# ST7-EMU3

## Full-Featured, Real Time Emulator Series for ST7

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), this series of emulators provide you with unprecedented control of application development – from building and debugging your application, to programming your ST7 microcontroller.

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

In the emulation configuration, the EMU3 probe and STVD7 software allow you to debug your program while connected to your application board in place of your target ST7. This configuration gives you the most complete range of debugging features, including advanced breakpoints and performance analysis. In addition, the EMU3 includes everything you will need to connect it to your application board.

The ICC configuration allows you to In-Circuit Debug (ICD) your application while it runs on an ST7 that is installed on your application board and that has the necessary debug modules. When you are finished debugging your application, the ICC configuration allows you to In-Circuit Program (ICP) your application to your ST7 microcontrollers.

## Emulator Architecture

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

**EMU3 Probe** – Contains the system's emulation boards including the Target Emulation Board (TEB), which allows it to emulate a specific family of ST7 devices. It connects to your application board via furnished adapters and sockets that are specific to the target device's package.
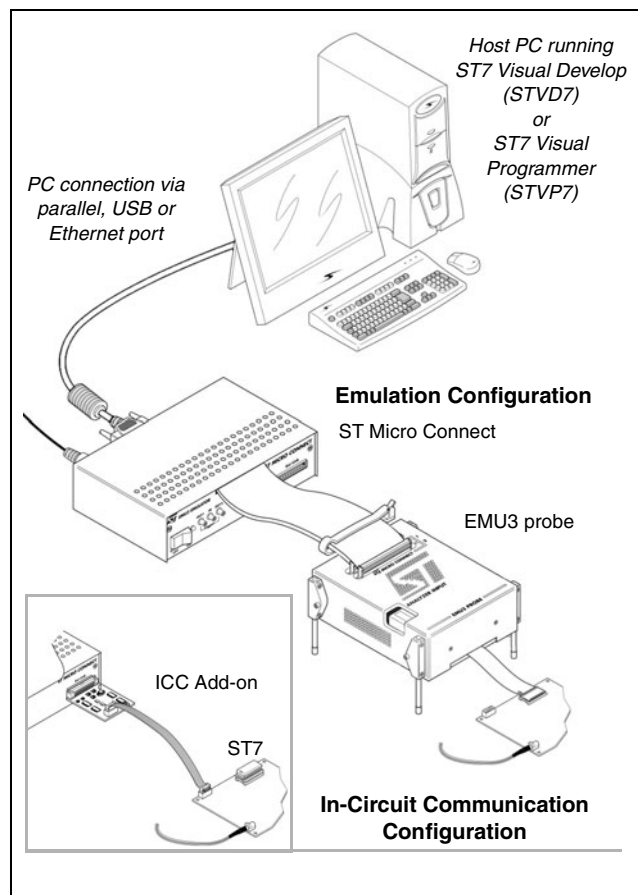


*Host PC running ST7 Visual Develop (STVD7) or ST7 Visual Programmer (STVP7)*

*PC connection via parallel, USB or Ethernet port*

**Emulation Configuration**

ST Micro Connect

EMU3 probe

ICC Add-on

ST7

**In-Circuit Communication Configuration**

**Figure 1: System configurations**

**ICC Add-on** – Permits communication with the ST7 on your application board for in-circuit debugging and in-circuit programming. Requires installation of a 10-pin, ICC connector on your application board.

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

**ST7 Visual Programmer** – Software programming interface that runs on the host PC connected to the emulator and allows you to program your application to your ST7.

## Emulation Features

In the emulation configuration, the EMU3 series emulators in combination with STVD7, provide the most advanced and complete range of debugging features, including:

- Unlimited breakpoints with counter and condition
- Two output triggers
- Nine external input triggers
- 256K real-time trace recording with timestamp
- 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
- Reading and writing of memory contents and ST7 registers
- Configuration of option byte
- Unlimited software breakpoints in address ranges corresponding to RAM and XFlash memory
- Advanced breakpoints including
  - Break on data value at a given address.

- Break on Opcode Fetch (within address range, outside of address range)
- Break on two sequential Opcode Fetch's
- Break on data access (within address range, outside of an address range, at one of two addresses)
- Break on Opcode Fetch, **or** data access at given addresses.
- Break on conditional stack write, **or** Opcode Fetch at a given address
- Break on conditional stack write, **or** data access at a given address.

## In-Circuit Programming Features

The EMU3 series emulators along with STVP7, or STVD7 software, allow you to in-circuit program ST7 devices with Flash memory. You can program your ST7s on your application board (via the ICC Add-on and the ICC connector installed on the your application board), or on an ST7SBxx socket board.

## For more information...

The following documents are available for free download from our internet site:

***ST7-EMU3 Emulator User Manual*** - Information about setting up an ST7-EMU3 series emulator in the emulation or ICC configuration. 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 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 ST7-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.

***ST7xxxx Datasheet*** - Complete information about the features of your target ST7 microcontroller.