# A group of Bluetooth Telecom Training System

## YBT-2007 / YBT-3000

This equipment provides step-by-step instructions on bluetooth techniques from its basic program and hardware operation to commercial products of Bluetooth

Bluetooth™

Wireless control for Industrial products

YBT-3000

Equipment for experiment on Bluetooth communication

YBT-2007

Bluetooth™

# BLUETOOTH
# Telecom Trainer
## Model: YBT-2007

**An experimental equipment to educate Bluetooth technology for software protocol stack and hardware through step by step experiment.**

SIG : Approval [QPN-BMTK-040004]

## YBT-2007 Features

- Protocol Analysis and Simulation / Emulation
  - * Protocol Training
    - Protocol Processing Procedure
    - Protocol Learning
    - Protocol Signaling
  - * Profile Training
    - Profile Learning
    - Profile Signaling
    - Profile Processing Procedure
- Demo Function
  - Audio Conversation
  - File Transfer
  - Chatting
- Data Communication Experiment Using Various Interface. (USB, UART)
- Hardware Experiment is Available.
- Multi Purpose Usage. (Education, Research and Development)
- Bluetooth Host Programming.
- Options for Application.
- Full Documents.

Bluetooth

# BLUETOOTH Telecom Trainer

**Model: YBT-2007**

**YBT-2007 is An experimental equipment to educate Bluetooth technology forsoftware protocol stack and hardware operation procedure through step bystep experiment.**


## YBT-2007 Experiment Steps

1) Hardware Experiment : Theoretical and Practical Hardware training about Bluetooth Technology
2) HCI Protocol Experiment : Theoretical and Practical training on HCI Protocol
3) L2CAP Protocol Experiment : Theoretical and Practical training on L2CAP Protocol
4) RFCOMM Protocol Experiment : Theoretical and Practical training on RFCOMM Protocol
5) SDP Protocol Experiment : Theoretical and Practical training on SDP Protocol
6) Protocol Stack Experiment : Understanding Overall Structure of BT Protocol and Programming
7) Profile Stack Experiment : Understanding FTP Profile

# BLUETOOTH Telecom Trainer
## Model: YBT-2007

### YBT-2007 Training Contents

**Part I Introduction**
- Overview 1. What is Bluetooth
- Practice 1. Installation Settings & Application Software

**Part II Hardware**
- Practice 2. Power
- Practice 3. Interface
- Practice 4. Codec
- Practice 5. RF Module

**Part III Bluetooth Protocol Monitoring**

**I. HCI Protocol Monitoring**
- Practice 6. HCI Initialization and Inquiry
- Practice 7. HCI Connection
- Practice 8. HCI Disconnection
- Practice 9. HCI Data Transmission

**II. L2CAP Protocol Monitoring**
- Practice 10. L2CAP Connection
- Practice 11. L2CAP Disconnection
- Practice 12. L2CAP Data Transmission

**III. RFCOMM Protocol Monitoring**
- Practice 13. RFCOMM Connection
- Practice 14. RFCOMM Disconnection
- Practice 15. RFCOMM Data Transmission

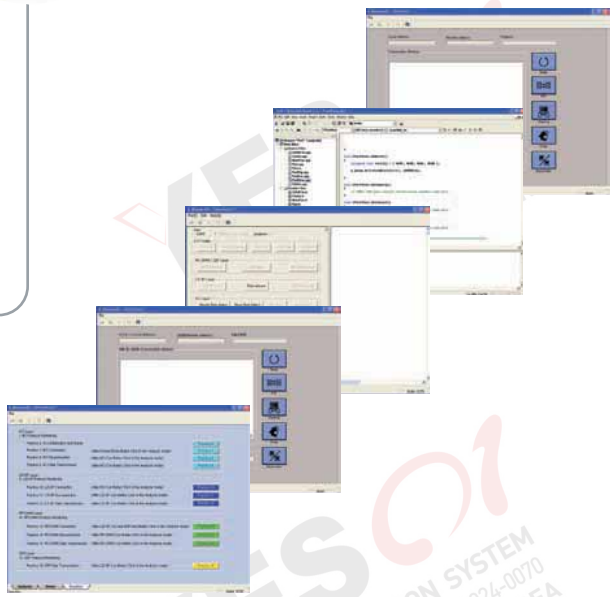
**VI. SDP Protocol Monitoring**
- Practice 16. Data Transmission between SDP Client and Server

**Part VI Bluetooth Protocol Emulation**
- Practice 17. Protocol Stack Emulation

**Appendix**

Appendix A. Monitoring Programming File Separation

Appendix B. References



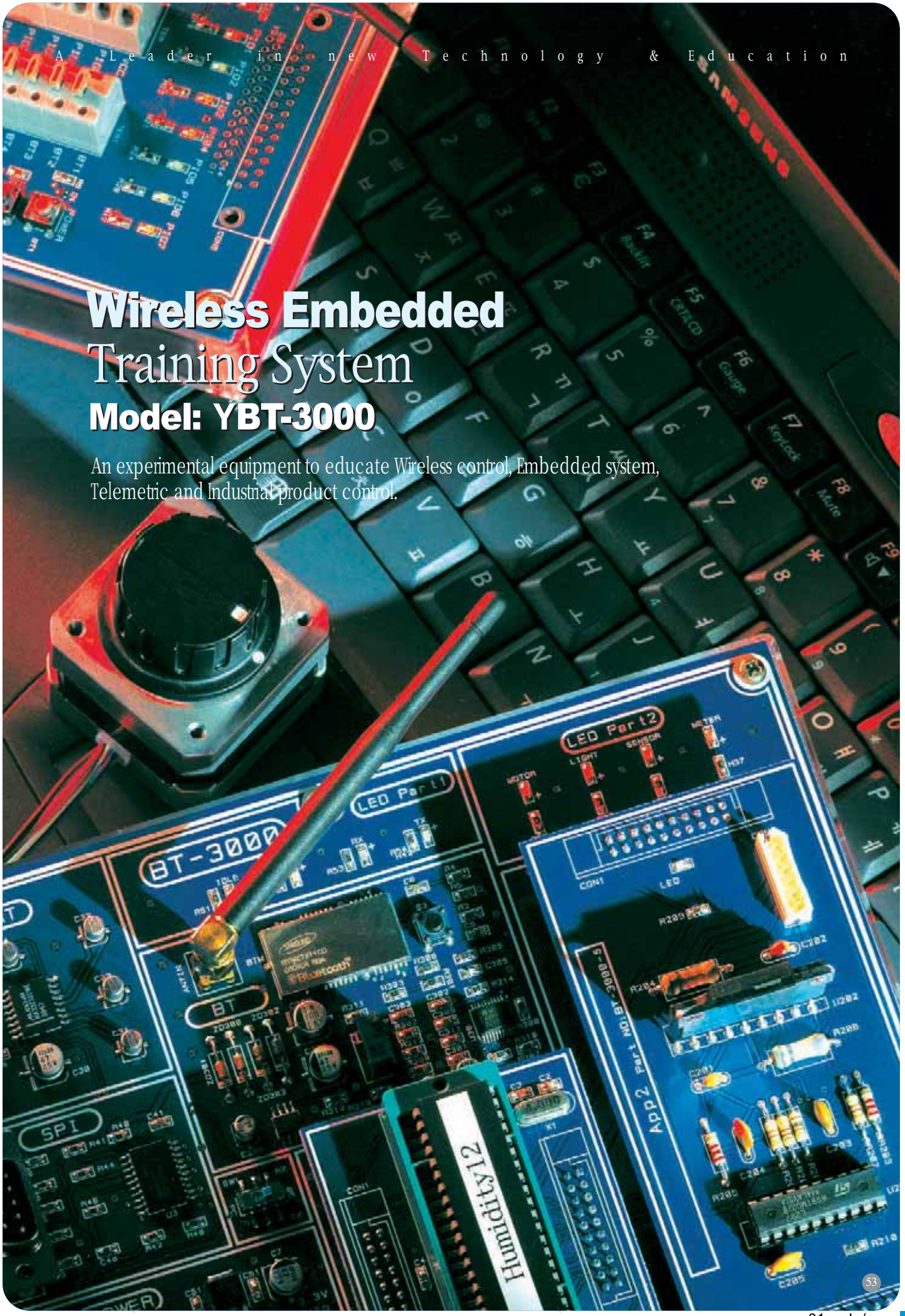
### YBT-2007 Components

| | | | |
|---|---|---|---|
| • Carriage Bag | 2 EA | • UART Cable | 2 EA |
| • Headset | 2 EA | • SPI Cable | 1 EA |
| • Adaptor(DC 9V/1.5A) | 2 EA | • Antenna | 2 EA |
| • Textbook | 1 EA | • BT module | 2 EA |
| • Program CD(Multi-media CD) | 1 EA | | |
| • Main body | 2 EA | | |
| • USB Cable | 2 EA | | |

### YBT-2007 Specifications

| Items | | Specifications |
|---|---|---|
| General | Bluetooth Firmware Version | HCI_V16.4 |
| | Bluetooth Specification Version | V1.1 |
| | Bluetooth Core chip | CSR BlueCore02-External |
| | Bluetooth Module | BlueSEM II |
| | Interface | UART, SPI, USB |
| | Codec Filter | 13bit Linear PCM |
| RF | Operating Frequency Range | 2402 ~ 2480 [MHz] |
| | Occupied Channel Frequency | 1 [MHz] |
| | Transmit Power Level | +4 [dBm] (Class 2) |
| | Receive Sensitivity | -80 [dBm] |
| | Antenna | Dipole |

* Spec can be upgraded anytime




# Wireless Embedded Training System

## Model: YBT-3000

An experimental equipment to educate Wireless control, Embedded system, Telemetric and Industrial product control.

## YBT-3000 Features

Wireless Embedded Training System, BT-3000 was developed to educate wireless control and embedded technology.
Its distinguished technology compared to wired embedded system is wireless control using Bluetooth protocol. Wireless embedded technology will be used in application of Home networking, Ubiquitous sensor networking, Telemetric and Industrial control in near future.
Through experiment using BT-3000 students learn hardware design and wireless communication protocol easily. Hardware design includes Controller and modules and software design including bluetooth communication protocol.

Wireless Embedded

## YBT-3000 Functions

- Embedded educational Training system by GUI control.
- Experiment of concentrated wireless embedded system using application module.
- General education to industrial embedded system.
- Software and Hardware training to each module.
- Experiment of Embedded programming using controller.
- Detail experiment using thirteen modules.
- Experiment of communication protocol Programming.
- Manufacturing of sensor hardware module.

# Wireless Embedded Training System

**Model: YBT-3000**

**An experimental equipment to educate Wireless control and embedded Technology, application of Telemetric and Industrial product control.**

# Wireless Embedded Training System
## Model: YBT-3000

### YBT-3000 Training Contents

Part I. Introduction
- Chapter 1 Introduction to Wireless embedded System
- Chapter 2 Understanding of the PIC Microcontroller
- Chapter 3 Understanding of the Server Program and Its Operational principle
- Chapter 4 Understanding of the Bluetooth Technology

Part II. Basic Wireless
- Chapter 5 Inquiry Response to the wireless equipment
- Chapter 6 Connection to the wireless equipment
- Chapter 7 Wireless Data/Voice Communication
- Chapter 8 Disconnection to the wireless equipment

Part III. Wireless Application
- Chapter 9 Remote DC/STEP Motor Control
- Chapter 10 Remote Power/Current Control
- Chapter 11 Remote Temperature Sensor Control
- Chapter 12 Remote Infrared Sensor Control
- Chapter 13 Remote Touch Sensor Control
- Chapter 14 Remote Ultrasonic Sensor Control
- Chapter 15 Remote Gas Sensor Control
- Chapter 16 Remote Humidity Sensor Control
- Chapter 17 Remote Pressure Sensor Control

Reference
- A. Conn7 Pin Layout in the Slave board


### YBT-3000 Components

#### Main Server Package (BT-3000M)

| | | | |
|---|---|---|---|
| • Server hardware | 1 EA | • SPI cable | 1 EA |
| • Server program CD | 1 EA | • Textbook | 1 EA |
| • Bluetooth module | 1 EA | • Power adaptor(9V 1A, 50/60Hz) | 1 EA |
| • Antenna | 1 EA | • Carriage & Storage bag | 1 EA |
| • USB cable | 1 EA | • PIC16F877(DEMO) | 2 EA |
| • UART cable | 1 EA | • PIC16F877(PRACTICE) | 2 EA |
| • Ear-microphone | 1 EA | | |

#### Motor/Power Control Experiment Package(BT-3000SM)

| | | | |
|---|---|---|---|
| • Slave Hardware | 1 EA | • Antenna | 1 EA |
| • Light Control 1 | 1 EA | • DC Motor | 1 EA |
| • Current Control 2 | 1 EA | • Step Motor | 1 EA |
| • Controller module | 1 EA | • Power Adaptor(12V 1.5A, 50/60Hz) | 1 EA |
| • DC Motor experiment module | 1 EA | • Carriage & Storage Bag | 1 EA |
| • Step Motor Exp. module | 1 EA | • Ear-microphone | 1 EA |
| • UART Cable | 1 EA | • Electric bulb | 1 EA |
| • SPI Cable | 1 EA | | |

#### Sensor Control Experiment Package(BT-3000SS)

| | | | |
|---|---|---|---|
| • Slave hardware | 1 EA | • SPI Cable | 1 EA |
| • Temperature sensing control module | 2 EA | • Controller module | 1 EA |
| • Infrared sensor control module | 2 EA | • Antenna | 1 EA |
| • Touch sensor control module | 1 EA | • FAN motor | 1 EA |
| • Ultrasonic wave control module | 1 EA | • Power Adaptor(12V 1.5A, 50/60Hz) | 1 EA |
| • Gas sensor control module | 1 EA | • Carriage & Storage Bag | 1 EA |
| • Pressure sensor control module | 1 EA | • Ear-microphone | 1 EA |
| • Humidity sensor control module | 1 EA | | |
| • UART Cable | 1 EA | | |

### YBT-3000 RF Specifications

| | | |
|---|---|---|
| **RF Specifications** | **Chipset Maker** | CSR Core Chip Set (AirLogic Module) |
| | **Chipset specification** | Bluetooth Ver1.1 or 1.2 |
| | **Range** | 10m(Class2) |
| | **Interfaces** | UART, USB, SPI |

### YBT-3000 Sensor Specifications

| **Sensor specifications** | | | |
|---|---|---|---|
| **Types** | Temperature sensor ( two types ) | Temp. measurement (SMD type, Semiconductor type) | -40°~ 120° |
| | Infrared sensor ( two types ) | Transmitter / Receiver type, Detection type | 5 ~ 20 [㎛] , within 3 [m] |
| | Touch sensor | Application to Security | Response immediately |
| | Ultrasonic wave sensor | Application to Security | Within 10[m] |
| | Gas sensor | Application to Home automation | CO2 or Alcohol |
| | Humidity sensor | Application to Home automation | 0 ~ 100 [%] |
| | Pressure sensor | Application to Security | 10 [psi] |

### YBT-3000 Controller Specifications

| | | |
|---|---|---|
| **Controller Specifications** | **Chipset** | PIC16F877 or F74 |
| | **Speed** | 4 [MHz] ~ 20 [MHz] |
| | **Interfaces** | UART, I2C, SPI |
| | **Functions** | Interrupt, A/D converter, Timer |