

GaugeLink DTU702 IoT Gateway Datasheet

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DTU702 Embedded Computer / ARM Industrial Computer



DTU702 embedded computer

Basic Parameters

Model	DTU702
Processor / System	NXP IMX6UL Cortex-A7 800MHz (dynamic frequency scaling)
Memory / Storage	Standard configuration: 1. DDR3 256MB, NandFlash 256MB 2. DDR3 512MB, eMMC 4GB Other capacities optional (not stocked; lead time applies)
Cellular Network	3G/4G via MINI PCIe interface, external SIM card slot Supports LTE, WCDMA (HSPA+), CDMA2000 External antenna: rod or suction-cup (puck) type Supports EC20, MU709s, H330S, L710-CN and other 3G/4G modules
WiFi (2.4G,)	Compliant with IEEE 802.11n; backward compatible with 802.11b/g Supports IEEE 802.11i security and IEEE 802.11e QoS 64/128-bit WEP; WPA-PSK/WPA2-PSK; WPA/WPA2 security Wireless rate up to 150M (10× standard 11B products) Freq. 2.400–2.4835 GHz; channels 1–11 (US/CA), 1–13 (CN/EU), 1–14 (JP)
Ethernet	2 independent ports, IEEE 1588, 10/100 Mbps auto-negotiating 5KV air-discharge & 8KV contact-discharge protection
Debug Port	Built-in RS232 debug serial port
TF Card Slot	MMC system specs v4.5/4.2/4.3/4.4/4.41 SD card spec v3.0; SDXC up to 2TB For system updates, storage expansion, data import/export

Serial Ports	7/8 data bits; 1/2 stop bits; programmable parity (even/odd/none) Programmable baud rate; 32-byte Tx FIFO, 32 half-word Rx FIFO RS232: 3-wire (TXD, RXD, GND) RS485: automatic data-flow direction control Default: 4× RS485 or 1× RS232 + 2× RS232 (others: contact sales)
RTC	Built-in high-precision RTC with CR1220 battery
LED Indicators	Power indicator + user-definable LEDs (power / run / fault status)
User-Defined Button	Configuration, factory reset, and similar functions
Power	9–24V DC input

Product Description

The DTU702 uses an ARM Cortex-A7 application processor, with onboard 256MB DDR3 memory and 256MB NandFlash storage, or 512MB DDR3 memory and 4GB eMMC storage. It provides 2 independent 100M Ethernet ports, 3 serial ports, 4× RS485 (RS232/RS485 quantities configurable), 1 TF card slot, WiFi, 3G/4G, plus user-definable LEDs, a button, a USB debug port, and a power indicator. It runs an open Linux operating system for greater stability and easier maintenance.

Designed for industrial applications, the device supports wide-voltage DC input and wide-temperature operation. All components are industrial-grade rated for -45°C to +85°C, withstanding high/low temperatures, sand and dust, and strong electromagnetic interference. It is suitable for harsh industrial environments and employs comprehensive system-protection and anti-disconnection mechanisms to keep the data terminal online at all times.

Features and Advantages

Enclosure	Sheet steel, painted surface finish
Weight	0.5 kg
Dimensions	90 × 65 × 25 mm
Operating Temp.	-45 to 85°C
Operating Humidity	5–95% RH
Storage Temp.	-50 to 100°C
Vibration	1G @ IEC-68-2-6, sine, 5–500 Hz, 1 Oct./min, 1 hr/axis
Shock	5G @ IEC-68-2-27, half-sine, 30 ms
Temp. Monitoring	Built-in temperature sensor
Watchdog	Hardware watchdog (WDT) monitoring
MTBF	Greater than 100,000 hours

Security	Built-in independent hardware encryption circuit to protect user IP
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Operating System

Version	Linux 4.1.15
Development Languages	C, C++, Java, Python, PHP, .NET, etc.
Databases	SQLite, MySQL, etc.
Supported Distributions	Ubuntu, Debian, Buildroot, OpenWrt, and others

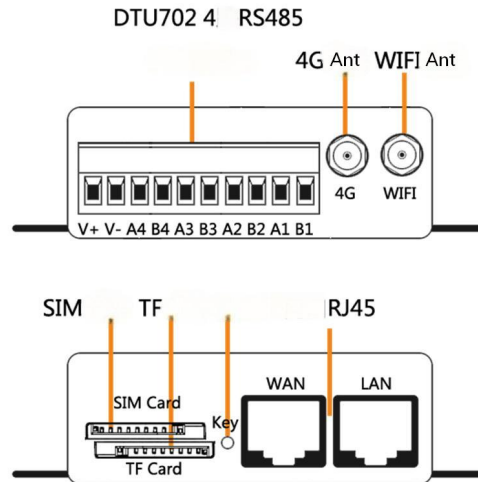


Supported systems: Qt, Yocto Project, Linux, Ubuntu, Buildroot, Debian “Neutral inside and out; customizable labeling”

Interface Definitions

4× RS485 — Phoenix Terminal Pinout (front view, left to right)

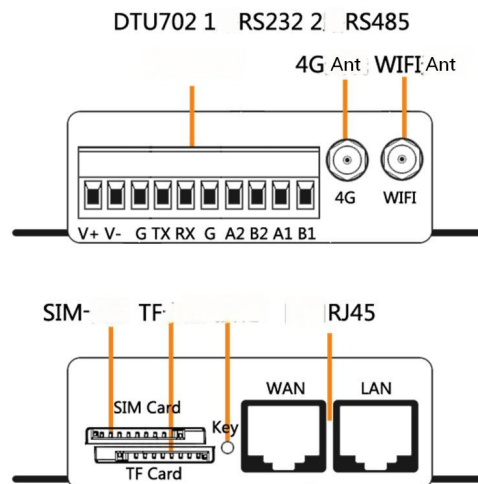
PIN	1	2	3	4	5	6	7	8	9	10
Definition	VCC	GND	A4	B4	A3	B3	A2	B2	A1	B1
Function	Power	RS485		RS485		RS485		RS485		
Node	9–24V /1A DC	/dev/ttymxc4		/dev/ttymxc3		/dev/ttymxc2		/dev/ttymxc1		



Top: Phoenix terminal | 4G天线 = 4G antenna | WIFI天线 = WiFi antenna Terminal: V+ V- A4 B4 A3 B3 A2 B2 A1 B1
 Front: SIM卡座 = SIM slot | TF卡座 = TF slot | 按键 = button (Key) | 网口RJ45 = RJ45 ports (WAN, LAN)

1× RS232 + 2× RS485 — Phoenix Terminal Pinout (front view, left to right)

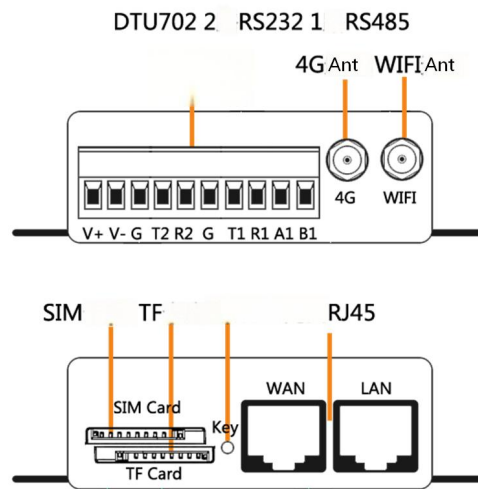
PIN	1	2	3	4	5	6	7	8	9	10
Definition	VCC	GND	G	TX	RX	G	A2	B2	A1	B1
Function	Power	RS232			RS485			RS485		
Node	9–24V /1A DC	/dev/ttymx3			/dev/ttymx2			/dev/ttymx1		



Terminal: V+ V- G TX RX G A2 B2 A1 B1

2× RS232 + 1× RS485 — Phoenix Terminal Pinout (front view, left to right)

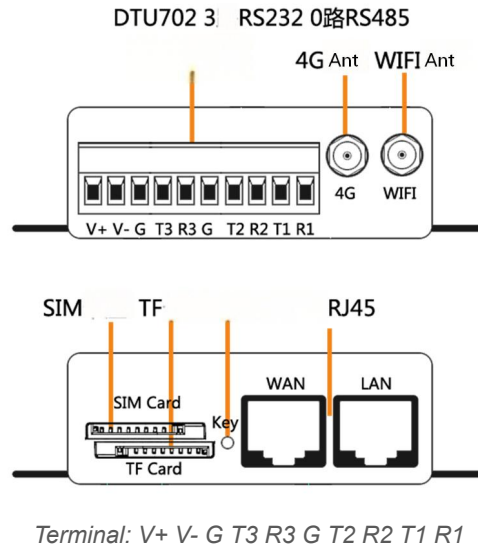
PIN	1	2	3	4	5	6	7	8	9	10
Definit ion	VCC	GND	G	TX2	RX2	G	TX1	RX1	A1	B1
Functi on	Power	RS23 2			RS23 2			RS48 5		
Node	9–24V /1A DC	/dev/tt ymx3			/dev/tt ymx2			/dev/tt ymx1		



Terminal: V+ V- G T2 R2 G T1 R1 A1 B1

3× RS232 — Phoenix Terminal Pinout (front view, left to right)

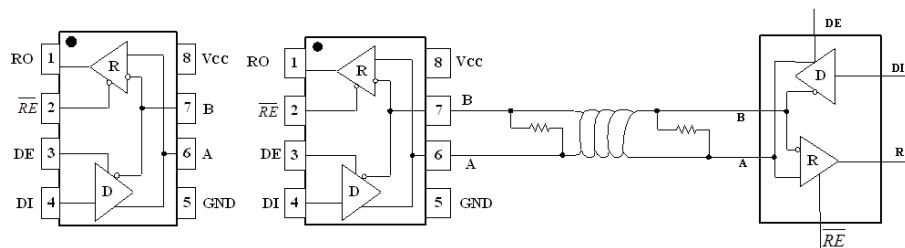
PIN	1	2	3	4	5	6	7	8	9	10
Definit ion	VCC	GND	G	TX3	RX3	G	TX2	RX2	TX1	RX1
Functi on	Power	RS23 2			RS23 2			RS23 2		
Node	9–24V /1A DC	/dev/tt ymx3			/dev/tt ymx2			/dev/tt ymx1		



RS232 vs. RS485 Differences

The device's RS232 uses standard 232 voltage levels and a 3-wire design (TXD, RXD, GND). It connects to PCs, data-acquisition devices, serial displays, sensors, etc. When wiring, connect TXD to the other device's RXD, RXD to its TXD, and GND to its GND.

RS485 differs physically: lines A and B are differential signal lines that together determine logic 0 and logic 1, so 485 devices should be connected A-to-A and B-to-B. To improve interference immunity, the A and B lines are internally pulled up to 5V, with an internal 120-ohm matching resistor.



RS485 transceiver / differential bus with matching resistors (RO, RE, DE, DI, Vcc, GND, A, B)

Button (Tact Switch)

Function	User-defined button
Node	/dev/input/event1
Remarks	Hidden / recessed button

LED

Function	User-defined; controls LED indicator state for simple local status indication
Node	/dev/user_gpio

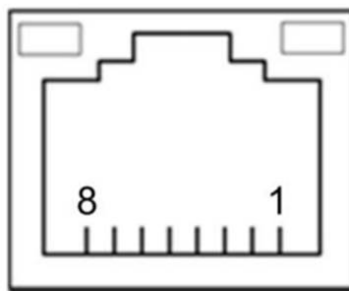
Numbering	NET: GPIO5_4; STATUS: GPIO1_26
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Note: RS485 and RS232 use the same software protocol layer, so application-layer operations are identical to RS232.

Network Port

Standard RJ45 interface, IEEE 1588 compliant, 10/100 Mbps auto-negotiating Ethernet, with 15KV air-discharge and 8KV contact-discharge protection.

The device provides hardware network acceleration to speed up common protocols such as IP, TCP, UDP, and ICMP, reducing software overhead. It can be used in NICs, routers, and switches, and supports Remote Network Monitoring (RMON) counters per IETF RFC 2819.



RJ45 connector (pins 1–8)

Pin 1 / 2 / 3	TX+ (Transmit+) / TX- (Transmit-) / RX+ (Receive+)
Pin 6	RX- (Receive-)
Pins 4, 5, 7, 8	NC (unused)

4G Mobile Communications

Standards	TDD-LTE / FDD-LTE / EVDO / WCDMA / TD-SCDMA / CDMA1X / GPRS / EDGE Selectable modules (EC20, MU709s, H330S, L710-CN); compatible with China Telecom, China Mobile, China Unicom
Theoretical Bandwidth	FDD LTE: 100 Mbps down / 50 Mbps up TDD LTE: 61 Mbps down / 18 Mbps up CDMA2000 1X EVDO Rev A: 3.1 Mbps down / 1.8 Mbps up WCDMA: 42 Mbps down / 5.76 Mbps up
Transmit Power	< 24 dBm
Receive Sensitivity	< -109 dBm
SIM Card Interface	USIM interface per ISO 7816-3; supports Class B and Class C USIM
Remarks	Actual parameters refer to the 4G module datasheet

WiFi

Compliant with IEEE 802.11n; compatible with 802.11g/b. Provides a USB 2.0 interface (compatible with USB 1.1/2.0). Supports 64/128-bit WEP and WPA-PSK/WPA2-PSK / WPA/WPA2 security. Uses 11N technology for wireless rates up to 150 Mbps.

Protocols/Standards	IEEE 802.11n/b/g, 802.3, 802.3u
Frequency Range	2.4–2.4835 GHz ISM band
Spread Spectrum	DSSS (Direct Sequence Spread Spectrum)
Operating Modes	Infrastructure (centralized) and Ad-Hoc (peer-to-peer)
Transmission Rates	1, 2, 5.5, 6, 11, 12, 18, 22, 24, 30, 36, 48, 54, 60, 90, 120, up to 150 Mbps
Modulation	OFDM / DBPSK / DQPSK / CCK
Channels	14
Transmit Power	< 13 dBm @11n, < 18 dBm @11b, < 14 dBm @11g
Receive Sensitivity	11 Mbps: -86 dBm@8%; 54 Mbps: -73 dBm@10%; 130 Mbps: -66 dBm@10%
Antenna	External antenna
RF Input Impedance	50 Ω
Range	Up to 100 m indoors, up to 300 m outdoors (environment dependent)

WiFi Parameters (Summary)

Standards & Bands	IEEE 802.11b/g/n, 2.4G
Transmission Rate	802.11b: up to 11 Mbps; 802.11g: up to 54 Mbps; 802.11n: up to 150 Mbps
Security/Encryption	WEP, WPA, WPA2, and others
Transmit Power	15 dBm (maximum)
Receive Sensitivity	< -70 dBm @ 54 Mbps
Mode	Station / AP mode

TF Card Slot

Used for capacity expansion and system updates. Supports high-capacity storage and hot-plug detection. Supports eMMC protocol 4.3 and SD Memory Card protocol v2.0.

The TF/MMC card is a high-capacity, cost-effective, compact storage card with a simple access interface, widely used in cameras, MP3 players, phones, and storage devices. It features low power consumption and non-volatility. The TF interface is backward compatible with MMC; SD/MMC cards can be accessed in SD bus mode or SPI bus mode.

RTC (Hardware Clock)

To ensure accuracy and low power consumption, an external independent RTC is recommended. The device uses the PCF8563T RTC chip (low current $\sim 0.48 \mu\text{A}$ / 3.0V — the source prints “0.48 A”, almost certainly a typo for microamps). The CPU reads the RTC time via I2C.

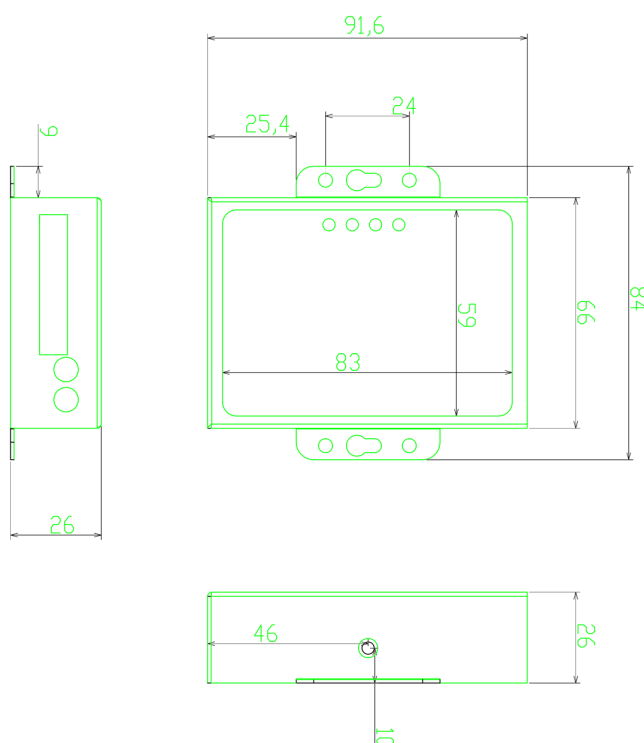
Interface / Node	/dev/rtc0
Chip	PCF8563T
Remarks	Internal coin-cell battery: 3V CR1220



CR1220 3V lithium coin cell

Product Dimensions

Unit: mm



Overall: 91.6 (W) × 84 (H) × 26 (D); bracket hole spacing 24, offset 25.4, thickness 6 Body: 83 wide; 59 / 66 reference heights; side: 46 ref, 10 hole, 26 depth Note: basic-parameters table lists 90×65×25 mm (device only); the drawing includes the mounting bracket

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

1. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID: 2BWSI-DTU702

The product is equipped with a built-in LTE module that has obtained FCC certification.

Module FCC ID: XMR202008EC25AFXD