

A group of Network Communication Training System YERT-5000 / YWLAN-TS-1000

Wireless LAN Training System



YWLAN-TS-1000

Embedded Network programming and Configuration



YERT-5000

Y WLAN-TS-1000 Specifications

1) Wi-Fi Evaluation Board

- Wireless

| Item | Description |
|---------------------|---|
| Wireless Standard | IEEE802.11 b/g/n |
| Frequency Range | 2.412~2.477GHz |
| Output Power | 18dBm@1Mbps, 16dBm@11n MCS0, 14dBm@11n MCS7 |
| Receive Sensitivity | -97dBm@1Mbps, -93dBm@11n MCS0, -75dBm@11n MCS7 |
| Data Rates | Max 72Mbps |
| Modulation Type | OFDM, DSSS |

- Hardware

| Item | Description |
|-----------------------|---|
| Interface | UART(3.3V TTL Level, no flow control), SPI, GPIO |
| Temperature Operation | -40 ~85 |
| Humidity Operation | 10% to 90%, Non-Condensing |
| Serial | UART : 115200bps (default) SPI supported for high speed connection |
| Supply Voltage | DC2.7V~3.6V |

- Software

| Item | Description |
|----------------|--|
| Serial | Command |
| Format | AT Command Set |
| Operation Mode | Infra-structure, Access Point |
| Protocol | ARP, UDP, TCP, ICMP, DHCP server, DHCP client, HTTP |
| WiFi Security | WEP 64/128bit, WPA/WPA2 personal |
| API | TBD |

Y WLAN-TS-1000 Training contents

- Part 1. Introduction to Wireless LAN technology
 - Chap 1. Introduction to Wireless LAN
 - Chap 2. Wireless LAN Fundamentals
 - Chap 3. Wireless LAN Technology(IEEE802.11 b/g/n)
- Part 2. System Experimental Environment
 - Chap 4. System configuration and setting
 - Configuration and setting of wireless experimental boards
 - Configuration and setting of protocol analyzer
- Part 3. WLAN packet structure and protocol analysis
 - Chap 6. WLAN packet analysis
 - Chap 7. WLAN search protocol analysis
 - Chap 8. WLAN certification protocol analysis
 - Chap 9. WLAN conjunction protocol analysis
 - Chap 10. WLAN internet protocol analysis

Y WLAN-TS-1000 is a training system to educate the basic WLAN technology, WLAN protocol analysis, integrated operation with peripheral devices.

Wireless LAN Training System is a advanced technology education equipment for Wi-Fi environment set-up experiment and protocol analyzing training through lessons about Wireless LAN (802.11 b/g) concept and experimental environment configuration practices.

Y WLAN-TS-1000 Components

| | |
|------------------------|--------|
| WLAN Evaluation board | 2 ea |
| WLAN Protocol Analyzer | 1 ea |
| Wi-Fi Access Point | 1 ea |
| WLAN Card | 1 ea |
| Textbook | 1 book |

2) Access Point

- Hardware

| Item | Description |
|--------------------|---|
| WAN Interface | 1 10/100BASE-TX Ethernet port for cable or DSL modem or private Ethernet line |
| LAN Interface | 4 10/100BASE-TX Ethernet ports |
| WLAN Interface | 2.4GHz : IEEE 802.11b/g/n 5GHz : IEEE 802.11a/n, IEEE 802.11ac draft |
| USB Interface | Micro-USB 2.0 type A port for power supply |
| Frequency Range | 802.11a, 802.11b/g/n, 802.11ac draft |
| Modulation Schemes | 802.11a: BPSK, QPSK, 16QAM, 64QAM with OFDM 802.11b: DQPSK, DBPSK, DSSS, CCK 802.11g: BPSK, QPSK, 16QAM, 64QAM with OFDM 802.11n: BPSK, QPSK, 16QAM, 64QAM with OFDM 802.11ac draft: BPSK, QPSK, 16QAM, 64QAM, 256QAM with OFDM |

- software

| Item | Description |
|------------------------------|--|
| Operation Modes | Router mode Access point mode |
| Network Functions | WAN connection types: PPPoE, Static IP, Dynamic IP, PPTP/L2TP + Static IP, PPTP/L2TP + Dynamic IP DHCP server/client/relay DNS relay VPN pass-through (PPTP/L2TP) Dynamic DNS Static IP routing Remote management Network statistics for each interface IGMP Proxy RIP UPnP Support of VLAN Flow control TR-069 client WAN ping respond Support of SIP Support of RTSP |
| Wireless Connection | Supported security settings: WEP, WPA/WPA2 Personal, WPA/WPA2 Enterprise MAC filter Managing connected stations PIN and PBC methods of WPS WMM (Wi-Fi QoS) Advanced settings "Client" function (router mode) : WISP repeater "Client" function (access point mode) : Wireless network client, Wireless network repeater |
| Firewall Functions | Network Address Translation (NAT) Stateful Packet Inspection (SPI) IP filters MAC filter URL filter DMZ Prevention of ARP and DDoS attacks Virtual servers |
| Configuration and Management | Multilingual web-based interface for configuration and management Access via TELNET Firmware update via web-based interface Automatic notification on new firmware version Saving/restoring configuration to/from file Support of remote logging Automatic synchronization of system time with NTP server and manual time/date setup Ping function Traceroute utility |

3) Wireless LAN Protocol Analyzers

| Item | Description |
|--------------------|--|
| Capture Capability | Full 802.11 Capture and upper layer protocols |
| Frequency Bands | b/g/n. |
| Operating Systems | Windows XP Etc : Channel switching capability |

4) Wireless LAN Card

* IEEE 802.11b/g, 802.11n (draft 2.0) compatible

Embedded Router Trainer

Model: YERT-5000

CE [November 17, 2010]



YERT-5000 Features

This is an educational equipment which enables user to have training over Network Configuration and Embedded Programming Practice on Internet Environment.

- 1) Embedded programming practice of TCP / IP protocol suite
- 2) Network configuration practice based on Router
- 3) TCP / IP protocol analysis
- 4) Embedded program porting practice

YERT-5000 Training contents

Vol. Embedded Network Programming Experiments (for ERT-5000N)

- Part I Embedded Network and Environment
- Chapter 01 Introduction to Routing Network System
 - Chapter 02 Network Configuration Method
 - Chapter 03 Introduction to ERT-5000 and Hardware
- Part II Software Practice Environment of Embedded Network Board
- Chapter 04 System Installation
 - Chapter 05 Loading and Debugging Environment
- Part III Basic Practice for Embedded Programming
- Chapter 06 Practice for Demo Programming
 - Chapter 07 Practice for Packet Transmission Programming
 - Chapter 08 Practice for Packet Transmission and Receive Programming
- Part IV Practice for Embedded Programming Application
- Chapter 09 Practice for Hyper-terminal Command Programming
 - Chapter 10 Practice for Ethernet Interface Setting Programming
 - Chapter 11 Practice for Ethernet Protocol Programming
 - Chapter 12 Practice for ARP Programming
 - Chapter 13 Practice for IP Programming
 - Chapter 14 Practice for Ping Programming

Vol. Embedded Router Experiments (for ERT-5000R)

- Part I Embedded Router and It's Environment
- Chapter 1 Introduction to Routing System
 - Chapter 2 Network Building Technique
- Part II Practice of Static Routing
- Chapter 3 What are Default Route and Static Route
 - Chapter 4 Practice of Default Route and Static Route Operation
 - Chapter 5 Practice of Default Route and Static Route Programming
- Part III Practice of Firewall
- Chapter 6 What's fire wall
 - Chapter 7 Practice of fire wall Operation
 - Chapter 8 Practice of fire wall Programming
- Part IV Practice of RIP Routing
- Chapter 9 What is RIP Routing Lab
 - Chapter 10 Practice of RIP Routing Operation
 - Chapter 11 Practice of RIP Routing Programming
- Part V OSPF Routing Test
- Chapter 12 VLSM and Aggregation
 - Chapter 13 What's OSPF routing
 - Chapter 14 Practice of OSPF routing Operation
 - Chapter 15 Practice of OSPF routing Programming

YERT-5000 Software Program

- 1) Software Program for Manual 1
 - DEMO Program
 - ARP Program
 - IP Program
 - Ping Program
- 2) Software Program for Manual 2
 - Static Routing Program
 - RIP Routing Program
 - OSPF Routing Program
 - Firewall Program

YERT-5000 Components

| | | | |
|------------------------------|------|--------------|------|
| • Main body | 1 ea | • LAN Cable | 4 ea |
| • Textbook | 2 ea | • UART Cable | 1 ea |
| • Program CD(Multi-media CD) | 1 ea | • AC Cable | 1 ea |
| • Print Cable | 1 ea | • USB Cable | 1 ea |

YERT-5000 Functions

- 1) Understanding the concept of Network and Router
- 2) Hardware practice of embedded Network and router
- 3) ERT-5000N
 - Link and Compile of Application Program and RTOS
 - Loading and Verification of compiled program
- 4) ERT-5000R
 - Network Configuration Practice
 - RIP Router Configuration
 - Firewall Configuration
 - OSPF Router Configuration

YERT-5000 Specifications

| Items | specification |
|---------------|-------------------------------------|
| CPU | Intel PXA255 400MHz (ARM RISC Chip) |
| RAM | SDRAM - 64 Mbytes |
| ROM | Nor Flash - 4 Mbytes |
| Nand Flash | 64 Mbyte |
| Ethernet | CS8900 10 Mbytes 5 port |
| Serial port | Full UART 1 Port |
| AC Power | 100 / 220V 1.5A |
| USB Interface | Ver 2.0 |