What is 8051 Trainer Board?

A microcontroller is a small integrated circuit designed to do a specific operation in an embedded system. A typical microcontroller board contains a processor, memory, and input/output (I/O) peripherals on a single chip. There are different types of microcontrollers such as Arduino, Raspberry Pi, amongst which the microcontroller 8051 is used frequently. One of these is the MDE 8051 board, it is a useful tool for embedded control and robotics projects for both students and hobbyists. A powerful single-board microcontroller trainer based on the Maxim DC89C4XX family. This specific 8051 board has a lot of input/output connectors a supports several programming options which includes 8051 assembly and C programming language.

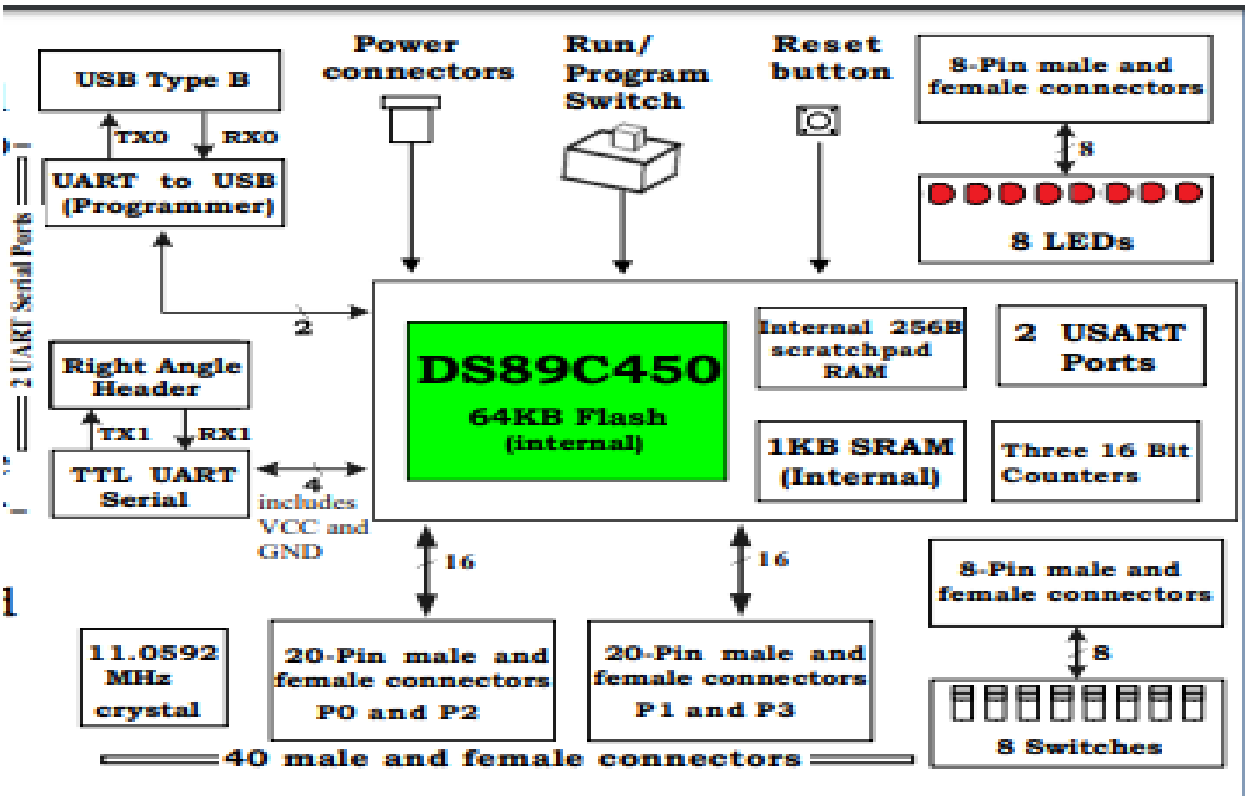


Figure 1-1. MDE 8051 Trainer Block Diagram.

Figure 1-2. 8051 Trainer Circuit Diagram.

MDE 8051 Trainer Components:

The MDE 8051 trainer board contains a power supply, dual serial ports, a second serial port via right angle header, a reset button, a jumper to pull-up PORT 0, a slide switch for programming and female/male headers to access all ports. It also has 8 switches and buffered LEDs for connection to the microcontroller, bread board or peripheral devices. It also provides access to pins of the 8051 microcontroller through SIP male and female connectors for wiring to bread board. By flipping the slide switch to program or run, one can program the microcontroller through using a terminal program.

MDE 8051 Trainer Features:

- A Maxim Integrated DS89C450 microcontroller (an 8051/52 compatible) with 64Kbytes of on-chip Flash memory.
- Eight on-board switches accessible via both male and female connectors.
- Eight on-board LEDs accessible via both male and female connectors.
- An on-board +5V voltage regulator.

- Two 20-pin male and female connectors for quickly hooking up wires.
- Support for the Maxim Integrated on-chip serial programmer.
- A Run/Program slide switch.
- An integrated USB to Serial port.
- A TTL right angle header to the second Serial COM port.
- Four threaded stand offs to be easily mounted onto a chassis.
- Compact design: Dimensions: 3.44”(W) x 3.46” (L) x 1.47”(H)
- Provision of a 2x4 header for an USB to Serial conversion cable.

Key Features:

- **80C52 Compatible.**
    - 8051 Pin and Instruction-Set Compatible
    - Four Bidirectional I/O ports.
    - Three 16-Bit Timer Counters.
    - 256 Bytes Scratchpad RAM
- **On-Chip Memory**
    - 16kB Flash Memory
    - In-System Programmable through Serial Port
    - 1kB SRAM for MOVX
- **ROMSIZE Feature**
    - Selects Internal Program Memory Size from 0 to 16k
    - Allows Access to Entire External Memory Map
    - Dynamically Adjustable by Software
- **High-Speed Architecture**
    - 1 Clock-Per-Machine Cycle
    - DC to 33MHz Operation
    - Single-Cycle Instruction in 30ns
    - Optional Variable Length MOVX to Access Fast/Slow Peripherals
    - Dual Data Pointers with Auto Increment/Decrement and Toggle Select
    - Supports Four Paged Modes
- **Power Management Mode**
    - Programmable Clock Divider
    - Automatic Hardware and Software Exit
- **Two Full-Duplex Serial Ports**
- **Programmable Watchdog Timer**

- **13 Interrupt Sources (Six External)**
- **Five Levels of Interrupt Priority**
- **Power-Fail Reset**
- **Early Warning Power-Fail Interrupt**

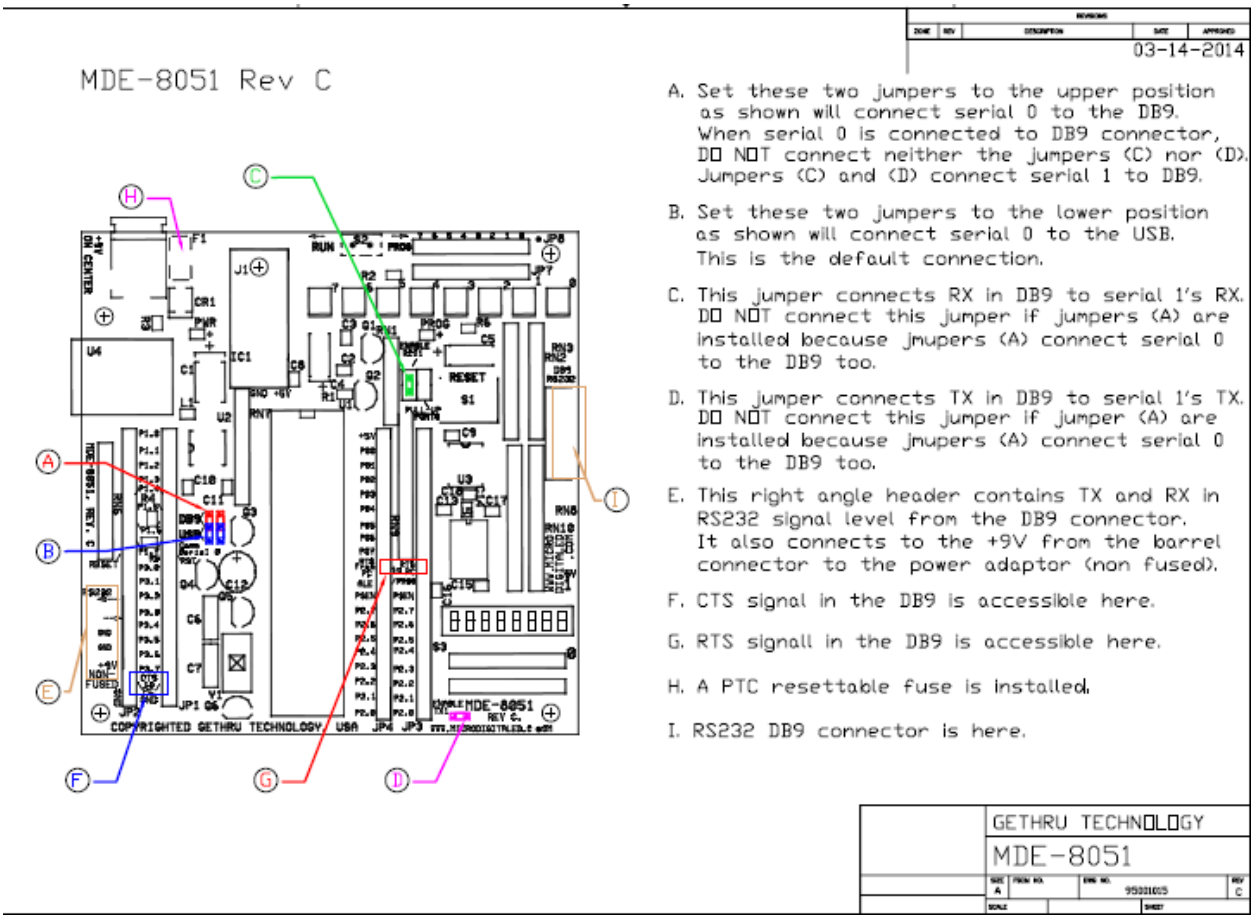
Sample Codes:

List of sample codes can be found in the link below:

http://www.microdigitaled.com/8051/Code/8051_codes.htm

Conclusion:

In conclusion, even though 8051 trainer board is a very useful microcontroller board we could not find any projects that can be associated with this specific board to date. We only found some sample codes that can be used to program a specific task. All industry-based projects (including an Automatic Plant Irrigation System) were posted using an outdated version of the 8051 board.



Reference:

https://reference.digilentinc.com/_media/mde_8051/mde8051_rm_reva1.pdf

https://www.maximintegrated.com/en/products/microcontrollers/DS89C420.html

https://www.artisantg.com/info/ATGjtbas.pdf

https://store.digilentinc.com/mde-8051-trainer-retired/