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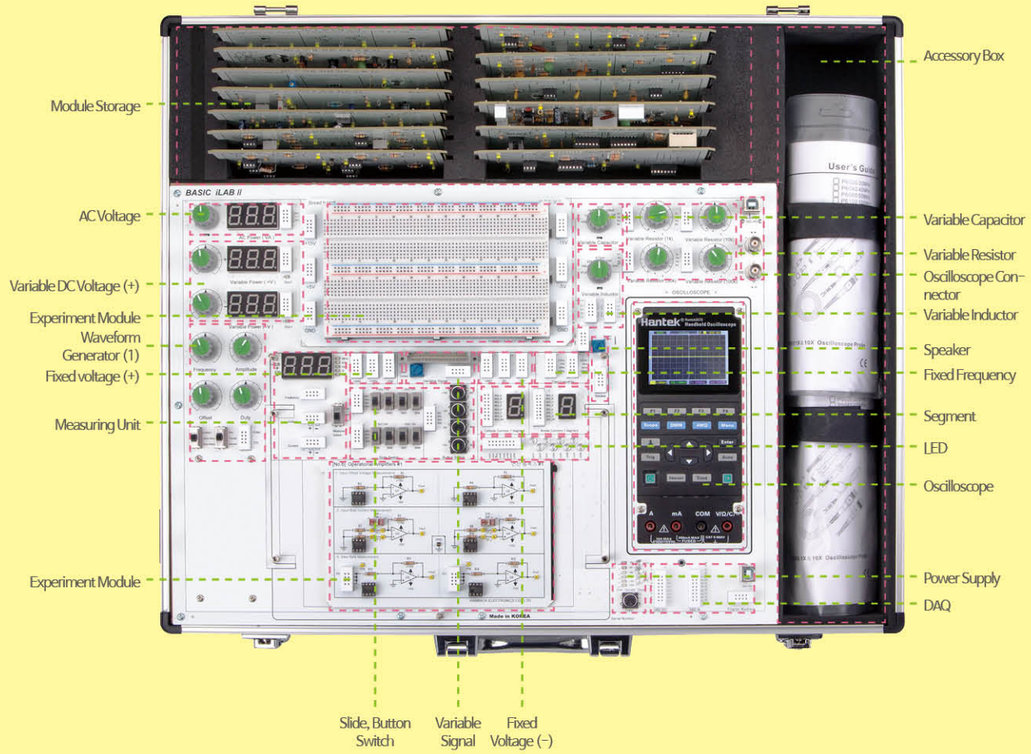
Homepage

Basic-iLab II

Basic Electrical and Electronic Communications Training Equipment

HANBACK ELECTRONICS Since 1984

Basic-iLab II



Product Overview

Basic-iLab-II is in line with the changing education paradigm as the recent shift to a technological hybrid knowledge economy. It is an integrated device with a built-in basic instrument that allows you to practice basic electrical, electronic, communication, and digital logic circuits in one unit by modularizing based on proven circuits.

Electric and Electronic and Communication Experiment

It consists of measuring equipment such as oscilloscope, waveform generator, multimeter, and various input / output devices that can be used for experiments of analog and digital circuits.

Basic experiments can be done intuitively by constructing basic electric and electronic circuits into modules for practical exercises.

It is configured to use digital logic circuit, analog communication and digital communication module in parallel.

By using AC power, Variable DC Power, Fixed Power, Variable Resistor and Analog and Digital Switch, the circuit of bread board can be configured to use Speaker, FND, LED, etc.

2 channels of oscilloscopes are provided (2ch up to 250Msps)

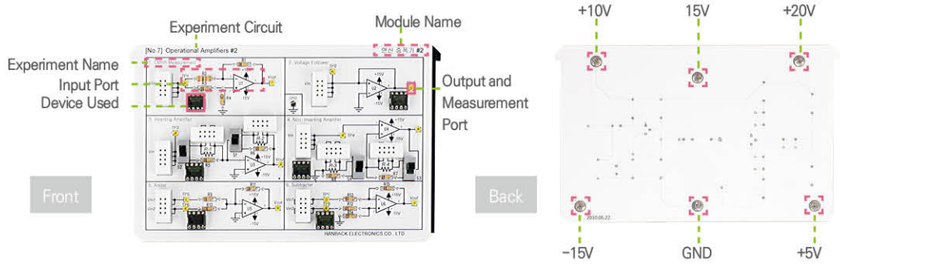
Waveform Generator which can output Sine, Triangle and Square wave of basic 100KHz/10V(Vp-p) is provided

Breadboard consisting of 3 terminal strips and 4 bus strips is available as an option.

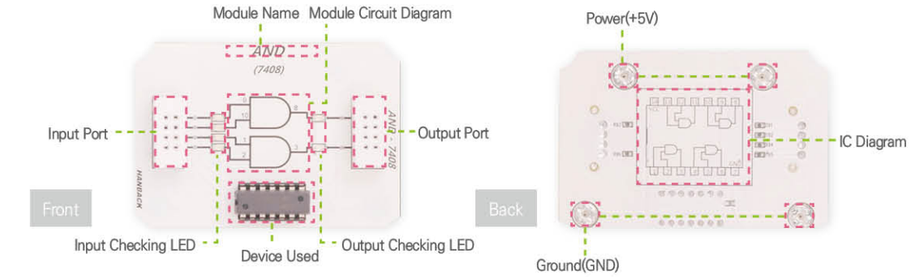
In case of separate circuit setting, power-cut-circuit is configured for short circuit and equipment protection.

8-bit output signal for easy use of digital logic circuit module and DAQ device for monitoring signal are provided.

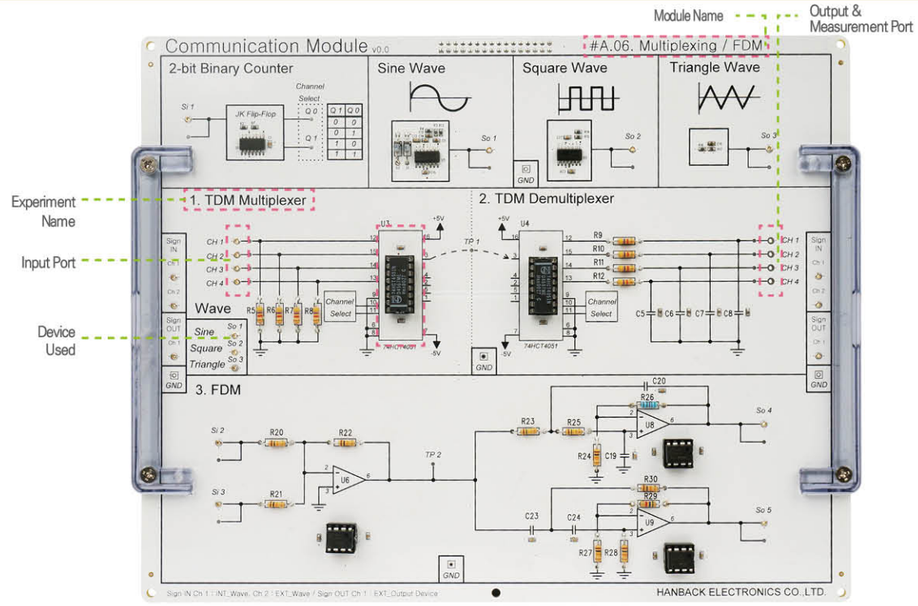
Electrical • Electronic Circuit Module (Option)



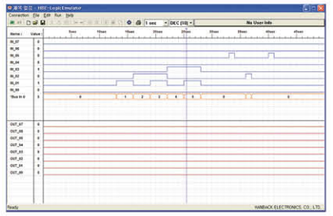
Logic Module (Option)

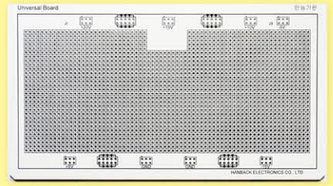


Communication Module (Option)

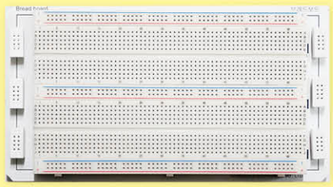


Measurement SW for PC DAQ





Universal Board (Option)



Bread Board (Option)

Hardware Specifications

Input Parts

Item	Specifications
AC Power	0VAC, 3VAC, 6VAC, 9VAC, 12VAC 3digit 7-Segment Display (Selected AC Power)
Variable DC Power1	+1.5V ~ +18.5V 3digit 7-Segment Display (Output DC Power)
Variable DC Power2	-1.5V ~ -18.5V 3digit 7-Segment Display (Output DC Power)
Analog Signal	+5V ~ -5V
Fixed Power(DC)	+20V, +15V, +5V, GND, -5V, -15V
Slide Switch	+15V / 0V Switch 2EA +5V / 0V Switch 2EA -5V / 0V Switch 2EA -15V / 0V Switch 2EA
Button Switch	+15V / 0V Switch 1EA +5V / 0V Switch 1EA -5V / 0V Switch 1EA -15V / 0V Switch 1EA

Item	Specifications
Waveform Generator	Waveform : Sine / Triangle / Square DC Offset : -5V ~ + 5V Amplitude : 0V ~ 10Vp-p Frequency : 0 ~ 1kHz, 1kHz ~ 10kHz, 10kHz ~ 100kHz Duty Rate : 10~90%(Square) Output Level : +5V TTL Level
Fixed Frequency	Output Level : +5V TTL Level Frequency : 0.5Hz, 1Hz, 50Hz, 100Hz, 500Hz, 1kHz, 5kHz, 10kHz
Variable Resistor	1kΩ 1EA, 5kΩ 1EA, 10kΩ 1EA, 50kΩ 1EA
Select Capacitor	100pF, 1nF, 10nF, 47nF, 100nF, 1uF Capacitor Select
Select Inductor	47uH, 100uH, 220uH, 470uH, 1mH, 2.2mH Inductor Select

Output Parts

Item	Specifications
LED display	5pi RED LED 8EA
7-Segment Display	Anode Common 7-Segment 1EA Cathode Common 7-Segment 1EA
Speaker	4Ω Speaker with Volume Control

Measurement Parts

Item	Specifications
Oscilloscope	Display : 2.8inch 64K Color TFT LCD, 320x240 Pixels Resolution Sampling Speed : 250MHz(single ch), 125MHZ(dual ch) Band Width : 70MHz Measurement Range : -30V ~ +30V Voltage Division : 10mV ~ 10V Record Length : Max 6K samples for single-channel 3K samples per dual-channel SEC/DIV Range : 5ns/div ~ 500s/ div 1, 2, 5 sequence DC Gain Accuracy : +-3% for Normal or Average acquisition mode 10V/div to 10Mv/div

Item	Specifications
Multi-Tester	Maximum Resolution : 4000 Counts AC/DC Voltage : up to 600V AC/DC Current : up to 10A Resistance : up to 40MΩ Capacitance : up to 100Uf Diode : 0~1V Testing Modes : Voltage, Current, Resistance, Diode, Capacitance
Measurement Block	Display : 3 digit 7-Segment display Measure Select : Voltage / Ampere / Frequency Voltage measure : 0 ~ 30V Ampere measure : 0 ~ 9.99A Frequency measure : 0Hz ~ 5MHz Display unit using LED
DAQ	Using PC Software (USB Cable connected) Sampling Speed : 1ms, 10ms, 100ms 1s Input : 8 bit digital Data Output : 8 bit TTL Level Waveform Genetator : A/D Convertor with 8 bit output data

Theme Module Block

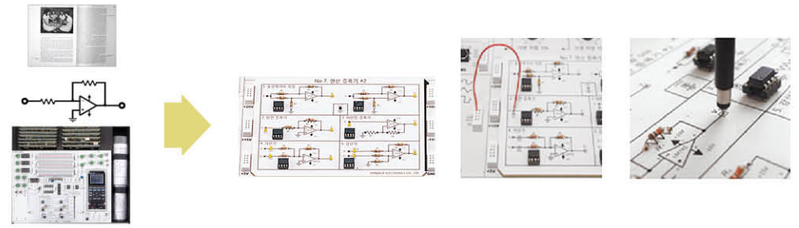
Item	Specifications
Electric Electronic Theme Block	Power : +20V, +15V, +10V, +5V, GND, -5V, -15V | Size : 172 mm x 110mm or 200mm x 110mm 2EA
Communication Theme Block	Power : +15V, +5V, GND, -5V, -15V | Size : 250mm x 200mm | 1EA
Digital Logic Theme Block	Power +5V, GND | Size : 70mm x 50mm 4EA | Using Adaptor Module in Electronic Thema Block

Over Current Check Block

Item	Specifications
Power Protection Circuit	Allowable Current : +20V 200mA / +15V 500mA / +10V 300mA / +5V 500mA / -5V 500mA / -15V 500mA If the circuit uses more than the allowable current for short-circuit reasons, shut off the power. When the temperature inside the equipment is over a certain temperature (70 ℃), the power is cut off. Beep sound when power off LED indicates the location of the power source that is problematic when the power is off LED informs the status of power connection / operation / short Power can be switched on / off using a switch

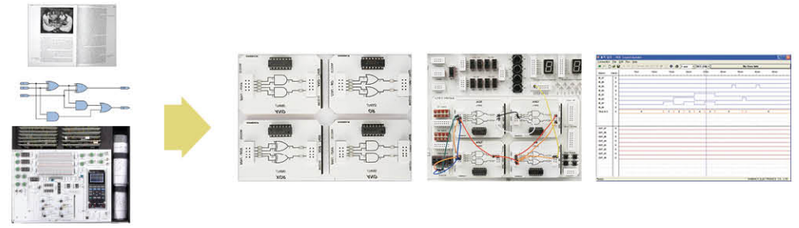
Practical Exercise

Electronic· Electric Module Exercise



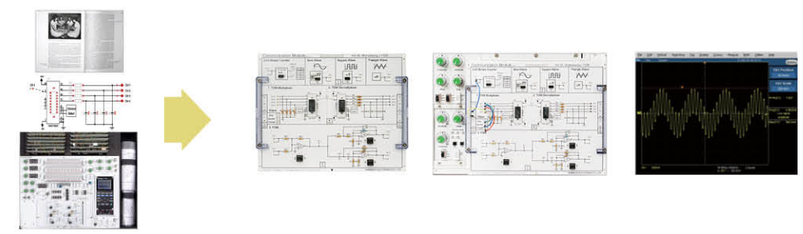
1 Prepare for experiment 2 Select the experiment module 3 Wire connection 4 Power on and test the result

Logic Module Exercise



1 Prepare for experiment 2 Select the experiment module 3 Wire connection 4 Power on and test the result

Communication Module Exercise



1 Prepare for experiment 2 Select the experiment module 3 Wire connection 4 Power on and test the result

Curriculum

Basic Electric Parts (Optional)

Experiment Module	Experiment Theme
No.1 Ohm's Law	Series, parallel, series-parallel circuit of resistance
	Ohm's law
No2. Kirchhoff's Law	Kirchhoff's Law of Voltage
	Kirchhoff's Law of Current
No3. Law of Distri-bution	Law of Voltage Distribution
	Law of Voltage Distribution
No4. Maximum Power Delivery	Maximum Power Delivery Conditions
No5. Thevenin and Norton's Theorem	Thevenin's Theorem
	Norton's Theorem
No6. Loop, Node Method	Understanding loop and node equations with independent voltage and current sources
No7. RC Series, Parallel Circuit	Understanding Current-Voltage Characteristics of RC Series Circuits
	Understanding Current-Voltage Characteristics of RC Parallel Circuits
No8. RL Series, Parallel Circuit	Understanding current-voltage characteristics of RL Series Circuits
	Understanding current-voltage characteristics of RL Parallel Circuits

Experiment Module	Experiment Theme
No9. RLC Series, Paral-lel Circuit	Understanding RLC Series and Parallel Circuits in AC
	Understanding the resonance characteristics of RLC series and parallel circuits
No10. Diode	Understanding how diodes work
	Understand voltage-current characteristics of diodes
	Understanding the Voltage-Current Characteristics of Zener Diodes
No11. Clipper, Clamper	Understand the operation of series and parallel clippers and biased clippers
	Understanding clamper circuits according to diode direction
No12. Rectifier Circuit	Understanding of Half-wave, Full-wave, Bridge Full-wave Rectifier
No13. Filter	Understanding circuits of Low Pass and High Pass Filters
	Understanding circuits of Band Pass and Band Stop Filters

Basic Electronic Part (Optional)

Experiment Module	Experiment Theme
No1. Semiconductor Devices	Audio Amplifier
	Common Source J-FET Amplifier
	Input Offset Voltage Measurement
	Input Bias Current Measurement
	SR (Slew Rate) Measurement
	Common Mode Rejection Ratio(CMRR) Measurement
No2. DC Power Circuit #1	voltage follower
	Inverting Amplifier, Non-Inverting Amplifier
	Adder, Subtracter
	Integrator, Differentiator
	Low Pass Filter
	High Pass Filter
No3. DC Power Circuit #2	Band Pass Filter
	Comparator
No4. Amplifier Circuit #1	L-C Oscillation Circuit
	R-C Oscillation Circuit
NO5. Amplifier Circuit #2	Audio Amplifier
	Common Source J-FET Amplifier
No6. Operational Amplifier #1	Input Offset Voltage Measurement
	Input Bias Current Measurement
	SR (Slew Rate) Measurement
No7. Operational Amplifier #2	Common Mode Rejection Ratio(CMRR) Measurement
	voltage follower
	Inverting Amplifier, Non-Inverting Amplifier
	Adder, Subtracter

Experiment Module	Experiment Theme
No8. Operational Amplifier #3	Integrator, Differentiator
	Low Pass Filter
	High Pass Filter
	Band Pass Filter
	Comparator
No9. Oscillation Circuit	L-C Oscillation Circuit
	R-C Oscillation Circuit
	Sine wave generator
	Square wave generator
	Tri-angle wave generator
No 10. Pulse Circuit	Non-stable multi-vibrator
	Monostable Multi-vibrators
	Clipper, Clamper
	RLC Response Waveform Characteristic
No11. Mod./Demod. Circuit	Amplitude Modulation/Demodulation
	Frequency Modulation/Demodulation
No12. Interface/DA converter circuit	TTL / C-MOS Interface
	Scaling Circuit using Opto-electric interface
	DA conversion experiment
No13. AD converter circuit	AD conversion experiment

Logic Part (Optional)

Experiment Module	Experiment Theme
Boolean Algebra	AND, OR, NOT Calculation
	NAND, NOR, XOR, XNOR Calculation
	Boolean algebra theorem
	Simplification of logical expressions
Combination Logic Circuit	Half-adder
	2bit Subtracter
	Adder & Subtracter
	Encoder & Decoder

Experiment Module	Experiment Theme
Combination Logic Circuit	1x4 De-Multiplexer
	Comparator
Sequential Logic Circuit	RS FLIP-FLOP
	Divider Circuit
	Binary Coded Decimal
	Electronic Dice
	Decade Ring Counter
	Decade Counter

Communication Part (Optional)

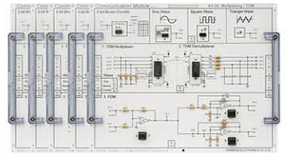
Experiment Module	Experiment Theme
Oscillators	Colpitts Oscillator
	Hartley Oscillator
	Wien-Bridge Oscillator
	Parallel RC Oscillator
	Crystal Oscillator
	Voltage Controlled Oscillator
Filter	Low-pass filter
	High-pass filter
	Band-pass filter
	Band-stop filter
AM Mod/Demod	AM Modulator
	AM Demodulator (Diode Detector)
	AM Demodulator (Product Detector)
DSB-SC/SSB Mod/Demod	DSB-SC Modulator
	SSB Modulator
	DSB-SC Product Detector
	SSB Product Detector
FM Mod/Demod	FM Modulator(LM566 characteristic experiment)
	FM Modulator(Frequency modulation using LM566)
	FM Modulator(PLL characteristic experiment using LM565)
	FM Demodulator(LM565 V-F characteristic experiment)
	FM Demodulator(PLL Frequency Demod. exper-iment)

Experiment Module	Experiment Theme
Multiplexing	Time Division Multiplexing/Demultiplexing
	Frequency Division Multiplexing/Demultiplexing
AD/DA Converter	A/D Converter
	D/A Converter
PCM/Delta	PCM Modulator
	PCM Demodulator
	Delta Modulator
	Delta Demodulator
PWM Communication	PWM Modulator
	PWM Demodulator
ASK Mod/Demod	ASK Modulator
	ASK Demodulator
PSK Mod/Demod	PSK Modulator
	PSK Demodulator
FSK Mod/Demod	FSK Modulator
	FSK Demodulator
Line Code	Bipolar NRZ Signal Encoder/Decoder
	RZ Signal Encoder/Decoder
	Manchester Encoder/Decoder
	AMI Encoder/Decoder
PLL	PLL Frequency Synthesizer

Product Configuration

Basic-iLab-II
(Choice of Electrical / Electronic / Communication / Logic Module)

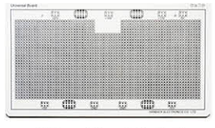
User Manual and Platform USB
1EA



Communication Module

Oscilloscope Probe

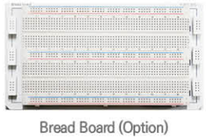
USB Cable



Universal Board (Option)

AC Power Cable

Logic Module (Option)



Bread Board (Option)

Basic Electrical and Electronic Communications Training Equipment

Basic-iLab II

- Built-in basic measuring equipment
- Available to study a electric, electronic, communications and digital logic circuit themes with one platform
- Providing simulation-proven training circuits
- Training skills for troubleshooting
- Shutdown circuit configuration for equipment protection
- Module set based on verified circuit
- Application experiments available through built-in bread board and universal board
- 2.8 inch Color LCD
- Built-in high performance oscilloscope

HANBACK ELECTRONICS
Since 1984

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