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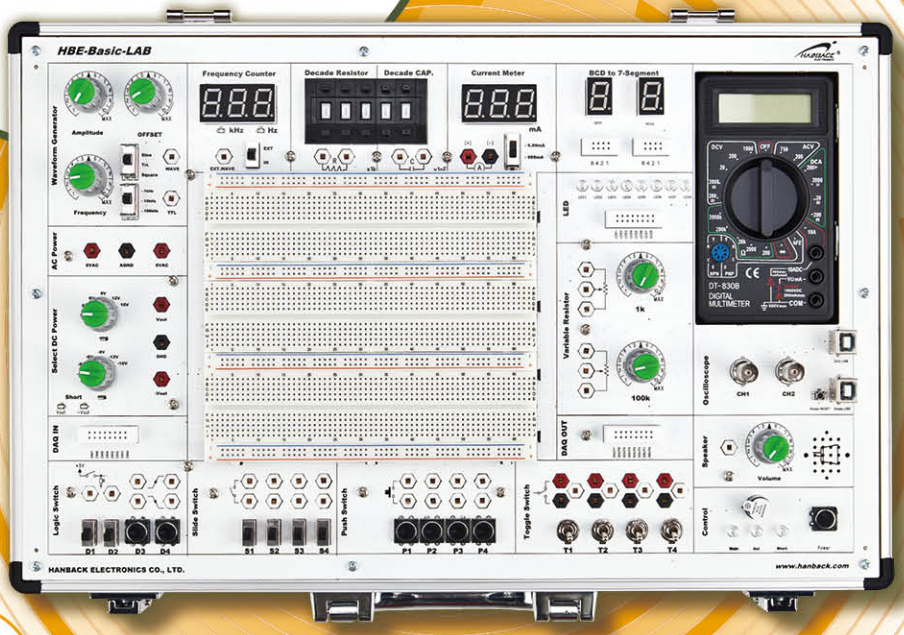
Analog Digital Training Equipment

Basic LAB

Analog

Digital



HANBACK ELECTRONICS

Since 1984

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Homepage

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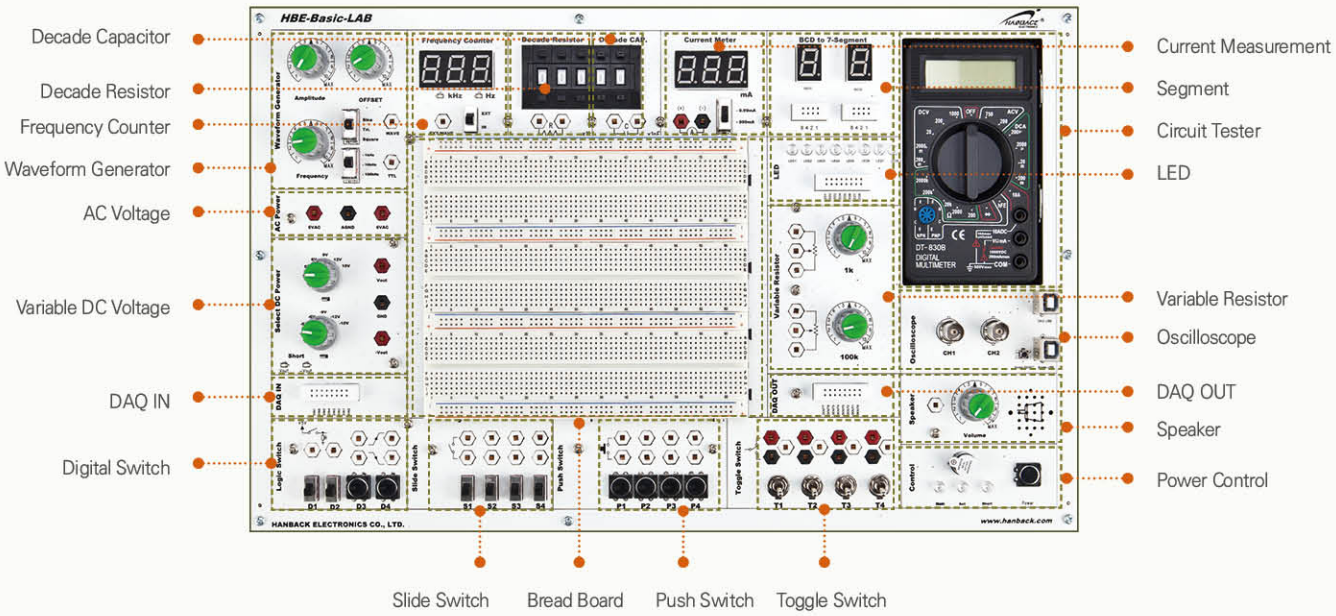
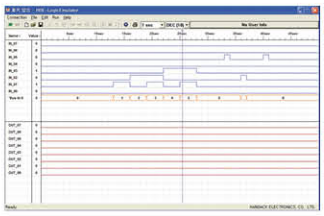


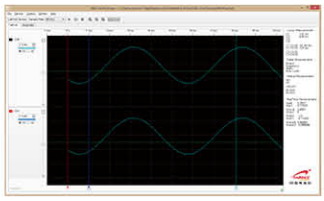
HBE-Basic LAB is a device for those who are new to the basic experiments of electrical/electronics in the analog/digital field. Using the characteristics of electric/electronic devices, DC and AC circuits can be directly constructed and analyzed using built-in instruments.

- It is composed of various input/output devices that enable experiments for analog and digital circuits.
- 2 channels of oscilloscope and PC program are provided. (1ch up to 60Msps).
- Provides Waveform Generator which outputs Sine, Triangle, Square Wave of basic 100KHz/10V(Vp-p).
- Provides DAQ device that generates and monitors 8 bit input/output signals.
- Provides Bread Board consisting of 3 terminal strips and 4 bus strips as standard.
- Able to configure a breadboard circuit with AC Power, Variable DC Power, Variable Resistor/Capacitor and Analog/Digital Switches to use output devices such as Speaker, FND, and LED.
- A power cut-off circuit is provided to protect the equipment from short-circuit when a separate circuit is configured.

Measuring S/W for PC



DAQ



Oscilloscope

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Training Contents

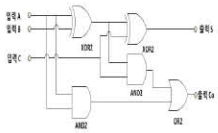
Basic LAB	Digital Circuits and Signals	Basic Logic Gates
	Digital Signals and Information Representation	Combination Logic Circuit
	Generation of Digital Signals	Sequence Logic Circuit
		Memory
		Digital Logic Circuit Application

Hardware Specification

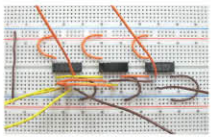
Item		Specification
Input Parts	AC Power	6VAC, 0VAC, 6VAC
	Variable DC Power1	+3V, +5V, +6V, +9V, +12V, +15V SELECT
	Variable DC Power2	−3V, −5V, −6V, −9V, −12V, −15V SELECT
	Slide Switch	+5V / 0V Switch 2EA Connector Switch 4EA
	Button Switch	+5V / 0V Switch 2EA, Active High/Active Low Connector Switch 4EA
	Toggle Switch	Connector Switch 4EA 1−2 / 2−3 Select
	Function Generator	Waveform : Sine / Triangle / Square DC Offset : −5V ~ + 5V Amplitude : 0V ~ 10Vp−p Frequency : 0 ~ 1kHz, 1kHz ~ 10kHz, 10kHz ~ 100kHz
	Variable Resistor	1kΩ 1EA, 100kΩ 1EA
	Decade Resistor	3 digit Thumwheel Switch 0~999kΩ Select
	Decade Capacitor	2 digit Thumwheel Switch 0~99nF Select
Output Parts	LED display	5pi RED LED 8EA
	7−Segment Display	Anode Common BCD 7−Segment 1EA Cathode Common BCD 7−Segment 1EA
	Speaker	4Ω Speaker with Volume Control
Measurement Parts	Oscilloscope	Using PC Software (USB Cable connected) Sampling Speed : 20kHz ~ 60MHz / 1ch 14 step / 2ch 11 step 1ch up to 60Msps(2ch up to 30Msps) Voltage Range : +25V ~ −25V Voltage Division : 0.02V ~ 5V / 8 step Impedance : 1MΩ Capacitance : TBD pF View : AC / DC Control Measure : Frequency, Vmax, Vmin, Vp−p, Vmean Cursor Measurements
	Multi−Tester	Power supply in board Voltage/Current/Resistor/Diode/Transistor Measure
	Measurement Block	3 digit 7−Segment display Ampere measure : 0 ~ 999mA / 0~9.99mA Select Frequency measure : 0Hz ~ 100kHz In / Ext Select
	DAQ	Using PC Software (USB Cable connected) Sampling Speed : 1ms, 10ms, 100ms 1s Input : 8 bit digital Data Output : 8 bit TTL Level
Experiment Part	BreadBoard	Terminal Strip 6EA, Bus Strip 4EA
Over Current Check Block	Power Protection Circuit	Allowable Current: +15V 500mA / +5V 500mA / −5V 500mA / −15V 500mA VPWR Positive 500mA / VPWR Negative 500mA Turn off the power when the circuit exceeds the allowable current for reasons such as short circuit When the power is turned off, a warning sound is generated through the buzzer. Indicates power connection / operation / short status through LED Power can be supplied/disconnected using a switch

Experiment Example

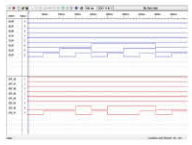
Digital Circuit Experiment Example



❶ Preparing

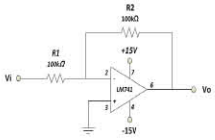


❷ Wiring

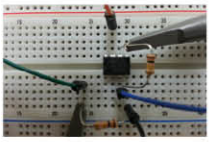


❸ Measuring Result

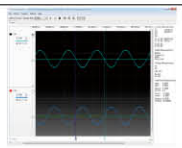
Analog Circuit Experiment Example



❶ Preparing



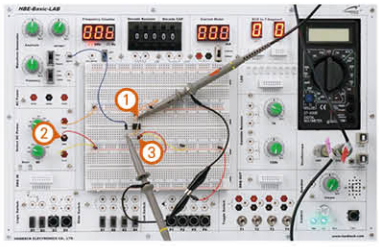
❷ Wiring

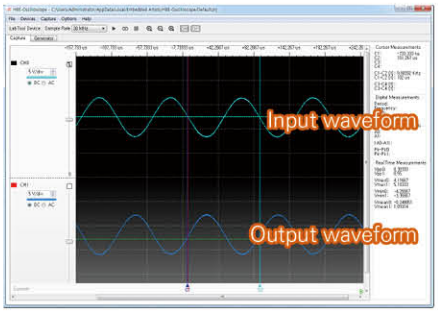


❸ Measuring Result

Application Example

Inverting Amplifier Experiment

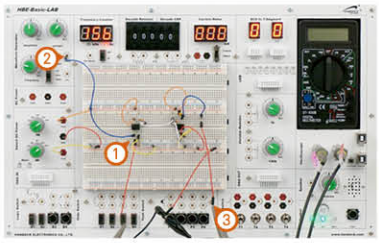


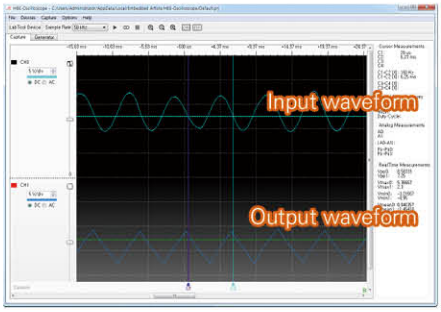


❶ Design the circuit on Bread Module.
❷ Set the power to supply to circuit in Variable DC Power and connect to circuit.
❸ Measure the output using the oscilloscope of equipment.

Result Waveform

Waveform Converter Experiment





❶ Design the circuit on Bread Module.
❷ Set the input frequency using Function Generator.
❸ Measure the output using the oscilloscope of equipment.

Result Waveform

Components

Basic LAB

AC Power cable

Platform USB
(include Example) 1EA

USB cable (A to B Type)

Oscilloscope Probe

User Guide book 1EA