



# THE DATASHEET OF ST7MDT40-EMU3



## Full-featured, real time emulator series for ST7

Data Brief

The **ST7-EMU3 series of emulators** is the third generation of high-end emulators for ST7. EMU3 series emulators are designed to speed up the development of complex software applications for ST7 microcontrollers by providing a complete range of advanced debugging features. In combination with ST7 Visual Develop (STVD7) and ST7 Visual Programmer (STVP7), they provide start-to-finish control of application development – from building and debugging applications, to programming your ST7.

The EMU3 series emulators deliver start-to-finish control by providing both emulation and In-Circuit Communication (ICC) configurations from a single platform.

In the emulation configuration, the EMU3 probe and STVD7 software allow debugging while connected an application board in place of the target ST7. This configuration offers the most complete range of debugging features, including trace, advanced breakpoints and performance analysis. In addition, the EMU3 comes with all the adapters and connectors to connect to the application board in place of the target ST7.

The ICC configuration allows In-Circuit Debugging (ICD) of the application while it runs on the ST7 that is installed on your application board. Once debugging is completed, the ICC configuration allows In-Circuit Programming (ICP) of ST7 Flash microcontrollers on your application board or an ST7 Socket Board.

### Key features

#### Emulation Features

- Unlimited breakpoints with counter and condition
- Two output triggers
- Nine external input triggers
- 256K real-time trace recording with timestamp



- Memory read/write on the fly
- Low voltage emulation from 1.8 to 5.5 V
- Programmable clock frequency from 32 KHz up to 16 MHz
- Performance Analysis
- Four-level logic sequencer that allows you to perform specific actions such as:
  - Stop program execution
  - Start/stop trace recording,
  - Record a snapshot in the trace,
  - Output signals via the two output triggers

These actions can be coordinated with the occurrence of a specific event or a series of events such as:

- an event at an address or range of addresses,
- a specific data value with bit mask,
- a read, write or read/write access,
- stack operation access

...or any combination of these.

## In-circuit debugging features

The EMU3 series emulators and the STVD7 integrated development environment also allow you to in-circuit debug your application as it runs on an ST7 with debug modules.

ICD features include:

- Real-time control of application execution
- Read and write memory contents and ST7 registers
- Configuration of option the byte
- Unlimited software breakpoints in address ranges corresponding to RAM and XFlash memory
- Advanced breakpoints including:
  - Break on data access in/outside of address range or at one of two addresses
  - Break on data value at an address
  - Break on opcode fetch (within/ outside of address range)
  - Break on sequential opcode fetch's
  - Break on opcode fetch, or data access at specified addresses
  - Break on conditional stack write, or opcode fetch at specified address
  - Break on conditional stack write, or data access at specified address

## In-circuit programming features

The EMU3 series emulators along with STVP7, or STVD7 software, allow you to in-circuit program and in-circuit debug ST7 devices with Flash memory. Refer to the **ST7-EMU3 User Manual** for complete instructions about using the ICC Add-on and installing an ICC connector on your application board.

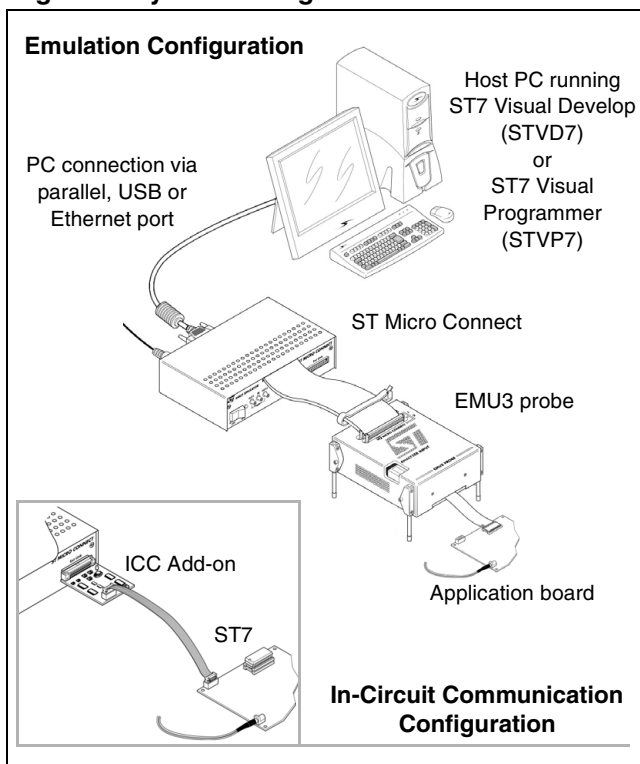
## Emulator architecture

**ST Micro Connect** – provides the communication interface with host PC via parallel, USB or Ethernet connection in both the Emulation and ICC configurations.

**EMU3 Probe** – contains the system's emulation boards including the Target Emulation Board (TEB), which allows emulation of a specific ST7 or sub-family of ST7 devices. It connects to the application board via furnished, package-specific adapters and sockets.

**ICC Add-on** – allows the communication between the host PC and the ST7 microcontroller with Flash memory on the application board for in-circuit debugging and in-circuit programming. This requires installation of a 10-pin, ICC connector on the application board.

Figure 1: System configurations



**ST7 Visual Develop** – Integrated Development Environment (IDE) that runs on the host PC connected to the emulator and allows you to build and debug application software and then program it to the target ST7.

**ST7 Visual Programmer** – Software programming interface that runs on the host PC connected to the emulator and provides advanced controls for reading, programming and verifying the Flash memory of the target ST7.

## Ordering information

The EMU3 series emulators and accessories can be ordered from STMicroelectronics' sales offices and distributors. Refer to the on-line product selector at [www.st.com/mcu](http://www.st.com/mcu) for the exact emulator ordering code for each supported ST7 microcontroller.

**Table 1. Ordering emulators and accessories**

Order code type	Description
<b>Emulator</b>	
ST7MDTxx-EMU3	Order an <b>ST7-EMU3 emulator</b> with the connection accessories for all packages for the supported ST7 sub-family, plus the ICC Add-on for in-circuit debugging/programming of ST7 Flash microcontrollers.
<b>Spare parts</b>	
ST7MDTxx-TEB	Order a <b>Target Emulation Board (TEB)</b> to adapt any EMU3 series emulator for emulation of the ST7 sub-family supported by the specified TEB. The TEB comes with connection accessories for all packages for the supported ST7 sub-family.
AC7MDTxx-xxxx	Order extra package-specific <b>connection accessories</b> (adapters, device adapters, sockets) for an EMU3 series emulator.
AS-xxxxx	Order extra package-specific <b>sockets</b> to solder to the application board allowing connection of the EMU3 series emulator.
ST7-ICC/ADDON	Order an extra <b>ICC Add-on</b> for connection of an EMU3 series emulator to the ST7 Flash microcontroller on the application board for in-circuit debugging or in-circuit programming.

## For more information...

The following documents are available for free download at the ST internet site:

**ST7-EMU3 Emulator User Manual** - Information about setting up an ST7-EMU3 series emulator for emulation or in-circuit debugging/programming. This manual provides information that is common to all emulators in the EMU3 series.

**ST7xxxx-EMU3 Probe User Guide** - Information about connecting the EMU3 emulator to your application board in the emulation configuration. These documents provide information that is specific to each type of EMU3 series emulator (ST7MDTxx-EMU3 emulator).

**ST7 Visual Develop User Manual** - Information and tutorials to help you build and debug your application software and program it to your ST7 using the STVD7 Integrated Development Environment and an EMU3 series emulator.

**ST7 Visual Programmer online help** - Information to help you program your application to your ST7 using this Windows-based programming software and an ST7-EMU3 series emulator.

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**ST7xxx Datasheet** - Complete information about the features of your target ST7 microcontroller.

## Revision history

**Table 2. Document revision history**

Date	Revision	Changes
24-January-2006	1	Initial release.
25-July-2006	2	<ul style="list-style-type: none"><li>• Minor text corrections</li><li>• Addition of <a href="#">Table 1</a>. with explanation of ordering codes for emulators and spare parts.</li></ul>

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