

# Electric and Electronic Experiment

## HBE-B3E

### HBE-B3E

[Electric & Electronic Practice Equipment on Integrated Automatic Instrumentation]

Implement all the instructions for circuit practice in one equipment.

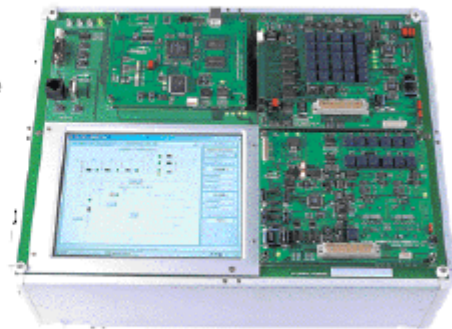
Check a practice course and results within the equipment.

Automate the wiring for experiment & measurement.

Help acquire a clear electronics theory through automation practice (AC signal analysis)

Practice GUI (Graphic User Interface) of Touch Screen mode

Carefully selected 50 types of electric & electronics practice themes



### HBE-B3E Features

Integrated automatic instrument-type practice unit equipped with an oscilloscope, function generator, power supplier and digital multimeter function necessary for experiments.

Apply the Embedded XP and conduct all the practices for displaying remotely measured values on the 8.4inch LCD Screen without external PC.

No need for external connections like probe by implementing a necessary switching and instrument environment (practice point) with Touch Screen. USB-based easy update

[Simulation-Verified Practice Circuit]

Configure a theory and practice appropriately in accordance with R, L, C element features.

Present a direction for easy theory acquisition.

Systematic learning through experiment modules by each unit

Better understanding & application

[Cultivating Troubleshooting Capacity]

Provide an essential electric & electronic necessary for understanding a circuit.

Cultivate a capacity for failure diagnosis and error correction by presenting key points during circuit operation.

[Integrated Automatic Instrumentation Practice Unit]

Automatic experiment data acquisition device

Provide the GUI of practice theme Promote better understanding by indicating a current process of a practice theme (Switching Point & Probe Point Indicator)

Check as witch status and signal's input/output status on a real-time basis.

[Optimized Solution without External Manipulation]

Provide an optimized practice environment in which every instrumentation probing status is manipulated with Screen Touch mode.

[Base Specification]

Main Control Block	Memory	Memory 1x200pin DDR sodimm SDRAM 512MB
	CPU	VIA Luke CoreFusion Processor
	USB	Port USB2.0 Host
	Ethernet	10/100 Base-T
	HardDisk	E-IDE I/F (CompactFlash Module 1GB)
	TFTLCD	8.4" (800x600), Touch Screen
	OS	Embedded XP
Power	Input	AC 115 ~ 230V / 50 ~ 60Hz
	Output	+5VDC, -5VDC/1A, +12VDC, -12VDC/1A, -35V ~ +35V/1A 2 Channel power supply -30V ~ +30V / 1A

[Instrumentation Specifications]

· Software Specifications

Digital Oscilloscope	Check & measure 2-channel waveform X-Y Scope Measuring : Frequency, Amplitude, Max/Min, Peak to Peak, RMS
Variable Power Supply	2-channel Power Supply (-30~+30) Current Limit setting (30V, 1A)
Digital Multi-Meter	Voltage/current, resistance, Diode, TR, RMS (AC)
Function Generator	2-channel triangular/spherical/sinusoidal wave output, Sweep function
Auto Switching	Visualization of short circuit & connection/operation

· Digital Oscilloscope Function

Channel	2 channel
Sampling ratio	40M S/s
Bandwidth	10MHz
Resolution	12 bit
Accuracy	±1%
Over-voltage	±100V
Buffer size	4M

· Variable Power Supply Function

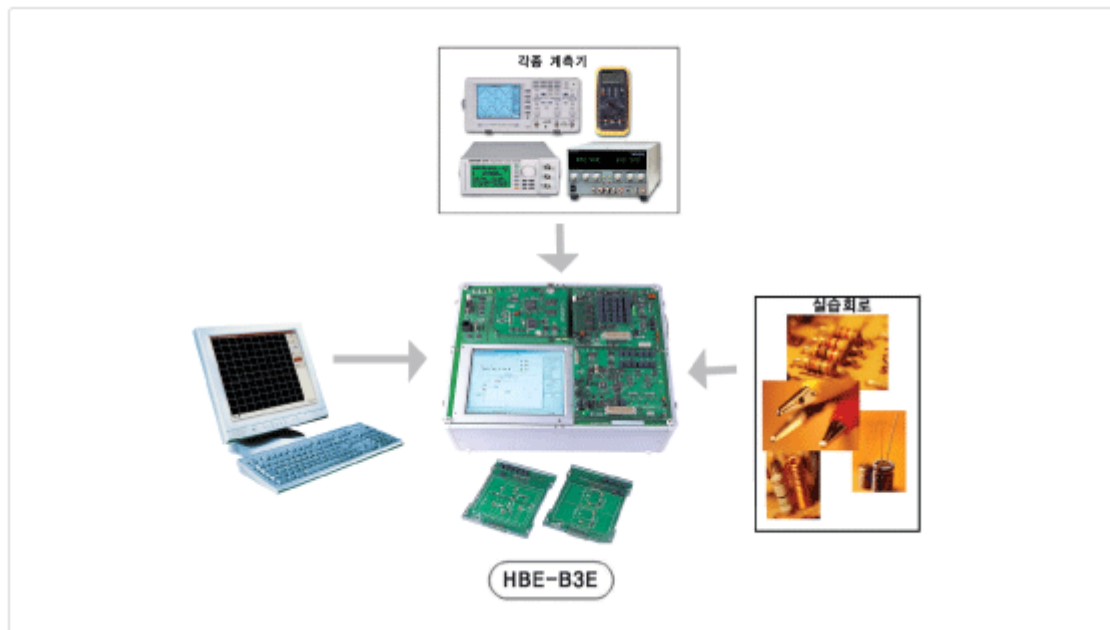
Number of Output	2CH
Output	Variable Power Supply (2ch -30V ~ +30V, 1A)
Stability	< 10mV
Temperature	1%/C
Ripple & Noise	< 10mV
Output Current	Max 1A
Resolution	100mV Step

[Digital Multi-Meter Function]

DC Voltage	Range : 20mV ~ 60V
	Resolution: 16Bit
	Accuracy: 2.5V~60V 0.1%
	Maximum Input Voltage : 65V
DC Current	Accuracy : 1%
	Range : 0.1mA ~20A ( at 2.5V )
	Resolution: 16Bit
	Accuracy : 1%
AC Voltage	Range : 20mV ~ 60V
	Resolution: 16Bit
	Accuracy: 2.5V ~60V 0.1%
	Maximum Input Voltage : 65V
AC Current	Accuracy : 1%
	Range : 0.1mA ~20A ( at 2.5V )
	Resolution : 16Bit
	Accuracy : 1%

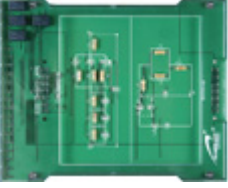
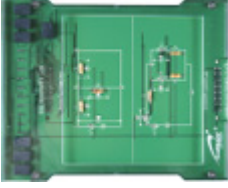
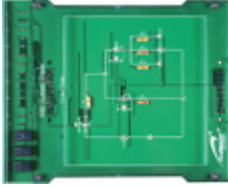
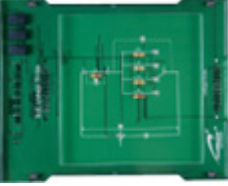
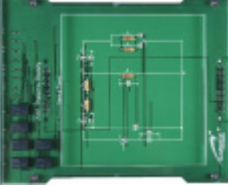
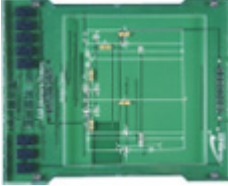
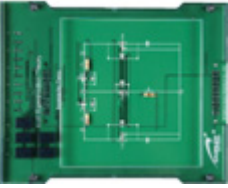
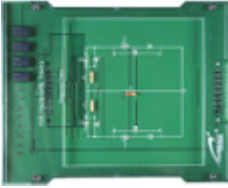
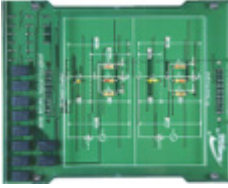
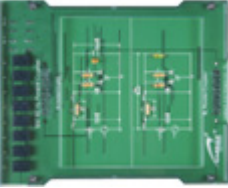
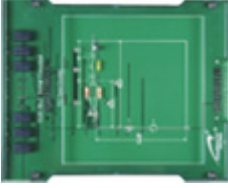
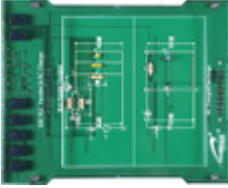
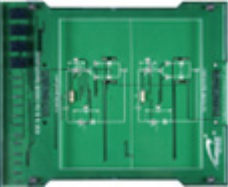
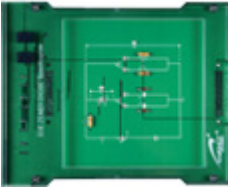
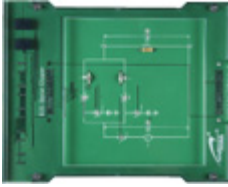
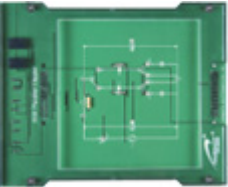
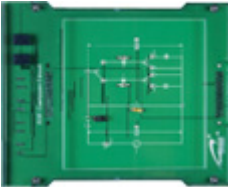
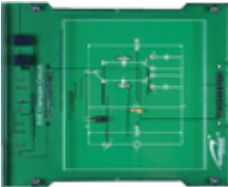
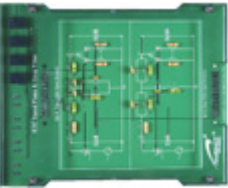
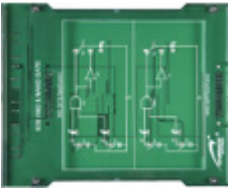
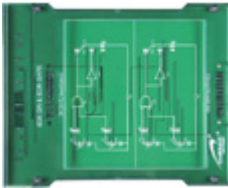
Number of Output Channels	2CH
Frequency Range	Sine: 1Hz ~ 1MHz, Square: 1Hz ~ 16MHz, Triangle: 1Hz ~ 5MHz
Control	Programmable on Embedded PC
Resolution	Sine: 1Hz ~ 1MHz, Square: 1Hz ~ 16MHz, Triangle: 1Hz ~ 5MHz
Attenuator	Single Pole: 20Vpp, Bipolar: 10Vpp/500mA
DC offset	-14 ~ +34dB
Sweep	% Adjustable
Signal Type	SINE, SQUARE, TRIANGLE

## Basic Configuration

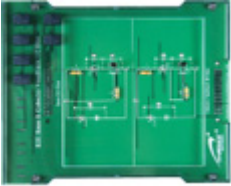
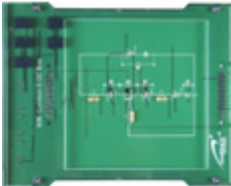
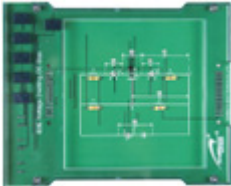
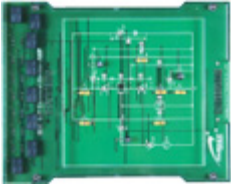
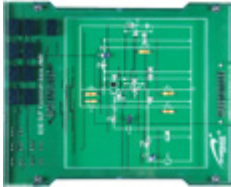
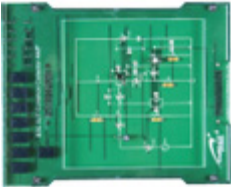
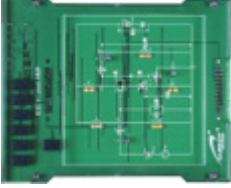
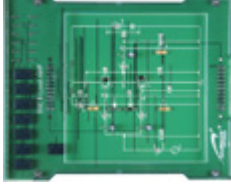
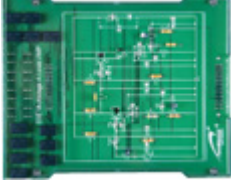
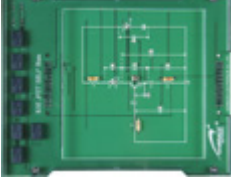
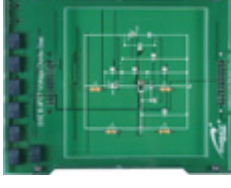
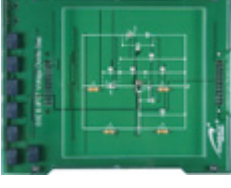
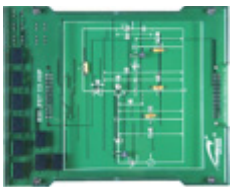
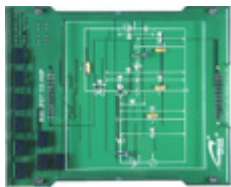
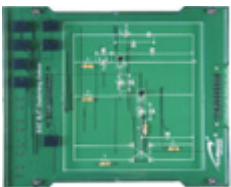
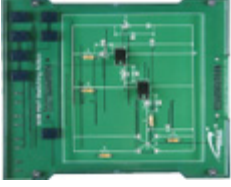
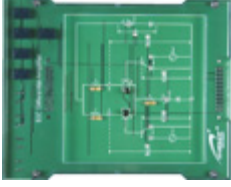
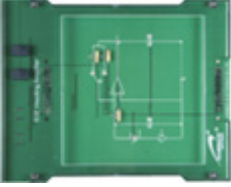
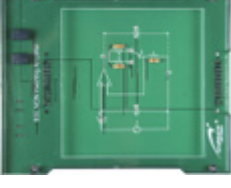
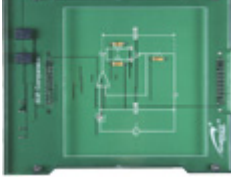
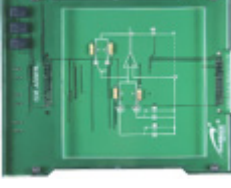


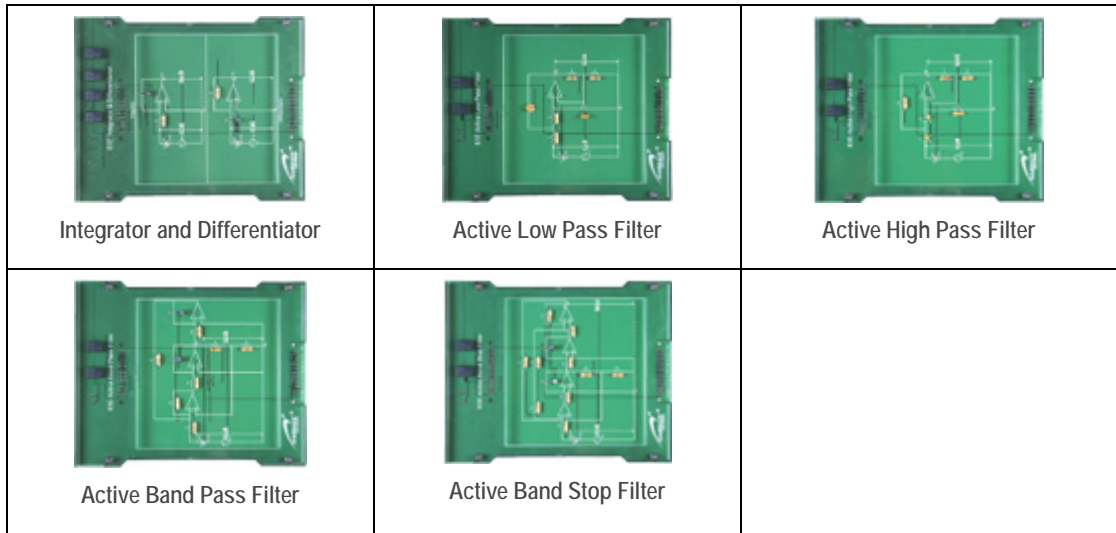
## Description on Experiment Theme(47 Option Modules)

### - BASIC CIRCUIT TEHME

		
Ohm's Law	Kirchhoff's Law	Current Dividing
		
Voltage Dividing	Thevenins Theorem	Nortons Theorem
		
Superposition Theory	Reciprocity Theorem	RC, RL Serial Coupled
		
RC, RL Parallel Coupled	RLC Serial Coupled	RLC Parallel Coupled, RC Time Constant
		
Si & Ge Diode Specification	Zener Diode Specification	Serial Clipper
		
Parallel Clipper	Clamper Circuit	Low Pass & High Pass Filter
		
Band Pass & Band Stop Filter	AND/NAND Gate	OR/XOR Gate

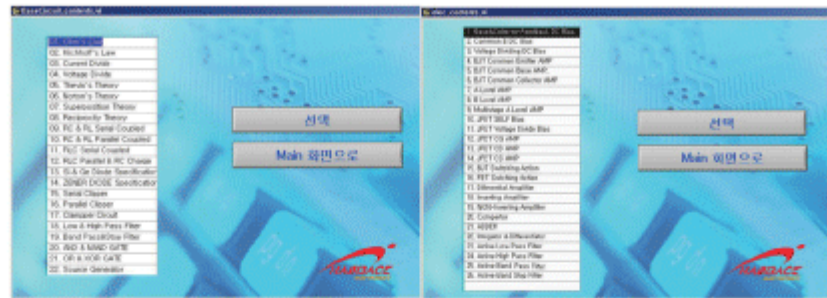
ELECTRONIC TEHMA

 <p>BJT CB &amp; CC Feedback DC Bias</p>	 <p>BJT CE DC Bias</p>	 <p>BJT Voltage Dividing DC Bias</p>
 <p>BJT Common Emitter Amplifier</p>	 <p>BJT Common Base Amplifier</p>	 <p>BJT Common Collector Amplifier</p>
 <p>BJT A Level Amplifier</p>	 <p>BJT B Level Amplifier</p>	 <p>BJT Multistage A Level Amplifier</p>
 <p>JFET SELF Biast</p>	 <p>JFET Voltage Divide Bias</p>	 <p>JFET Common Gate Amplifier</p>
 <p>JFET Common Drain Amplifier</p>	 <p>JFET Common Source Amplifier</p>	 <p>BJT Switching Action</p>
 <p>JFET Switching Action</p>	 <p>Differential Amplifier</p>	 <p>Inverting Amplifier</p>
 <p>Non-Inverting Amplifier</p>	 <p>Comparator</p>	 <p>ADDER</p>

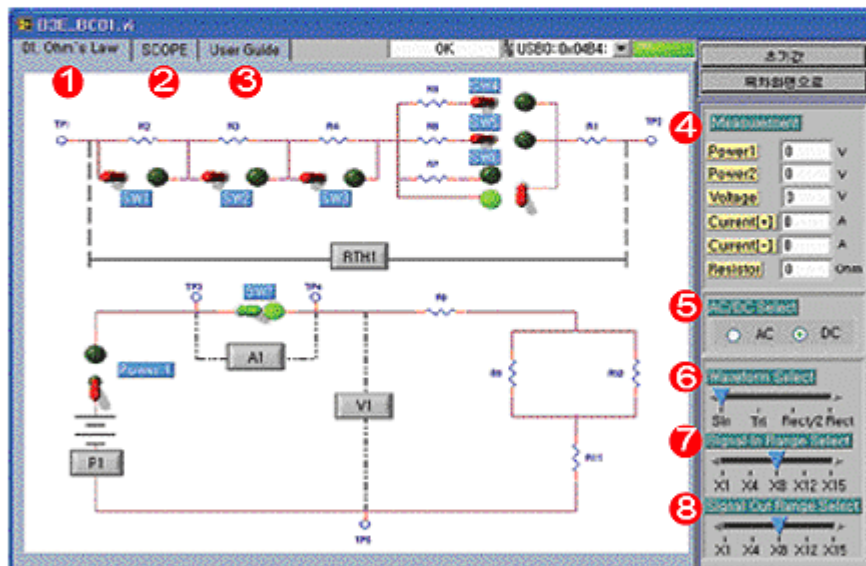


## Software

[Theme Selection]

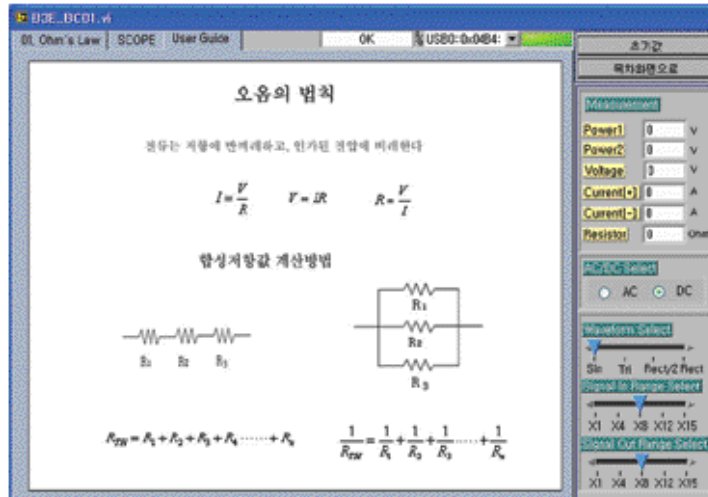


[Practice Screen]

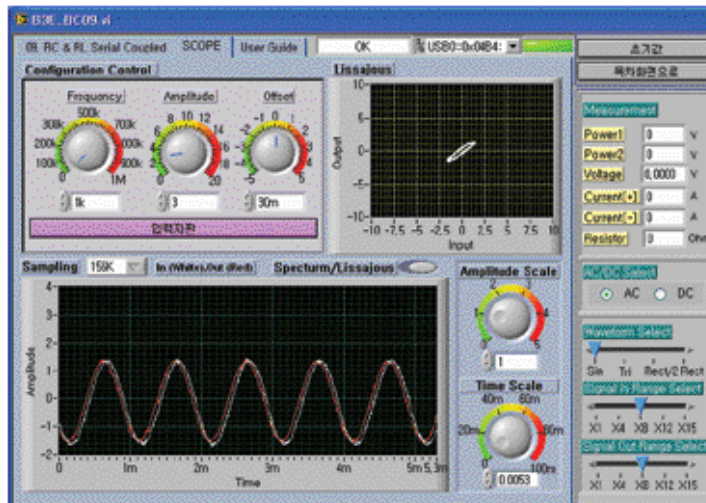


1. Practice Circuit Screen
2. OSC(Oscilloscope)
3. User Guide
4. Measurement
5. AC/DC Select
6. Waveform Select
7. Signal In Range Select
8. Signal Out Range Select

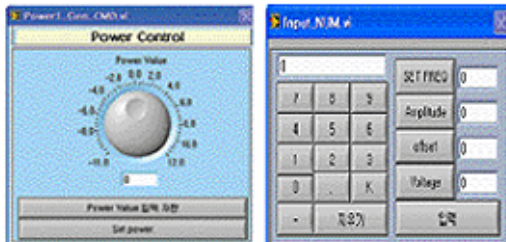
[Practice Guide]  
Guide for practice theme



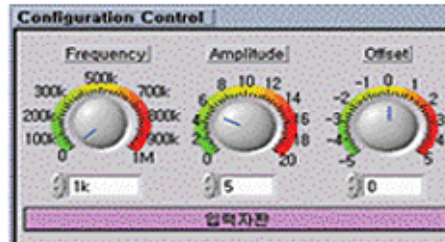
[Oscilloscope Sub Panel]  
2 ch Oscilloscope Sub Panel to measure practice results



[Power Control Sub Panel]  
Power supply control panel



[Source Control Sub Panel]  
Source supply control panel



Others

[Product Manual (Textbook Included)]

1. HBE-B3E operation manual : Hardware specification & environment setting
2. HBE-B3E practice manual : Experimental theme's theory, practice method, questions & answers.
3. HBE-B3E instruction manual : Practice guidelines