

# Multi-Controller Trainer kit

## Overview

Multi-Controller kit is a benchtop kit that tends to familiarize the trainee with different Microcontrollers ,related components and connections. The kit is designed in the form of a lightweight portable Plastic case equipped with a real microcontrollers and various electronic components related to its functions to allow wide ranges of experiments. Kit is based on Multi-Controllers Topology with a big advantages of no requirement for hand made jumper wires connections between system components to establish the experiment. The Multi-Controller kit is based totally on the concept of plug-in, all microcontrollers modules , peripheral modules are pluggable which minimize the experiment time and provide safety to the system modules. Kit provides a large number of interface modules with configuration switches which open a wide range of experiments . CPLD module is added to give the gain of knowledge about Configurable digital logic design. With the In-Circuit Debugger/Programmer, just what you need is a USB cable to Laboratory PC, no more additional hardware components to apply programming codes . Easy to use and friendly kit.



## Specifications

- Multi-Controller kit consist of
  - » PIC Microcontroller Plug-in Module : PIC18F45K22
  - » AVR Microcontroller Plug-in Module : ATmega128
  - » 8051 Microcontroller Plug-in Module: AT89S52
  - » CPLD Plug-in Module : Xilinx XCR3256XL (Support for complex asynchronous clocking)
  - » In-Circuit Debugger/Programmer For the supported Microcontroller Modules
- Microcontroller working voltage selectable (+3.3 or +5V)
- Integrated fixed DC power supply module:

+3.3V, +5V, +12V, -5V, -12V (Fuse Protected) with led indicators - accessed via 2mm sockets (for external modules)

- Integrated variable DC power supply Module : +1.25VDC to +5VDC or -1.25VDC to -5VDC (fuse protected) with led indicators - accessed via 2mm sockets (for external modules)
- Pullup and pulldown resistor for every microcontroller Pin (selectable between (pull-up, floating, pull-down)
- Indication LED for every microcontroller Pin
- Push Button for every microcontroller pin (selectable between VCC or GND signal)
- Pin header male/female groups for every microcontroller PORT for external Connections
- Programming IDE:
  - » supports MPLAB® X integrated development environment and MikroC for PIC
  - » supports atmel studio 7 development environment, atmel start online tool and MikroC For AVR
  - » supports keil for 8051
  - » supports ISE WebPACK for CPLD
- Includes ready to run codes for all included trainer components
- 8 Digital switches (+3.3 or +5V) Selectable
- Integrated pulse generator from 2 Hz : 1KHz ( level selectable +3.3V or +5V)
- Dip switches for configuring microcontroller I/O Ports.
- AC power source socket (fuse protected) with ON/OFF switch.

**Main Kit :**

**Code : EM-008.1**

• **Type A Communication Kit (EM-008.1.1)**

- » 1 x (2 x 16 LCD module) contrast adjustable via potentiometer
- » 1 x (64 X 128 GLCD module) contrast adjustable via potentiometer
- » 1 X UART To USB Interface Type-A Plug-in Module
- » 1 x I2C EEPROM type-A plug-in module

- » 1 X RS232 Interface Type-A Plug-in Module

**Type A Actuator Kit (EM-008.1.2)**

- » 1 x Piezo buzzer type-A plug-in module
- » 1 x speaker type-A plug-in module
- » 1 X seven segment type-A plug-in module
- » 1 x stepper motor interface Through ULN23803
- » 1 x DC motor interface
- » 1 x servo motor interface

• **Type A Sensors kit (EM-008.1.3)**

- » 1 x temperature sensor LM35 type-A plugin module
- » 1 x temperature sensor D518B20 type-A plug-in module
- » 2 x potentiometers to Simulate analog I/P To microcontroller (microcontroller connected pin selectable)
- » 5 X Type-A Plug-in Modules Holder ( For Type-A Plug-in Modules )

• **Type-B Plug-in Modules (EM-008.1.4)**

- » 1 X Type-B Plug-in Modules Holder ( For Type-B Plug-in Modules )
- » 1 x USB socket type B (for direct USB connection as a host)

**Additional Kits (not included)**

**Code : EM-008.2**

• **Additional Type A Communication Kit (EM-008.2.1)**

- » **WIFI**
  - Technial Data :
    - » Signal Type : UART
    - » Signal Level :5V or 3.3V
    - » SMD
- » **Audio In & Out**
  - Technial Data :
    - » Signal Type : SPI
    - » Signal Level : 3.3V

» **SD Card**

- Technial Data :
  - » Signal Type : SPI
  - » Signal Level :5V or 3.3V

» **Ethernet**

- Technial Data :
  - » Signal Type : SPI
  - » Signal Level :5V or 3.3V

» **Bluetooth Module**

- Technial Data :
  - » Signal Type : UART
  - » Signal Level :5V

» **RF Transceiver**

- Technial Data :
  - » Signal Type : SPI
  - » Signal Level :5V

» **UART To RS-232**

- Technial Data :
  - » Signal Type : UART
  - » Signal Level :5V or 3.3V Selectable

» **Serial EEPROM**

- Technial Data :
  - » Signal Type : I2C
  - » Signal Level :5V or 3.3V Selectable
  - » Address Configurable

• **Additional Type A Actuators Kit (EM-008.2.2)**

» **Relay**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level :5V or 3.3V

» **LED**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level :5V or 3.3V Selectable
  - » Address Configurable

» **RGB LED**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level :5V or 3.3V Selectable

» **Limit Switch**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level :5V or 3.3V Selectable

» **Push Button**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level :5V or 3.3V Selectable

» **Laser**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level :5V or 3.3V

» **8x8 LED Matrix**

- Technial Data :
  - » Signal Type : SPI
  - » signal level : 5V or 3.3V

**Additional Type A Sensors Kit (EM-008.2.3)**

» **Light Sensor (CDS Photoresistor)**

- Technial Data :
  - » Signal Type : Analog and Digital
  - » Signal Level :5V or 3.3V Selectable

» **Tilt Sensor :**

- Technial Data :
  - » Signal Type : Digital- Signal
  - » Level : 5V or 3.3V Selectable

» **Mercury Sensor (Switch):**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Reed Sensor (Switch)**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Flame Sensor**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Touch sensor**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Opto Sensor**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Knock Sensor**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **TheEMistor**

- Technial Data :
  - » Signal Type : Analog and Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Humidity And Temperature sensor (DHT11)**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level :5V or 3.3V

» **Vibration Sensor**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Water Sensor**

- Technial Data :
  - » Signal Type : Analog and Digital
  - » Signal Level : 5V or 3.3V Selectable

» **DS18B20 Sensor**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **Humidity, barometric pressure and ambient temperature BME280**

- Technial Data :
  - » Signal Type : I2C
  - » Signal Level : 3.3V

» **IR Reflective**

- » Technial Data :
  - » Signal Type : Analog and Digital
  - » Signal Level : 5V or 3.3V Selectable

» **IR Receiver**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V

» **LM35**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V

» **Sound Sensor**

- Technial Data :
  - » Signal Type : Analog and Digital
  - » Signal Level : 5V or 3.3V Selectable

» **GY-87 Sensor**

- » **3-axis Gyroscope + 3-axis acceleration + 3-axis magnetic field + air pressure**

- » » Technial Data :
- » Signal Type : I2C
- » Signal Level : 5V or 3.3V

» **Ultrasonic Sensor**

- Technial Dta :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V Selectable

» **PIR Sensor**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V

• **Additional type-B Plug-in Modules Code : (EM-008.2.4)**

» **Keybad 3 X 4**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V

» **7 Segment**

- Technial Data :
  - » Signal Type : Digital
  - » Signal Level : 5V or 3.3V

## Scope of Delivery

- Multi-Controller Trainer kit (EM - 008)
  - » Main Kit (EM - 008.1)
    - Type A Communication Kit (EM - 008.1.1)
    - Type A Actuator Kit (EM - 008.1.2)
    - Type A Sensors kit (EM - 008.1.3)
    - Type-B Plug-in Modules (EM - 008.1.4)
  - » USB cable A to B 1.5 m
  - » RS232 cable 1.5 m
- Hard copy user manual

## Required of Operation

- Laboratory PC

## Options

- Additional Kits (EM-008.2)
- Additional Type A Communication Kit (EM-008.2.1)
- Additional Type A Actuators Kit (EM-008.2.2)
- Additional Type A Sensors Kit (EM-008.2.3)
- Additional type-B Plug-in Modules (EM-008.2.4)
- Digital content (BI-01).