ping protection |
| Data Protection                               | Supports PPTP, L2TP, GRE, IPSEC VPN, DMVPN, OPENVPN, WireGuard, and other VPN functions; supports digital certificate CA                                       |
| Authentication                                | Pre-shared key / X.509 digital certificate, TACACS+, built-in / external RADIUS authentication, IP / time / login attempt blocking, random password generator  |
| Attack Protection                             | Supports basic DDoS protection (SYN flood / SSH attack protection) and port scanning protection                                                                |
| Access Control                                | Flexible access control for SSH, Web interface, CLI, and Telnet                                                                                                |
| Web Filter                                    | Blacklist for unwanted websites; whitelist for allowed websites only                                                                                           |
| VPN                                           | Supports PPTP, L2TP, IPSec (IKEv1/IKEv2), OpenVPN, and SSTP client connections, as well as GRE tunneling                                                       |
| WireGuard                                     | Supports WireGuard VPN client and server                                                                                                                       |
| ZeroTier                                      | Supports ZeroTier VPN client                                                                                                                                   |
| Tinc                                          | Encryption, authentication, and compression within tunnels; supports client and server modes                                                                   |
| Environmental and Reliability Characteristics |                                                                                                                                                                |
| Hot backup mechanism / VRRP                   | VRRP (listed under network backup)                                                                                                                             |
| Link online detection                         | Sends heartbeat packets for connection monitoring and automatically reconnects if the connection drops                                                         |
| Dual-SIM link switching                       | Supports link switching between dual SIMs or dual eSIMs                                                                                                        |
| Embedded watchdog                             | Features device self-diagnostic capabilities and automatic recovery from operational faults                                                                    |

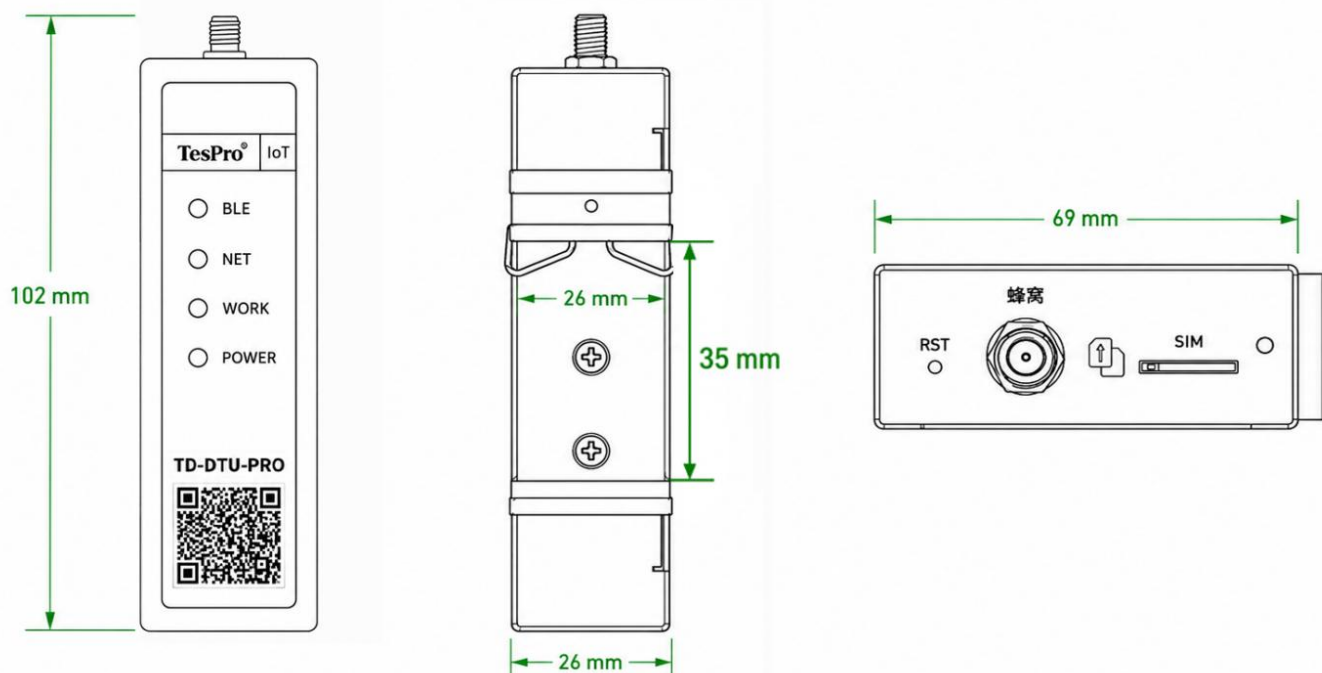
## Software Specifications

| Category                              | TD-DTU-PRO                                                                                                                                             |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Management & Platform                 |                                                                                                                                                        |
| Configuration Methods                 | Web UI, CLI, SSH, JSON-RPC, TesproOS, etc.                                                                                                             |
| Cloud & IoT Platform Integration      | Supports major global platforms: Google, Huawei, Amazon, Microsoft Cloud, iStarOS, Azure IoT Hub, other third-party cloud platforms, and custom clouds |
| FOTA                                  | Firmware updates from server with automatic notifications                                                                                              |
| SNMP                                  | SNMP (v1, v2, v3), SNMP Trap                                                                                                                           |
| MQTT                                  | MQTT Broker, MQTT Publisher                                                                                                                            |
| JSON-RPC                              | HTTP/HTTPS-based management API                                                                                                                        |
| SSH                                   | SSH (v1, v2)                                                                                                                                           |
| Upgrade Methods                       | FOTA; Web UI                                                                                                                                           |
| Logging                               | Event logs, system logs, kernel logs                                                                                                                   |
| Alarm Functions                       | Email message status alerts                                                                                                                            |
| On-Demand Dialing / Activation        | On-demand dialing, data activation, SMS activation                                                                                                     |
| Email                                 | Receives email message status alerts from various services                                                                                             |
| Software System                       |                                                                                                                                                        |
| Operating System                      | TesproOS (Linux)                                                                                                                                       |
| Custom Firmware / GPL Customization   | Supports custom-branded firmware and Web page applications (colors, logo, etc.)                                                                        |
| Package Management                    | Supports installation of additional software packages                                                                                                  |
| Firmware & Configuration              |                                                                                                                                                        |
| Web UI Upgrade                        | Update firmware from file; check firmware on server; configuration files; configuration backup                                                         |
| FOTA Upgrade                          | Firmware update                                                                                                                                        |
| Cloud Batch Upgrade                   | Supports updating firmware/configuration on multiple devices at once through TesproOS                                                                  |
| Upgrade While Retaining Configuration | Updates firmware without losing the current configuration                                                                                              |
| Factory Reset                         | Full factory reset, restoring all system settings including IP address, PIN code, and user data                                                        |

## Interface Diagram



## External dimensions



## Accessories and Packaging



### Accessories Information



**TD-DTU-PRO**  
Data Transmission Unit



**Power Adapter**



**Wi-Fi / Cellular Antenna**



**Quick Start Guide**



### Packaging Information



#### Package Dimensions

**266 × 171 × 67 mm**

Made with eco-friendly recyclable packaging materials,  
meeting green environmental requirements.

### About Tespro

Tespro is an industrial IoT manufacturer with 25 years of experience, specializing in AI computing, industrial IoT, power communication equipment, and software. Its products include industrial gateways, routers, DTUs, optical probes, testing instruments, and management platforms for energy, automation, smart buildings, and commercial applications. With branches in the U.S., U.K., Singapore, Hong Kong, and Zhuhai, Tespro serves 150+ countries and partners with Fortune Global 500 companies.

### Global Office Locations

**USA:** 39 S Hayman Ave, Colorado Springs, CO 80910, US

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