SBX-SOCKETBOARD
universal socket boards for ST microcontrollers

Introduction

The SBX universal socket boards complement all programming tools that are equipped for in-circuit programming (ICP) via ICC, SWIM, or JTAG. For these programming tools and emulators, the socket boards provide the sockets required to program any ST 8 or 32-bit Flash microcontroller without having to install it on an application board.

Universal socket boards are available for different types of package, and different types of connectors (ICC, SWIM or JTAG).

Figure 1.   SBX universal socket board
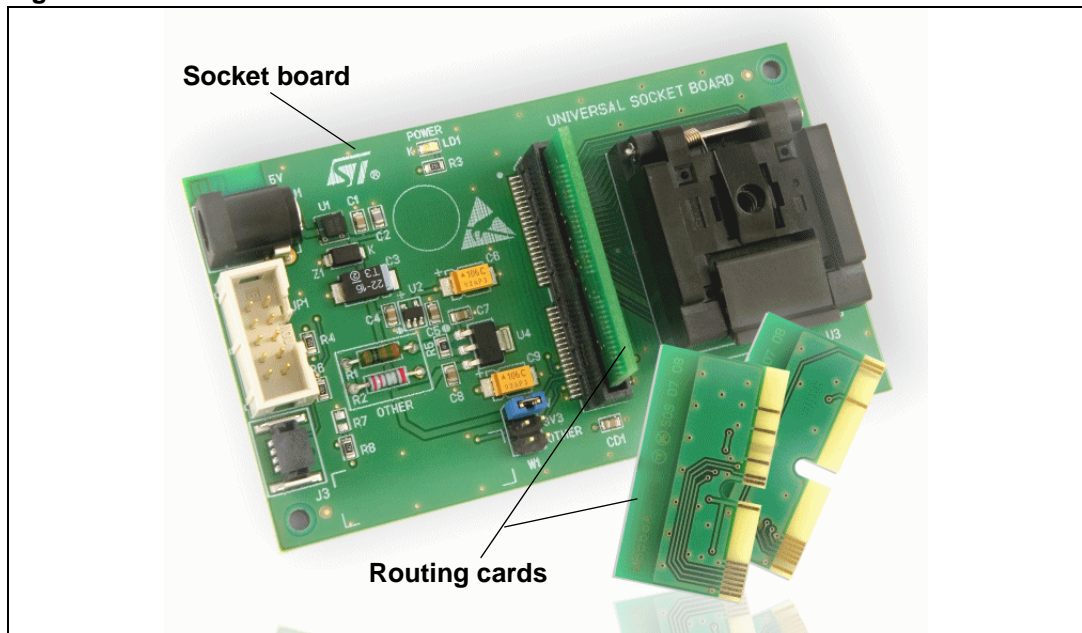
■   The programming socket is designed to hold a specific MCU package.

■   The routing card provides the specific signal routing required for programming your target MCU. Routing cards are provided for all supported MCUs.

■   The ICC, SWIM or JTAG connectors on the board are used to connect to your programming tool. The programming tool then serves as the hardware interface with your host PC.

Note: *The SBX universal socket boards are intended to program small numbers of microcontrollers (for example, prototypes in the development stage). For mass production programming, we recommend using the appropriate gang or automated programmer.*

This manual will help you set up your universal socket board and connect it to your programming tool. It also provides information on the programming features of the socket board.

1 Ordering information

The SBX socket boards can be ordered from STMicroelectronics' sales offices and distributors using the order codes provided on the universal socket board product page on *www.st.com.* Do a keyword search on **SBX-SOCKETBOARD**.

The latest information on supported packages is also available on the universal socket board product page.

2 Socket board connectors

The SBX socket boards include the necessary connectors for in-circuit programming. The socket board delivered to you includes the appropriate connectors for your Flash microcontroller:

● either JTAG and SWIM connectors, see *Figure 2*
● or ICC and SWIM connectors, see *Figure 3*

Figure 2.   SBX socket board with JTAG and SWIM connectors
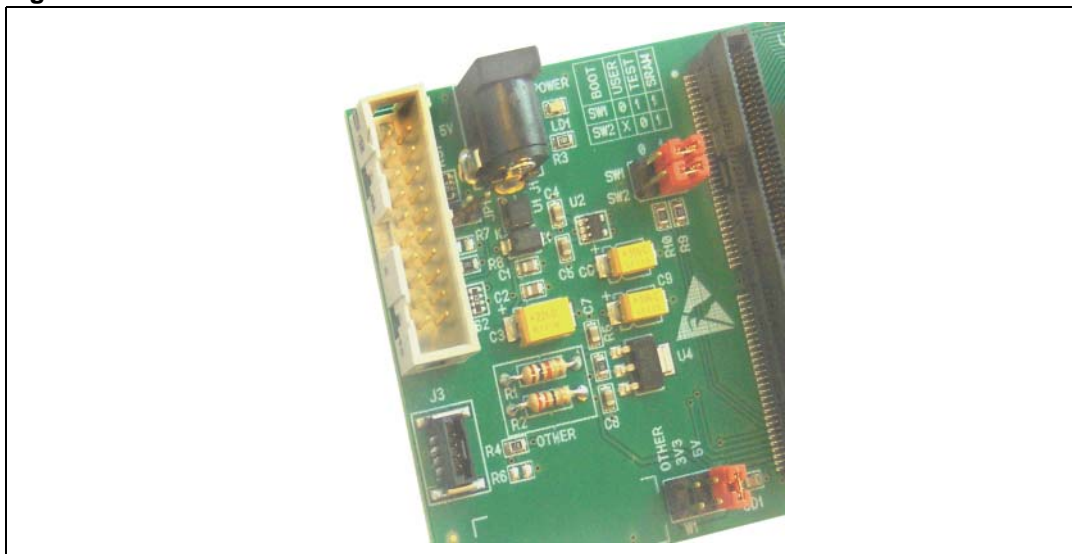
www.BDTIC.com/ST

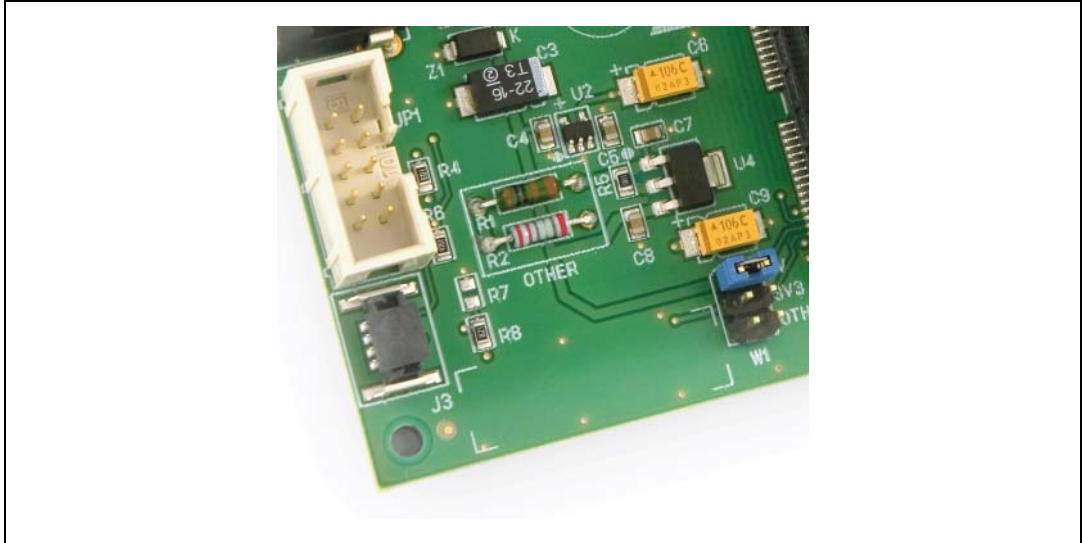**Figure 3.**   **SBX socket board with ICC and SWIM connectors**

3 Delivery checklist

The SBX socket boards are delivered with the following:

● One socket for a specific MCU package (the package type supported depends on the type of board that you ordered)

● Routing cards for all the microcontrollers supported by the socket board

● One power supply

4 Configuring and connecting your socket board

This section explains how to set up your socket board and connect it to your programming tool. It includes:

● *Configuring the power supply for your MCU*
● *Installing the routing card for your MCU*
● *Connecting your programming tool*

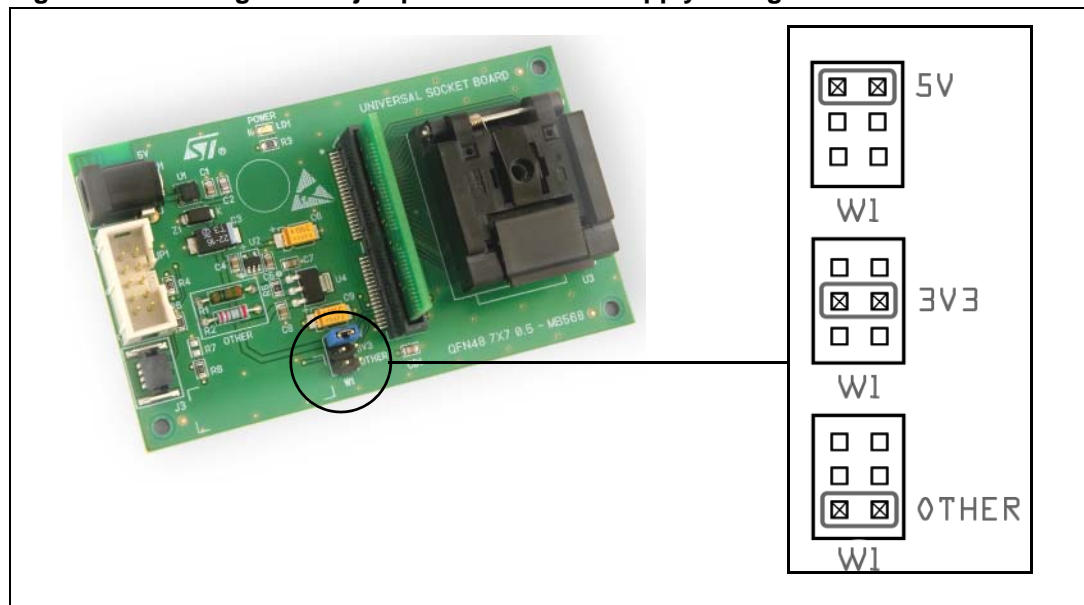## 4.1 Configuring the power supply for your MCU

Your socket board allows you to configure the power supply for your microcontroller. As standard options, you can choose between 3.3V and 5V by changing the position of the W1 jumper. In addition, you can configure other voltages supported by your microcontroller by installing the appropriate resistors in series in the area labeled **OTHER** on your socket board.

Note: *When setting the W1 jumper, you must ensure that the selected voltage is supported by both your microcontroller and by the programming tool that you are using to connect the socket board to your host PC. Refer to the datasheet for your microcontroller and to the user manual for your programming tool for more information.*

Configuring the power supply for 3.3V or 5V

To select 3.3V or 5V, simply set the W1 jumper to the appropriate position, as shown in *Figure 4*.

Figure 4.   Setting the W1 jumper to select the supply voltage

Configuring the power supply for other voltages

To configure your universal socket board to use a supply voltage other than 3.3V or 5V, you must calculate the serial resistance required and change the resistors in the area labeled **OTHER** on the board if necessary.

On the board delivered to you, the two resistors installed in the **OTHER** area have the following values:

R1 = 1kΩ, R2 = 20Ω

With these resistor values, the power supply is 2.4V.

To change the supply voltage, you must re-calculate the resistor values required, as described in the following procedure.

1. Calculate the serial resistance for the supply voltage that you want, using the formula:

$$V_{Other} = 1.25 \cdot \left(1 + \frac{R_1 + R_2}{1100}\right)$$

$$R_1 + R_2 = 880(V_{Other} - 1.25)$$

R_1 plus R_2 is the serial resistance in Ω to be installed in the **OTHER** area on the universal socket board.

V_{Other} is the required voltage.

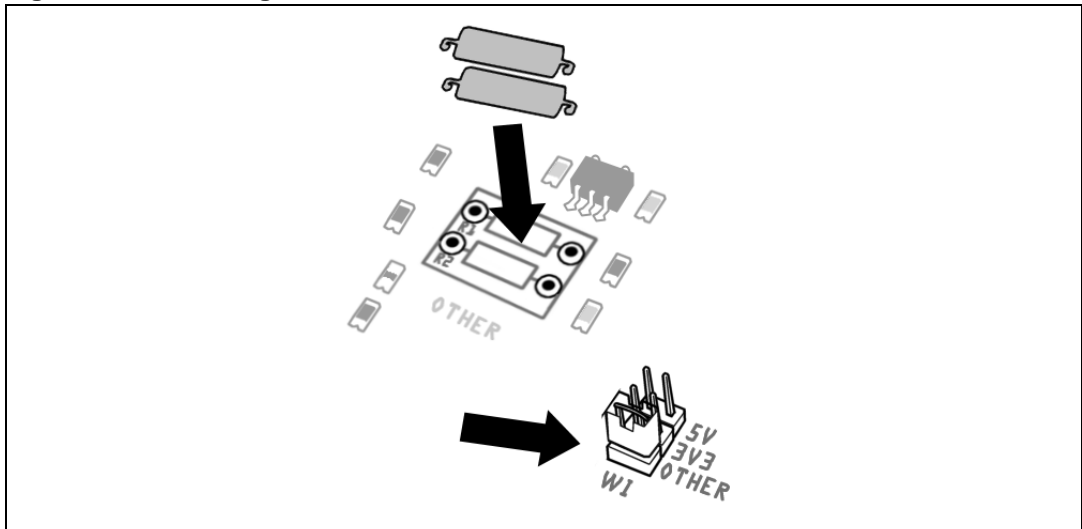For example, to obtain a supply voltage of 3V:

$$R_1 + R_2 = 880(3 - 1.25)$$

$$R_1 + R_2 = 1540\Omega$$

2. Install the necessary resistors in the **OTHER** area on the universal socket board.

   Figure 5 shows a possible solution for the example given in Step *1.*

Figure 5.   Installing serial resistors

3. Set the W1 jumper to the **OTHER** position (see *Figure 4*).

4.2 Installing the routing card for your MCU

Each routing card corresponds to an MCU pinout. You must choose the card that corresponds to your microcontroller and insert it in the connector on the universal socket board. There is only one possible orientation for installing the routing card in the J2 connector on the socket board.

Each socket board supports a particular type of package. It includes all the routing cards for microcontrollers available in that package. For example, the LQFP32 socket board (SBX-QP32BC) includes all the routing cards for microcontrollers available in this package.

To help you determine which routing card to use for your microcontroller refer to *www.st.com.* The information is regularly updated on the universal socket board product page which you can reach rapidly by a keyword search on **SBX-SOCKETBOARD**.

4.3 Connecting your programming tool

You can connect your programming tool to the universal socket board using the ICC/SWIM or JTAG connector on the top of the board. The connectors available depend on the board that you ordered and the MCUs that it supports.

The following sections explain how to set up your socket board when:

- *Connecting via ICC*
- *Connecting via SWIM*
- *Connecting via JTAG*

Connecting via ICC

To connect to the socket board with an ICC cable:

1. Plug the ICC cable into the 10-pin HE-10 type connector on your programming tool and your socket board.

   The ICC cable is provided with your programming tool.

2. Set the W1 power jumper to the appropriate position for your microcontroller (3.3V, 5V or other).

   For information on configuring the W1 jumper, refer to *Configuring the power supply for 3.3V or 5V*, or *Configuring the power supply for other voltages on page 5*.

3. Connect the power supply for the socket board and the programming tool.

   Once connected, the green Power LED should light up and remain lit.

You are ready to program your microcontroller.

Connecting via SWIM

To connect to the socket board with SWIM cable:

1. Plug the SWIM cable into the 4-pin ERNI type connector on your programming tool and your socket board.

   The SWIM cable is provided with your programming tool.

2. Set the W1 power jumper to the appropriate position for your microcontroller (3.3V, 5V or other).

   For information on configuring the W1 jumper, refer to *Configuring the power supply for 3.3V or 5V*, or *Configuring the power supply for other voltages on page 5*.

3. Connect the power supply for the socket board and the programming tool.

   Once connected, the green Power LED should light up and remain lit.

You are ready to program your microcontroller.

Connecting via JTAG

To connect to the socket board using the 20-pin JTAG connection:

1. Plug the JTAG cable into the 20-pin JTAG connector on your programming tool and your socket board.

   The JTAG cable is provided with your programming tool.

2. Select the boot configuration, using the W2 jumper, as shown in *Table 1*.

Table 1. W2 boot configuration

	Boot in SRAM (default)	Boot in Flash	Boot in test Flash
SW1 (Boot 0) SW2 (Boot 1)	0 1	0 1	0 1

3. Set the W1 power jumper to the appropriate position for your microcontroller (3.3V, 5V or other).

   For information on configuring the W1 jumper, refer to *Configuring the power supply for 3.3V or 5V*, or *Configuring the power supply for other voltages on page 5*.

4. Connect the power supply for the socket board and the programming tool.

   Once connected, the green Power LED should light up and remain lit.

You are ready to program your microcontroller.

Appendix A EMC conformity and safety requirements

This product respects the EMC requirements of the European guideline 89/336/EEC under the following conditions:

● Any tester, equipment, or tool used at any production step, or for any manipulation of semiconductor devices, must have its shield connected to ground.

● All provided ferrites must be attached as described in the hardware installation instructions of the relevant user manual.

● The product must be placed on a conductive table top, made of steel or clean aluminum, grounded through a ground cable. Before every contact with the emulator, the operator must touch the surface of the grounded worktable just behind the back panel of the emulator. All manipulation of finished goods must be done at such a grounded worktable.

● The worktable must be free of all non-antistatic plastic objects.

● It is recommended that you wear an antistatic wrist or ankle strap, connected to the antistatic floor covering or to the grounded equipment.

● If no antistatic wrist or ankle strap is worn, before each manipulation of the powered-on tool, you must touch the surface of the grounded worktable just behind the back panel of the emulator.

● It is recommended that antistatic gloves or finger coats be worn.

● It is recommended that nylon clothing be avoided while performing any manipulation of parts.

Appendix B   Product support

If you experience any problems with this product, or if you need spare parts or repairs, contact the distributor or the STMicroelectronics sales office where you purchased the product.

In addition, at our Internet site **www.st.com**, you will find a complete listing of ST sales offices and distributors, as well as documentation, software downloads and user discussion groups to help you answer questions and stay up to date with our latest product developments.

Software updates

All our latest software and related documentation are available for download from the ST microcontrollers support site, **www.st.com**. For information about firmware and hardware revisions, call your nearest distributor or ST sales office.

If you are using software from a third-party tool provider, please refer to the third-party for software product support and downloads.

Hardware spare parts

Your development tool comes with the hardware you need to set it up, connect it to your PC and connect to your application. However, some components can be bought separately if you need additional ones. You can order extra components, such as sockets and adapters, from STMicroelectronics**,** from the component manufacturer or from a distributor.

To help you find what you need, a listing of accessories for ST development tools is available on the ST microcontrollers support site, **www.st.com**.

Sockets

Complete documentation and ordering information for P/TQFP sockets from Yamaichi, Ironwood, CAB, Enplas and Erni are provided on their respective Internet sites.

Connectors

Complete documentation and ordering information for SAMTEC connectors is provided on the SAMTEC Internet site.

5 Revision history

Table 2. Document revision history

Date	Revision	Changes
29-Jan-2008	1	Initial release.

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