

## ITS-101 Series

### INTERNET TCP/IP PROTOCOL TRAINING SYSTEM



HUBOX

The Internet has permeated among our daily life in every aspect, and it provides the fundamental connection with many state-of-the-art technology such as third-generation cell phones, video communication, and information appliances.

The core technology of the Internet is TCP/IP protocol suite. Understanding TCP/IP protocol suite is crucial to users of the Internet at all levels, and it facilitate better application of the Internet. Internet TCP/IP Protocol Training System is designed to meet this need.

There are seven layers of TCP/IP protocol, and from the second to the forth of which plays the key role in operating system kernels such as Linux and Windows which are difficult for users to understand. Internet TCP/IP Protocol Training System not only reveals the inner workings of TCP/IP protocol software, but also provides methods to modify the behavior of TCP/IP protocol software for experimental purpose.

#### FUNCTION

1. Send and observe TCP segments, IP datagrams, ICMP datagrams, UDP datagrams, and Ethernet frames
2. Can be configurable as a router or a host
3. Help observing IP routing by connecting to other ITS as a network
4. Provide an internal view of the TCP/IP protocol stack at layers 2 through 4 normally hidden in operating system
5. Provide a platform to install user-defined network message procedures for experiments

#### PLATFORM

- |                                |         |
|--------------------------------|---------|
| 1. Module: ITS-101             | 6 pcs.  |
| 2. RS-232 Cable                | 6 pcs.  |
| 3. Power Cord                  | 6 pcs.  |
| 4. HUBOX                       | 1 pc.   |
| 5. Crossover RJ45 Cable        | 6 pcs.  |
| 6. Straight through RJ45 Cable | 12 pcs. |
| 7. Software CD: Kcodes         | 6 pcs.  |
| 8. ITS Manual:                 | 6 pcs.  |

- (1) Laboratory WorkBook
- (2) Instruction Manual
- (3) Message - Driven Dataflow Language Reference Manual
- (4) MDDL Jumpstart



# Miro-Computer/Internet Educational Equipment

## ITS-101 SPECIFICATION

1. CPU: ARM9, Samsung, 32-bit RISC, 166 MHz
2. Flash ROM First Level: 512 Kbytes
3. Flash ROM Second Level: 2 Mbytes
4. SDRAM: 64 Mbytes (Data width 32 Bits) at 133 MHz
5. Timer/Counter: Six 16-bit multi-function
6. Watch Dog Timer: 8-bit
7. RS-232 port
8. Upgrade Button
9. LED: 10/100/Active
10. Ethernet: 2 ports, 10/100Mbps, RJ-45
11. Power Requirements: 100~240 V 50~60 Hz 60 VA max
12. Environment:
  - (1) Humidity:  $\leq 70\%$  Relative
  - (2) Operation Temperature:  $0^{\circ}\text{C} \sim 40^{\circ}\text{C}$
  - (3) Storage Temperature:  $-10^{\circ}\text{C} \sim 70^{\circ}\text{C}$

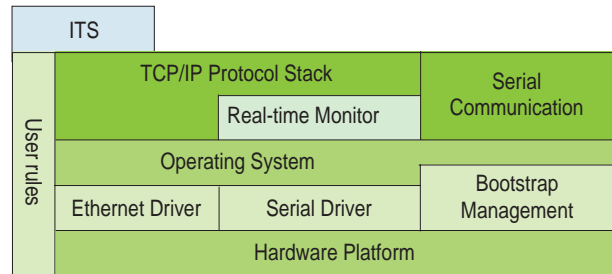
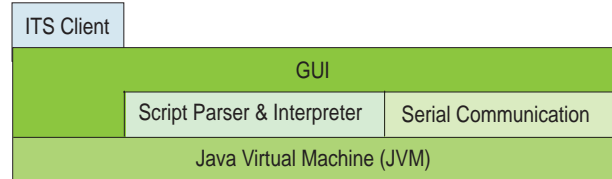
## HUBOX SPECIFICATION

- |                         |        |
|-------------------------|--------|
| 1. 6 Port RJ-45 Sockets | 2 pcs. |
| 2. 5 Port 10 Base Hub   | 2 pcs. |
| 3. AC Power Cord        | 1 pc.  |

## LABORATORY HIGHLIGHTS

1. Ethernet Messages Sending & Observing
2. MAC Address Discovery
3. Address Resolution Protocol (ARP)
4. ICMP Ping, and Checksum
5. IP Direct Delivery and IP Routing Using Default Gateway
6. IP Routing Using Next-Hop Routing
7. TTL in IP Routing
8. Trace of IP Routing
9. Path MTU Discovery
10. Network Disturbance for IP
11. Error Control
12. Sliding Window
13. Congestion Avoidance
14. Full TCP Implementation
15. TCP vs. UDP
16. Domain Name System
17. Echo
18. SMTP client
19. HTTP
20. Telnet
21. FTP
22. NAT
23. Firewall
24. Proxy ARP
25. IP Aliasing

## SOFTWARE MODULES



1. Embedded multitasking operating system
2. TCP/IP protocol stack
3. TCP/IP protocol stack real-time monitor
4. Bootstrap management
5. Serial communication and console management
6. Java-based graphical user interface client (GUI)
7. Parser and interpreter for protocol behavior specification script
8. Protocol Behavior specification scripts for the laboratory sessions