

## AT32F407/437 LWIP RT-Thread

## Introduction

This sample code demonstrates how to run LwIP protocol stack on RT-Thread and build UDP echo server.

Applicable products:

|             |            |
|-------------|------------|
| Part number | AT32F407xx |
|             | AT32F437xx |

List of peripherals:

|                  |       |
|------------------|-------|
| Main peripherals | EMAC  |
|                  | GPIO  |
|                  | USART |

# 1 Application method

## 1.1 Hardware requirements

- 1) LED2/LED3
- 2) USART1(PA9/PA10)
- 3) AT-START-F407/ AT-START-F437 evaluation board
- 4) Ethernet cable

## 1.2 Software requirements

- 1) APP\_Release
  - Network debugging assistant
- 2) SourceCode
  - at32f407\_rt-thread/ at32f437\_ rt-thread source code
  - rt-thread source code
  - LWIP source code
  - AT32 driver library
- 3) Doc
  - SC0085\_AT32F407\_437\_LWIP\_RT-Thread\_V2.0.2

*Note: All projects are built around keil 5. If users want to use them in other compiling environments, please refer to AT32F407\_Firmware\_Library\_V2.x.x/project/at\_start\_f407/templates (such as IAR6/7, keil 4/5) for a simple change.*

## 1.3 Example of application

- 1) Open at32f407\_ rt-thread / at32f437\_ rt-thread, compile and download to the evaluation board;
- 2) Configure the IP address segment of the PC to be the same as that of the evaluation board, as shown in Figure 1;
- 3) Open the network debugging assistant, and enter the local and remote IP addresses;
- 4) Enter the string to be sent; then the evaluation board receives the string and transmits the same content to the host, as shown in Figure 2.

In daily application, this routine realizes hot swap and calls *ethernetif\_set\_link* function to perform corresponding LWIP processing on the network connection status.

*Note: If the data received and sent by the network port is occasionally lost, check whether the amount of code exceeds the zero-wait area of the chip. In this case, users can selectively compile important codes into the zero-wait area.*

Figure 1. Set PC network segment

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

Obtain an IP address automatically

Use the following IP address:

|                  |                     |
|------------------|---------------------|
| IP address:      | 172 . 31 . 96 . 51  |
| Subnet mask:     | 255 . 255 . 255 . 0 |
| Default gateway: | 172 . 31 . 96 . 254 |

Obtain DNS server address automatically

Use the following DNS server addresses:

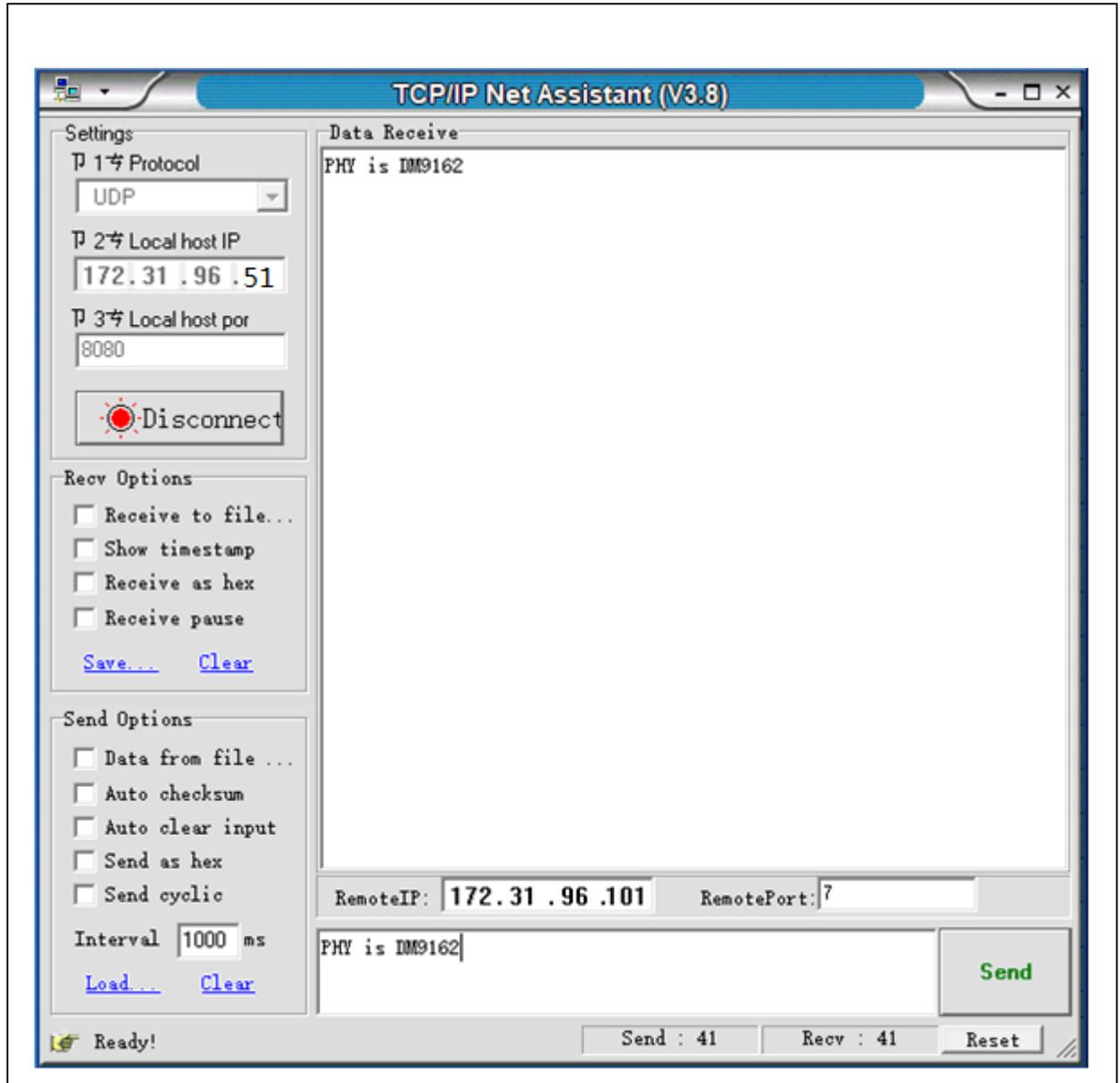
|                       |                      |
|-----------------------|----------------------|
| Preferred DNS server: | 192 . 168 . 31 . 224 |
| Alternate DNS server: | 192 . 168 . 31 . 228 |

Validate settings upon exit

Advanced...

OK Cancel

Figure 2. Host sends a string and receives feedback from evaluation board



## 2 Revision history

Table 1. Document revision history

| Date       | Version | Revision note  |
|------------|---------|--|
| 2022.04.06 | 2.0.0   | Initial release.   |
| 2022.04.15 | 2.0.1   | 1. Rectified the print warning during LWIP operation;<br>2. Added network connection status detection feature. |
| 2022.11.23 | 2.0.2   | Modified related description.  |

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