User Manual

Model:Ethernet-Gateway

Gateway is a combination of Bluetooth + Ethernet modules, which can communicate with any BLE compatible device and transfer the data to the server using the on board Ethernet module.

Basically the communication between the Bluetooth module and the Ethernet module happens via UART.

USR-TCP232-T2 is a tiny size serial TTL UART to Ethernet module which can realize data bidirectional transparent transmission between TTL and RJ45 port. It can also be applied in rs232/ rs485 by level shift circuit. USR-TCP232-T2 is based on Cortex-M0 core. It has characters of low power, fast speed and high efficiency.

The BLE section contains a 32-bit ARM Cortex-M3 processor that runs at 48 MHz as the main processor and a rich peripheral feature set that includes a unique ultralow power sensor controller. This sensor controller is ideal for interfacing external sensors and for collecting analog and digital data autonomously while the rest of the system is in sleep mode.

The Bluetooth Low Energy controller and the IEEE 802.15.4 MAC are embedded into ROM and are partly running on a separate ARM Cortex-M0 processor. This architecture improves overall system performance and power consumption and frees up flash memory for the application.

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BLE Key Features

- Wide Supply Voltage Range
    - Normal Operation: 1.8 to 3.8 V
    - External Regulator Mode: 1.7 to 1.95V
- Active-Mode RX: 5.9 mA
- Active-Mode TX at 0 dBm: 6.1 mA
- Active-Mode TX at +5 dBm: 9.1 mA
- Active-Mode MCU: 61 µA/MHz
- Active-Mode MCU: 48.5 CoreMark/mA
- Active-Mode Sensor Controller: 8.2 µA/MHz
- Standby: 1 µA (RTC Running and RAM/CPU
- Retention)
- Shutdown: 100 nA (Wake Up on External Events)
- Powerful ARM® Cortex®-M3 with 275KB of
- Nonvolatile Memory Including 128KB of In-System
- Programmable Flash
- Up to 28KB of System SRAM, of Which 20KB is
- Ultra-Low Leakage SRAM
- 8KB of SRAM for Cache or System RAM Use
- External Serial Flash Memory 512Kb with 4Kb sectors and Dual I/O SPI.
- Peripherals
    - 12-Bit ADC, 200-ksamples/s, 8-Channel Analog MUX
    - 15 GPIOs.
    - Real-Time Clock (RTC)
    - UART
    - 2× SSI (SPI, MICROWIRE, TI)
    - I2C
    - I2S
    - AES-128 Security Module
- Extensive development tools including IAR Embedded Workbench & Code Composer Studio.
- On-chip internal DC-DC Converter

Ethernet Key Features

- USR-TCP232-T2 is a tiny size serial TTL UART to Ethernet module which can realize data bidirectional transparent transmission between TTL and RJ45 port.
- Support DNS function
- Support DHCP, automatically obtain an IP address and query IP address through serial setting protocol
- Set parameter through webpage and serial AT command
- Serial port baud rate from 600 bps to 460.8 Kbps, Check bit of None, Odd, Even, Mark and Space
- Upgrade firmware via network
- Work mode: TCP Server, TCP Client, UDP Client, UDP Server, HTTPD Client
- Auto-MDI/MDIX, RJ45 port with 10/100Mbps.
- Restore factory default
- Heartbeat package mechanism to ensure connection is reliable, put an end to dead link
- User-defined registration package mechanism, check connection status and use as custom packet header
- The global unique MAC address bought from IEEE, user can define MAC address
- Across the gateway, switches, routers
- Support virtual serial port and provide corresponding software USR-VCOM
- Under TCP Server mode, Client number ranges from 1 to 16; default number is 4
- Can work in LAN, also can work in the Internet
- Provide PC TCP/IP socket programming example such as VB, C++, Delphi, Android and IOS
- Support customization

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Specifications

Radio	
BLE Frequency	2.402 GHz to 2.480 GHz
BLE Compatibility	4.2 and 5 specifications
BLE Data Rate	1Mbps
BLE Modulation	GFSK
BLE Sensitivity	-97dBm
Microcontroller	
BLE section Microcontroller Core	Powerful ARM® Cortex® -M3
Ethernet Section Microcontroller Core	ARM
Clock Speed	Up to 48 MHz
Flash Size	128KB
Ethernet Flash Size	32KB
BLE RAM size	8KB SRAM
GPIO of BLE	15
Ethernet Module	
Rate	10/100 Mbps, MDI/MDIX, auto switch between cross and direct connection
Interface Standard	RJ45
Port Number	1
Network Protocol	IP, TCP, UDP, DHCP, DNS, HTTP, ARP, ICMP
Protection	2KV electromagnetism isolation
Buffer	Send: 6K bytes Receive: 4K bytes
Size	55 x 22.6 x 23.1 mm
Operating Temp.	-25 ~ 75°C
Storage Temp.	-40 ~ 105°C, 5 ~ 95% RH
Input Voltage	DC 3.3V/5V
Working Current	150mA

Specifications

Ethernet Module	
Interface Standard	TTL
Data Bit	5, 6, 7, 8
Stop Bit	1, 2
Check Bit	None, Even, Odd, Space, Mark
Baud Rate	600 bps ~ 460.8 Kbps
Buffer	Receive: 800 bytes
Electrical	
BLE Supply Voltage for BLE	1.8V - 3.8V
BLE Supply current, Active-Mode TX 0_DBM	6.1mA
BLE Supply current, Active-Mode RX	5.9mA
BLE Supply Current, Standby State	1 µA (RTC Running and RAM/CPU Retention)
BLE Module Operating Temperature	-40 - 85 °C

FCC Warning

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.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.