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MCBSTM32E
Quick Start Guide

Getting Started and Blinky Example

This **Quick Start Guide** introduces the MCBSTM32E boards for the STMicroelectronics **STM32F103ZE** device. It shows how to install the ARM software development tools and run a variety of example projects.
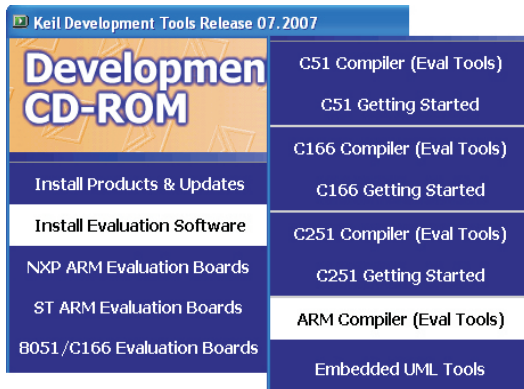
Installing the Software

To install the evaluation version of the ARM Microcontroler Development Kit (MDK) from a CD-ROM
- Insert the CD-ROM into your PC.

If the opening screen does not appear, run SETUP from the CD root directory
- Click Install Evaluation Software, then ARM Compiler (Eval Tools)
- Follow the setup program instructions

Note: The first MCBSTM32E boards shipped without a CD-ROM. An evaluation version of MDK is available for download from http://www.keil.com/demo/.

Connecting to your Target

The target is powered via your PC, through its USB port. The Keil ULINK family of adapters connect the USB port of your PC to the JTAG port of your target board allowing you to download and debug embedded programs running on your target hardware.

ULINK2 and ULINK-ME support JTAG and Serial-Wire Debug (SWD) for debugging of ARM-based targets.

Using ULINK2

The ULINK2 Adapter connects to the MCBSTM32E using the 20-pin ribbon cable.

Using ULINK-ME

The ULINK-ME Adapter connects directly to the 20-pin JTAG connector on the MCBSTM32E.
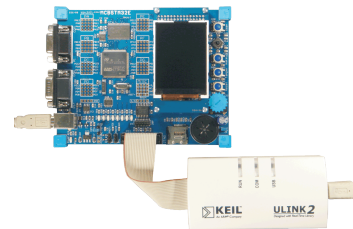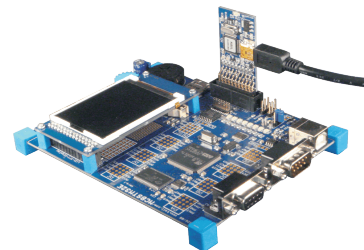

Blinky Example

This example demonstrates the ease of downloading and debugging an application on a target board.

It can be found at:
    C:\Keil\ARM\Boards\Keil\MCBSTM32E\Blinky

To use this example

- Start Vision
- Open the Blinky.uv2 project file
  Project - Open

- Compile and link the Blinky application
  Project - Build

- Program the application into on-chip Flash ROM
  Flash - Download

- The LEDs on the target are controlled by the potentiometer setting. As the setting increases, the LEDs scroll faster.

- Start debug mode

Using the debugger commands, you may:

- Single step through code

- Set breakpoints

- Run the application

- Review variables in the watch window

- Reset the device to re-run the application

- Use the yellow arrow (program counter) to view the current assembler or C statement

www.keil.com/mcbstm32e

Real-Time Trace using SWV

This example demonstrates the value of Real-Time Trace using the Serial Wire Viewer (SWV) features of STM32 microcontrollers.

It can be found at:
    C:\Keil\ARM\Boards\Keil\MCBSTM32E\STLIB_Blinky
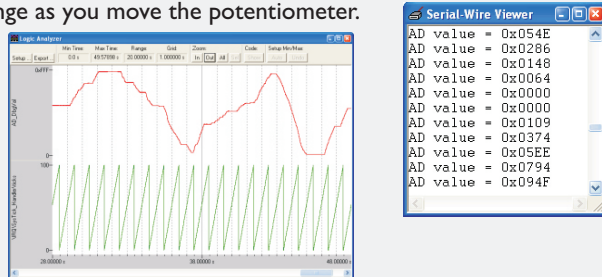
To use this example:
- Select target build option - STM32 Trace C

STM32 Trace C

- Compile and download to Flash.
- Start Debug mode.
- Select the Serial Wire Viewer and Logic Analyzer
        View - Serial Window - Serial Wire Viewer
        View - Logic Analyzer

- The A/D converter output will be displayed in both the Serial Wire Viewer Window and the Logic Analyzer. These values change as you move the potentiometer.

AD value = 0x054E
AD value = 0x0286
AD value = 0x0148
AD value = 0x0064
AD value = 0x0000
AD value = 0x0000
AD value = 0x0109
AD value = 0x0374
AD value = 0x05EE
AD value = 0x0794
AD value = 0x094F

Application note 197 provides full information on Real-Time Trace,
http://www.keil.com/appnotes/docs/apnt_197.asp

USB - HID Demo

This USB example project implements a Human Interface Device (HID), and connects directly to your PC via the USB. No special USB drivers are required, since the HID support is already built into Windows 2000 and Windows XP.

It can be found at:
        C:\Keil\ARM\Boards\Keil\MCBSTM32E\USBHID

To use this example:
- Start Vision
- Open the HID.uv2 project file and download to Flash
        Project - Open
        Flash - Download
- Cycle power on the target so that your PC recognizes it as an HID device
    - Install the USB Client application which can be found at:
        C:\Keil\ARM\Utilities\HID_client\Release
- Select the evaluation board from the drop-down menu

- Checking or unchecking the boxes in the Output (LEDs) group turns the MCBSTM32E Board's LEDs on and off.
- Inputs (Buttons) show the status of the on-board buttons

Running Blinky in Simulation

The Simulator Target of the Blinky example demonstrates the extra debug features of   Vision when running in simulation.
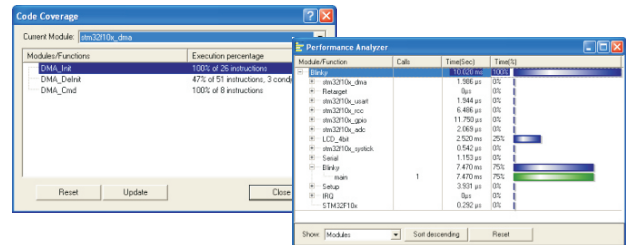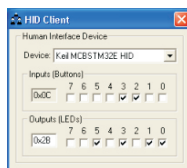
It can be found at:
        C:\Keil\ARM\Boards\Keil\MCBSTM32E\Blinky

To use this example in simulation:
- Select target build option - Simulator

Simulator

- Compile project
- Start Debug mode
- Open the Performance Analyzer and Logic Analyzer Windows
        View - Performance Analyzer Window
        View - Code Coverage Window
- Step through the code

- The Code Coverage Window shows what percentage of the instructions of each function have been executed
- The Performance Analyzer Window shows how much time the processor has spent in each function
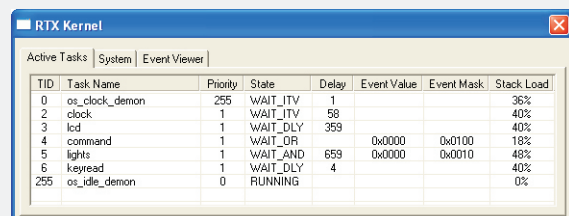
Traffic example with RTX

This example uses interrupts to control a traffic light system running on the RTX real-time operating system.

It can be found at:
        C:\Keil\ARM\Boards\Keil\MCBSTM32E\RTX_Traffic

To use this example:
- Start   Vision
- Open the Traffic.uv2 project file
        Project - Open
- Compile and link the application, then program it into on-chip Flash ROM
        Project - Build Target
        Flash - Download
- The LEDs will begin to flash in a controlled manner
- The tasks running in the application may be viewed from the debugger window
        Peripherals - RTX Kernel