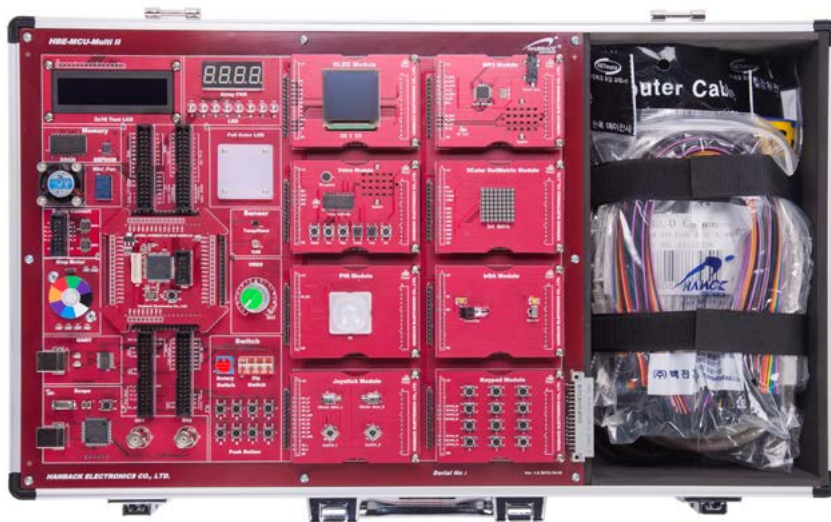


Microprocessor

Creative Engineering Design Platform Based on Multi-MCU

HBE-MCU-Multi II



- Supports various MCUs with independent module structure
- Modularization of applications by function
- Provides Oscilloscope to learn MCU efficiently
- Provides various interfaces for signal connection between MCUs and modules
- Provides various example program sources for basic practice and project practice
- Provides Graphic Language Tool for C Language Education for MCU applications

Equipment Overview

8-bit-based MCU product is a basic processor that has been used for educational purpose for a long time. As for the equipment manufactured for the old training method, it was impossible to configure with the functions desired by the user.

It is a micro-embedded education system that supports various MCUs and modularizes each function to quickly apply various project classes and user requirements as well as basic education in order to effectively apply the creative engineering education, which has recently been popular in university and high school.

Furthermore, educational environment for 32-bit MCUs that have recently become the subject of interest is provided.

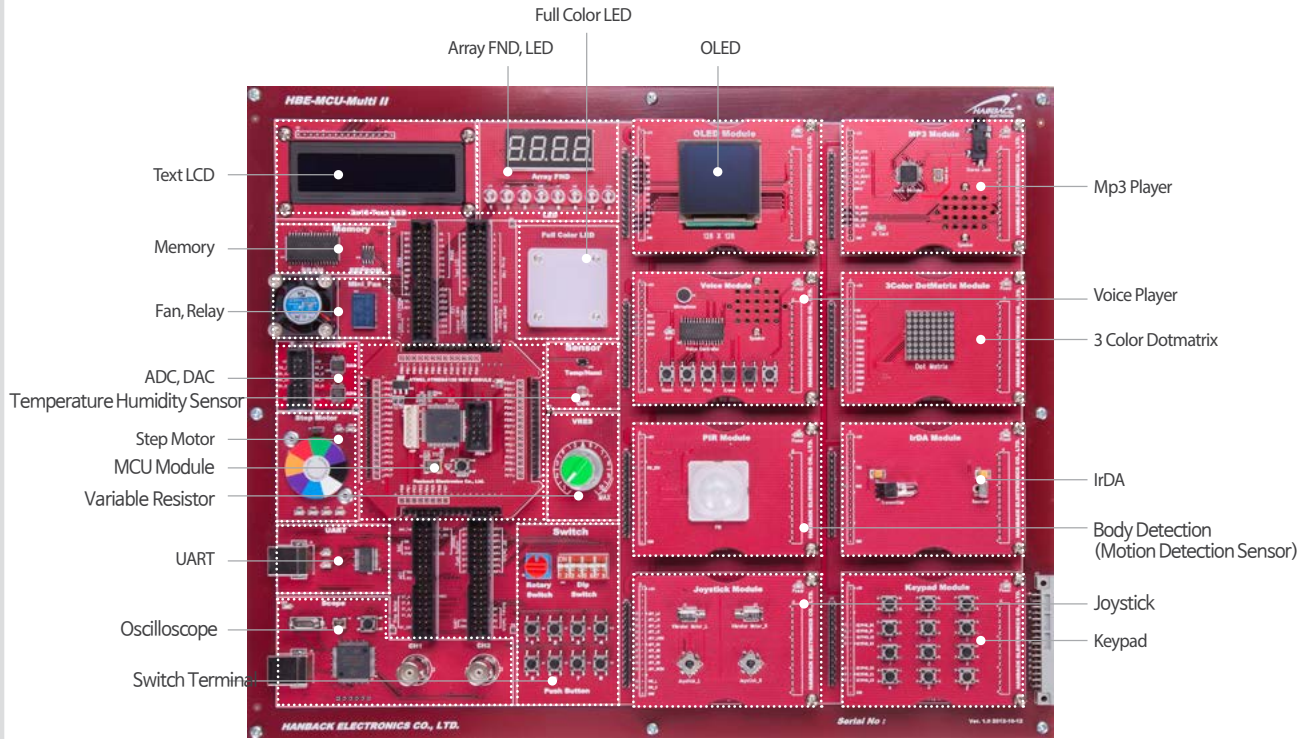
Features of Equipment

- ATmega128, 89S51, PIC18F6722, Cortex-M3, and M4 devices are each designed as module with a detachable connector to make it possible to learn various Microcontrollers.
- Provides a structure that can connect various MCU modules and function modules.
- Each functional module is configured in the form of a detachable module to allow the user to design the application. Users can design the application in the desired form.
- Provides a graphic language tool with real-time C language conversion function for C language education through MCU learning and MCU application.
- Provides a two-channel oscilloscope and dedicated measurement points to analyze signals from MCUs and applications.
- It is possible to install various sensor modules.
- Provides application modules to train USN and sensors.
- Provides various example program sources needed for application practice.
- Supports various design environments from basic level processor training up to application design training level.
- Provides various optional modules such as Stack module and Activator module to maximize its application

HBE-MCU-Multi II

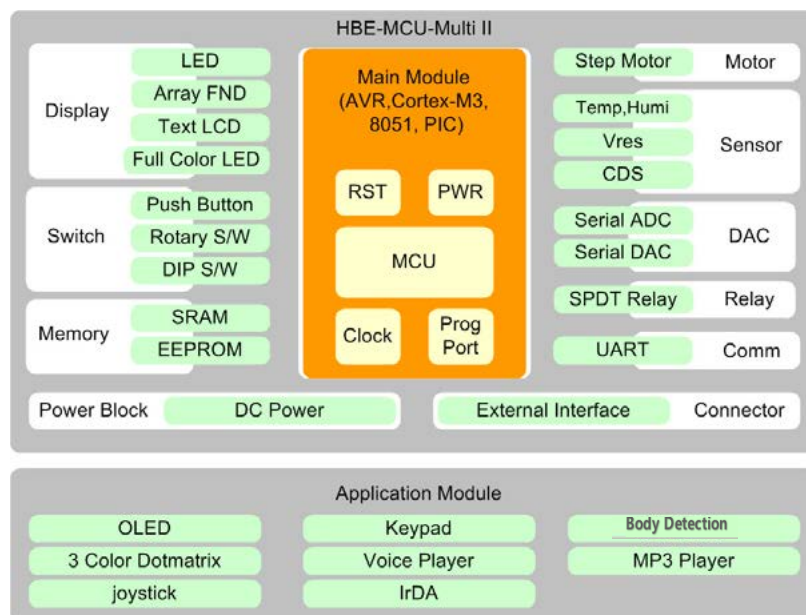
Configuration and Name

HBE-MCU-Multi II is configured to improve the basic understanding of MCU, and to systematically understand the principles of signals and how registers are handled in C language through direct wiring. Graphical language tools helps to understand C language more easily while motivating it.



HBE-MCU-Multi II

Block Diagram



MCU

Items	Manufacture	Model	Compiler	Specification
AVR	ATMEL	ATmega 128A	AVR Studio WinAVR HBE-VPEX-C™ HBE-AVR-ISP MK II™	Up to 16 MIPS Throughput at 16MHz JTAG Interface, ISP Program 128KB FLASH, 4KB SRAM, 4KB EEPROM 8-Ch PWM, 8-Ch 10-bit ADC I ² C, SPI, 2EA 8-bit Timer, 2EA 16-bit Timer Dual UART
PIC (Option)	MICROCHIP	PIC18F6722	MPLAB IAR EWPIC Pickit 3	Up to 5MIPS Throughput at 20MHz ISP Program, 7.2KB FLASH, 192B SRAM, 128B EEPROM 2-Ch PWM, 8-Ch 10-bit ADC I ² C, SPI, UART
8051 (Option)	ATMEL	AT89S 51	IAR EW8051 HBE-8051-ISP™	Up to 33MHz Operating ISP Program 4KB FLASH, 128B SRAM 2EA 16-bit Timer, UART
Cortex-M3 (Option)	ST	ST32F103	IAR EWARM	Up to 72MHz Operating JTAG Program 128KB FLASH, 20KB SRAM 6-Ch PWM, 3UART, 2SPI, 2 I ² C, CAN USB2.0, 16-Ch 12-bit ADC
Cortex-M4 (Option)	ST	ST32F303	IAR EWARM	Up to 144MHz Operating JTAG Program 1MB FLASH, 4KB SRAM Ethernet Camera, 12-bit ADC Excluding examples for option module

On-Board Device

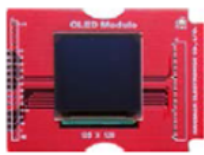

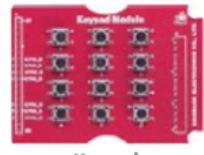


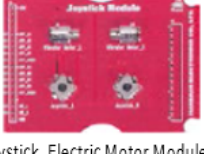

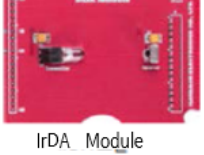
Classification	Items	Specifications
Display Element	Text LCD 16X2 line	English letter, number, Special letter, 16x2 lines, 1EA
	LED	Status display element using LED ON/OFF, Red, 8EA
	Array FND	4-digit number display, 1EA
	Full Color LED	3 Color(RGB) in 1 device, Diffusion Plate included
Input Element	Push Button	6mmx6mm, 8EA
	Dip Switch	8 Port, 1EA
	Rotary Switch	4-bit BCD code, Spin interface, 1EA
Motor	Step Motor	12 VDC, 7.5degree/step, 10Mn/m, Hall sensor included, 1EA
Communication	UART	UART 1EA
Memory	EEPROM	2MB, I ² C Interface
	SRAM	128KB, 8-bit data
Sensor	Vres	Variable Resistance 1EA
	Cds	Photozell for light detection, 1EA
	SHT21	Temperature Humidity Sensor, I ² C Interface
DAC	DAC	4 Ch D/A Converter, SPI Interface
ADC	ADC	4 Ch A/D Converter, I ² C Interface
Scope	Oscilloscope	2Ch Oscilloscope built-in, Signal can be observed or analyzed using PC

Module Device

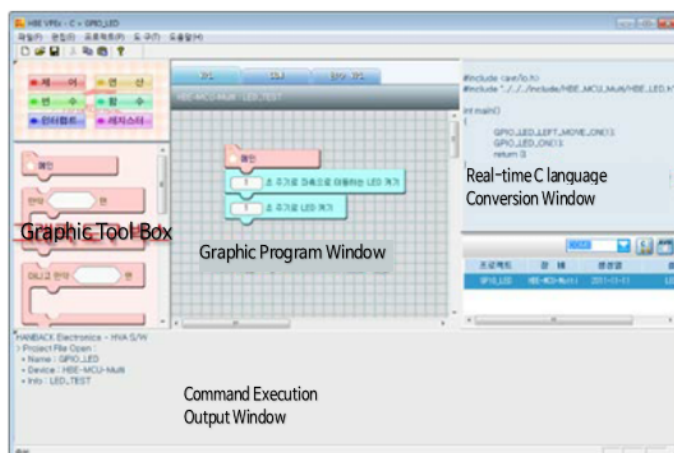
Classification	Items	Specifications
Display Element	OLED	128X128 pixel
	3color Dotmatrix	8x8 pixel
Input Element	Keypad	Configured with button, Push button 12EA
	Joystick, Electric Motor	Joystick 2EA, Electric Motor 2EA
Communication	IrDA	For infrared communication, Transmitter 1EA, Receiver 1EA
Media	Voice Player	4-bit BCD code, Spin interface, 1EA
	MP3, SD	12 VDC, 7.5degree/step, 10Mn/m, Hall sensor included, 1EA
Sensor	Movement Detection	Distance to detect: below 4m

HBE-MCU-Multi II

Functions by Module

Items	Function	Items	Function
 OLED	Module that can display true colors using OLED panel consisting of 128 x 128 pixels and can be used as a digital picture frame and other indicator	 Voice Player	Module that can save or play back audio, which is used in applications such as voice storage and playback
 Keypad	3 x 4 button is implemented and serve as input device in various applications	 MP3, SD Interface Module	Module and SD card interface to store file, which enables to create an MP3 player
 Body Detection	Can be used as a motion detector using infrared rays and also can be used for security or light control	 Joystick, Electric Motor Module	Module combines a vibrator with a joystick used as a robot control or input device, which can be used for realistic control application
 3 Color dotmatrix	Dot matrix module expressing 3 colors, which is used as various display devices	 IrDA Module	Infrared communication module, on which various remote control appliances can be controlled using remote control signals, and infrared communication can also be implemented

Software



HBE-VPEX-C™

HBE-VPEX-C is a type of Visual Programming Language (VPL), which is a graphic language tool that is configured to perform programs using graphic, perform compilation with one button, and even download.

In addition, by providing real-time C language conversion function, it is configured to make it easier to understand the process of controlling the MCU by C language, which is considered to be difficult.

Training Contents

Course	Training Contents
Learning Microcontroller (AVR) with HBE-MCU-Multi II	- AVR Microcontroller
	- AVR Microcontroller Development- Outside Memory Interface Environment
	- GPIO Input Output Control
	- Internal Memory Understanding
	- Timer using TC
	- PWM using TC
	- Receive External Input using TC
	- UART Communication
	- Serial Interface
	- A/D Converter, D/A Converter
	- Rotate Step Motor
	- Password Input Device using Keypad
	- Create Voice Recorder and MP3 Player
	- Create Digital Frame using OLED

Configuration



HBE-MCU-Multi II
Body



Manual with
USB



HBE-AVR-ISP
Programmer



USB Cable
(A to B Type)



AC Power Cable



Jumper Cable
(8Pin*5EA, 4Pin*10EA, 2Pin*10EA)