Creative Engineering DesignPlatform Based onMulti-MCU

MCU Multi II

HANBACK ELECTRONICS CO.,LTD.

Since **1984**

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Homepage

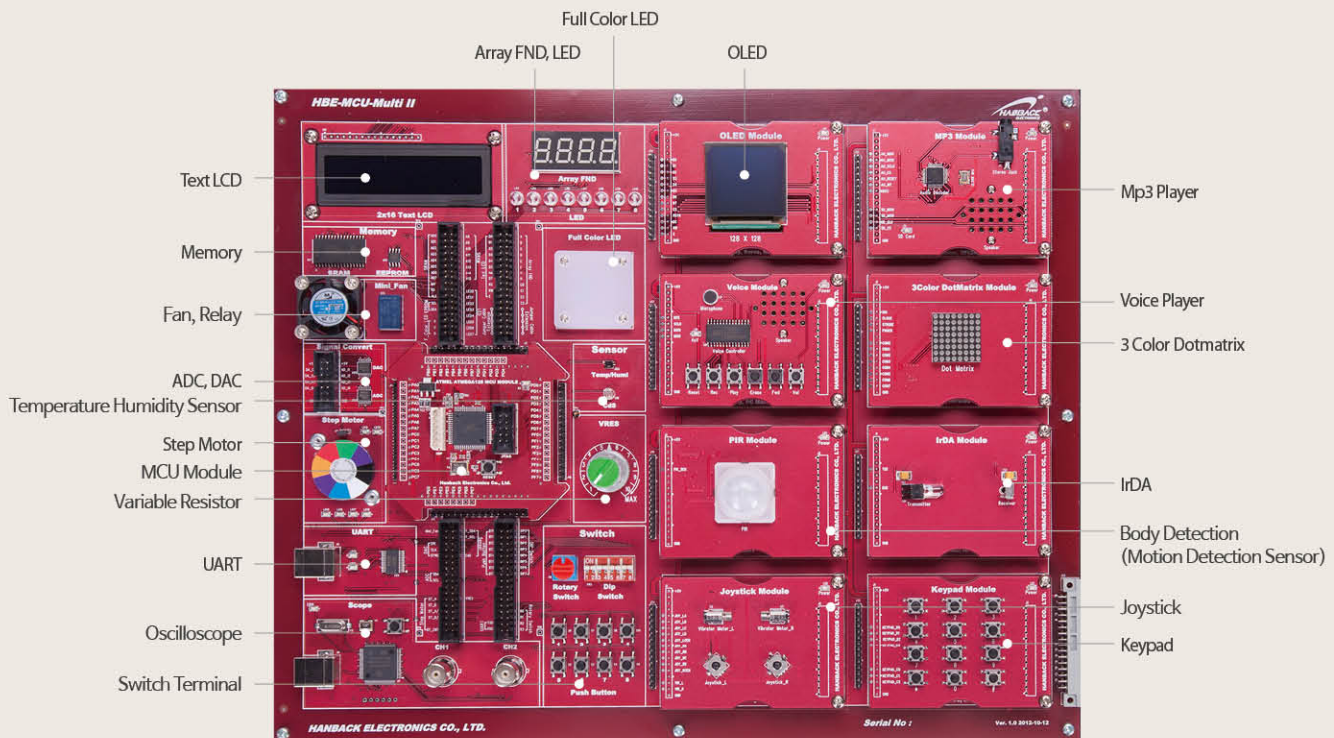# Creative EngineeringDesignPlatform BasedonMulti-MCU MCU Multi II

HBE-MCU-Multi II circuit is configured for the basic understanding of MCU

It's designed to help understand the principles of signals and how registers are handled in language C.

Graphical language tool helps to motivate for C language and make it easier to understand C language

Labels around the board:
- Full Color LED
- Array FND, LED
- OLED
- Text LCD
- Memory
- Fan, Relay
- ADC, DAC
- Temperature Humidity Sensor
- Step Motor
- MCU Module
- Variable Resistor
- UART
- Oscilloscope
- Switch Terminal
- Mp3 Player
- Voice Player
- 3 Color Dotmatrix
- IrDA
- Body Detection (Motion Detection Sensor)
- Joystick
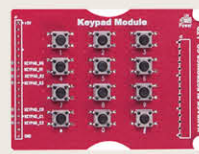- Keypad

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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
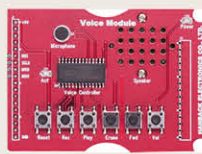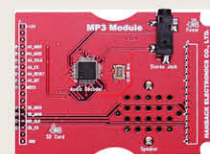
Voice Player
Module that can save or play back audio, which is used in applications such as voice storage and playback

Keypad
3x4 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
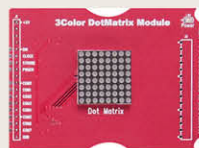
Body Detection
Can be used as a motion detector using infrared rays and also can be used for security or light control

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

Items	Manufacture	Model	Compiler	Specifications
AVR	ATMEL	ATmega 128A	Microchip Studio WinAVR HBE-AVR-ISP	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 I²C, 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 I²C, 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 I²C, 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 Specification

Classification	Items	Specifications
Display Element	Text LCD 16 X 2 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	6mm x 6mm, 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, I²C Interface
	SRAM	128KB, 8-bit data
Sensor	Vres	Variable Resistance 1EA
	CdS	Photocell for light detection, 1EA
	SHT21	Temperature Humidity Sensor, I²C Interface
DAC	DAC	4 Ch D/A Convertor, SPI Interface
ADC	ADC	4 Ch A/D Convertor, I²C Interface
Scope	Oscilloscope	2Ch Oscilloscope built-in, Signal can be observed or analyzed using PC

Module Device Specification

| Classification	Items	Specifications
Display Element	OLED	128 X 128 pixel
	3color Dotmatrix	8 X 8 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	Decodes MPEG 1.0 & 2.0 audio layer III decoder, saves Mp3 files to SD card
Sensor	Body Detection	Distance to detect: below 4m

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.

◆ 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.
◆ Provides various input switches and output display devices.
◆ 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

Block Diagram
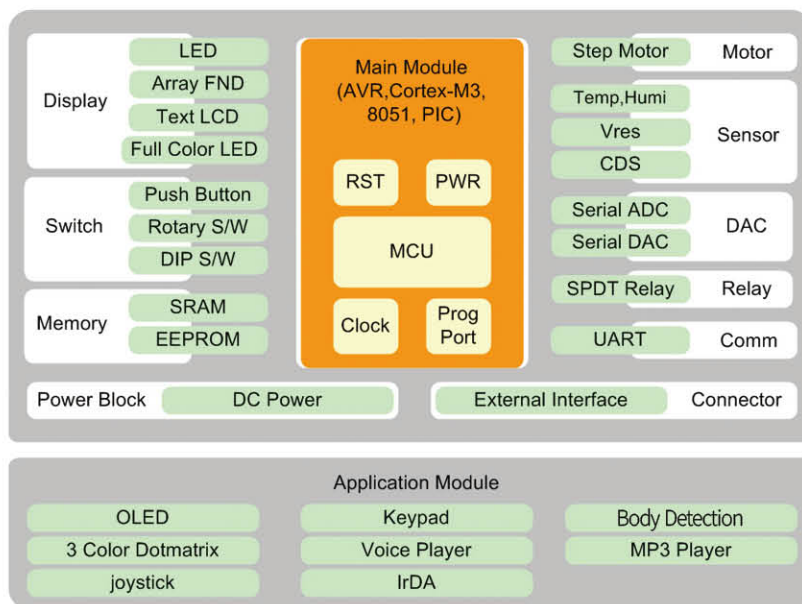
Training Contents

- AVR Microcontroller
- AVR Microcontroller Development Environment
- GPIO Input Output Control
- Internal Memory Understanding
- Timer using TC
- PWM using TC
- Receive External Input using TC
- UART Communication
- Outside Memory Interface
- 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
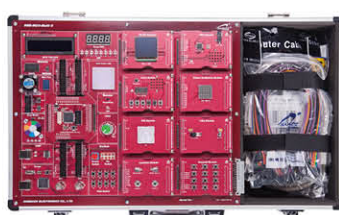
MCU Multi II

AC Power Cable

HBE-AVR-ISP Programmer

USB Cable
(A to B Type)

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

Platform USB
(include OS image and Tools) 1EA

User Guide book
1EA