

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

Keil Development Tools Release 07.2007 Developmen C51 Compiler (Eval Tools) **ODE:O** C51 Getting Started C166 Compiler (Eval Tools) **Install Products & Updates** C166 Getting Started Install Evaluation Software C251 Compiler (Eval Tools) NXP ARM Evaluation Boards C251 Getting Started ST ARM Evaluation Boards ARM Compiler (Eval Tools) 8051/C166 Evaluation Boards Embedded UML Tools

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/.

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

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.



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

Using the debugger commands, you may:

- Fingle 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



Ŧ

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.



8	Serial-Wi	re	Viewer		×
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		~
21					
<u> </u>		_		1	111

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

Active Tasks System Event Viewer										
TID	Task Name	Priority	State	Delay	Event Value	Event Mask	Stack Load			
0	os clock demon	255	WAIT ITV	1			36%			
2	clock	1	WAIT ITV	58			40%			
3	lcd	1	WAIT DLY	359			40%			
4	command	1	WAIT OR		0x0000	0x0100	18%			
5	lights	1	WAIT AND	659	0x0000	0x0010	48%			
6	keyread	1	WAIT DLY	4			40%			
255	os idle demon	0	BUNNING				0%			