UM0414
User manual

ST7GEME4 evaluation board getting started

Introduction

The ST7GEME4 evaluation board aims to provide the user with a ready-to-use tool. It is connected to a PC through a USB interface. This board is based on the ST7GEME4 microcontroller with application software from GEMALTO pre-loaded in ROM memory. It is a full turnkey solution for immediate hands-on evaluation of data transmission to an external smartcard.

The directions in this guide are valid for Microsoft Windows XP platforms.

A complete reference design document with electrical diagram, bill of materials, and PCB recommendations are also available for development purposes (GemCore USB Pro / Gemcore Twin Pro application note).

For a complete ST7GEME4 performance overview, please refer to the *ST7GEME4 datasheet*. All these documents are available from an ST sales office.
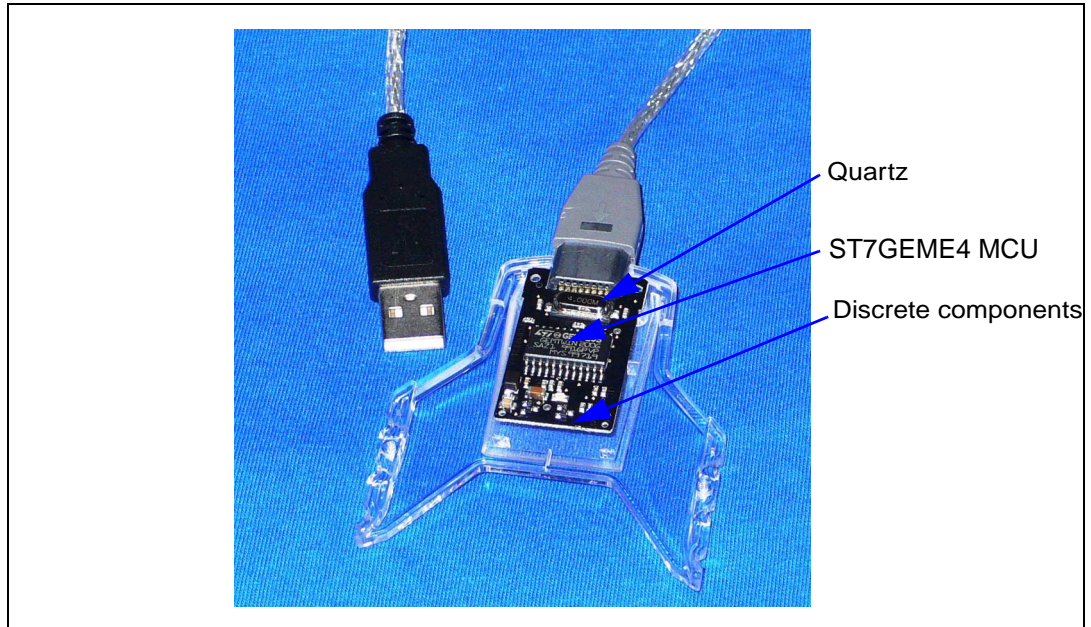
Contents

1 Board overview

Figure 1.   ST7GEME4 evaluation board

1.1 Board functional description

The Board is based on the ST7GEME4 microcontroller. It is a single IC solution with very few external passive components. ST7GEME4 directly controls the USB communication to the PC host through a connector. It also directly controls external smartcards through a standard connector. A few additional components provide:

● External clock source with a quartz

● Visual data communication via an LED

● Voltage step-up through SELF and DIODE pins

2 Installation and support

2.1 System requirements

The board is managed through a PCSC resource manager. The resource manager (smartcard service) is activated. This can be verified with the following steps:

● **RIGHT CLICK** on the desktop icon **My Computer**.

● Select the **Manage** submenu

● The available **Services** are listed in the **Services and Applications** section

● The **Smartcard** service must be initialized with:
STARTUP TYPE = AUTOMATIC
Also, the status of this service must be **Started**.

Figure 2.   Example screenshot of Services window
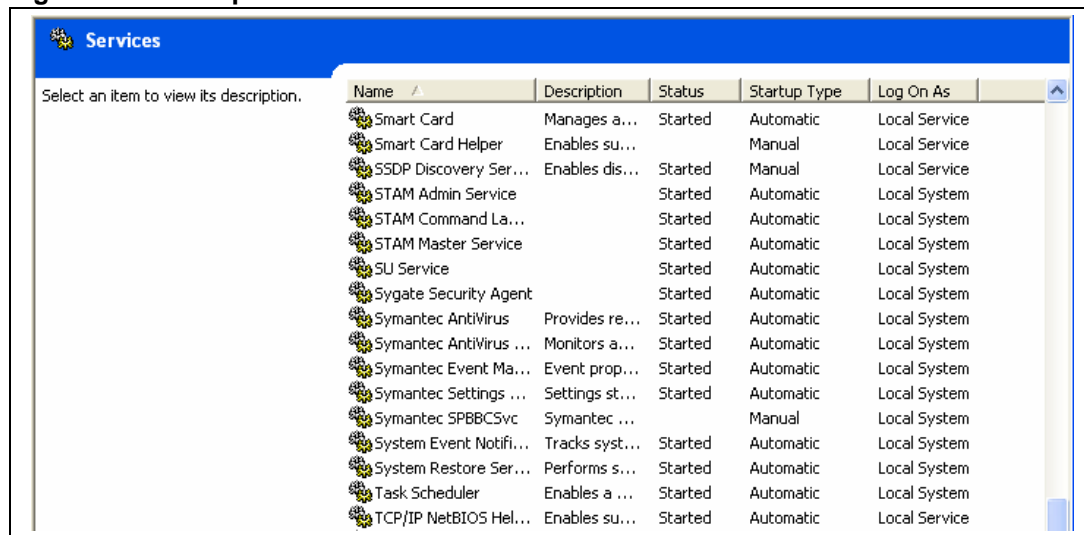
2.2 Driver installation

Several PCSC drivers are available free of charge on the following support website:
http://support.gemplus.com/gemdownload/readers/index.aspx

It is recommended to install the GemPC TWIN driver for the evaluation board.

2.3 Hardware installation

A simple USB cable is required to connect the board to a PC. The board is automatically detected and identified by the PC as a new smartcard reader.

This can be verified through the use of the **My Computer** (right click)**--> Manage**. Select the **Device Manager** application and the **Smartcard Reader USB** submenu where the eval board properties should now be highlighted.

Note that external smartcard must be inserted into the connector with the CHIP FACING DOWN. Push the card ALL THE WAY in the connector.

Note: *When the card is properly inserted, LED2 and LED0 turn on for a few seconds, then LED2 turns off and LED0 blinks.*

Figure 3. USB Smart Card reader properties
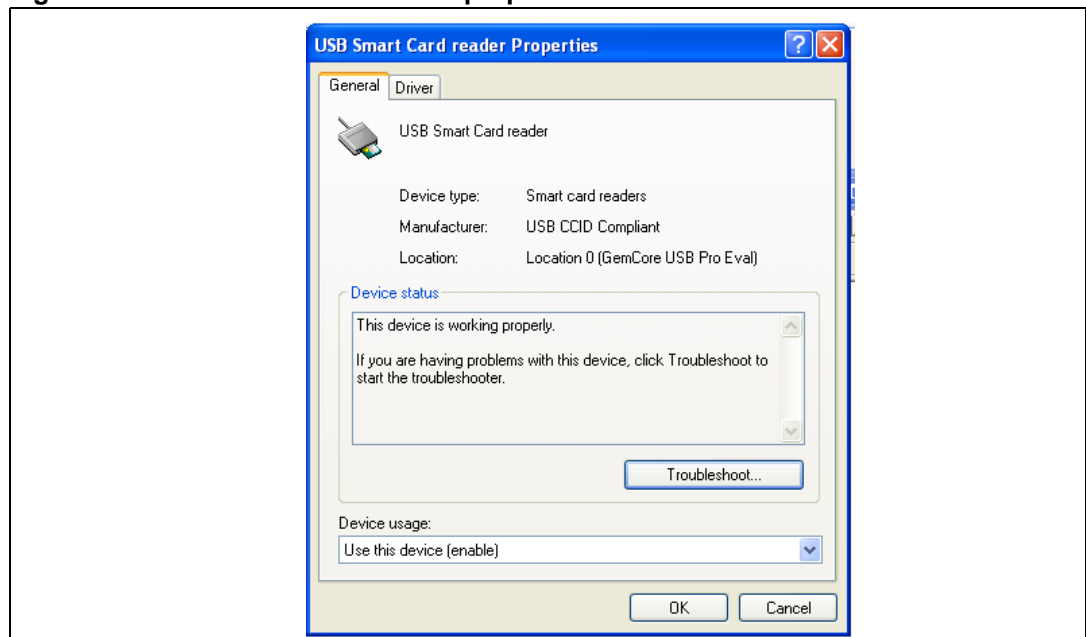
2.4 Diagnostic tools

Free tools can be downloaded from the support website at:

http://support.gemplus.com/gemdownload/readers/drivers.aspx?prodid=20

In particular, it is recommended to download the *SmartDiag* and *Gem_PCSC* tools to verify adequate access and transmission to the evaluation board.

The *SmartDiag* tool allows the user to verify that different PCSC readers are correctly identified and functional. A smartcard is necessary to obtain a complete report. Insert the card into the reader and click start. It is possible to obtain a log file.

Gem_PCSC is a sub routine tool utilized to send commands using the main PCSC functions. The user must have basic knowledge of PCSC functions to use the tool.
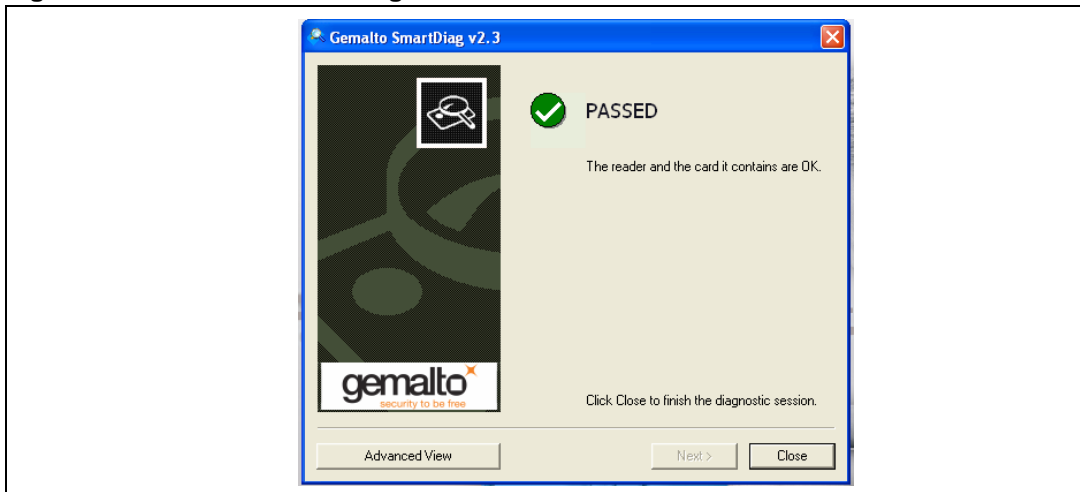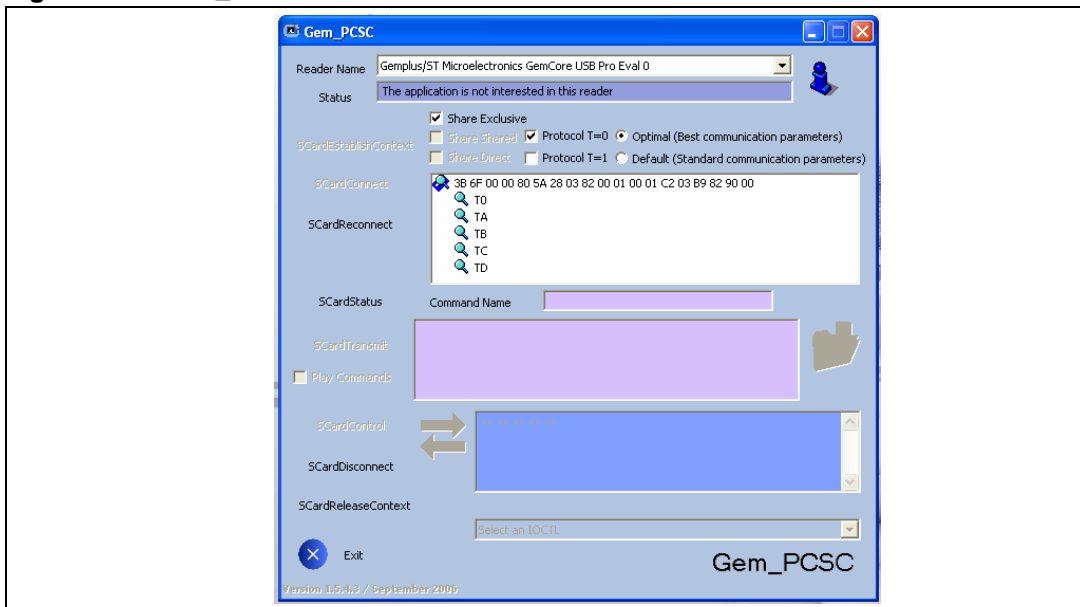
Figure 4.   Gemalto SmartDiag

Figure 5.   Gem_PCSC

2.5   More tools and support

More can be found at

http://support.gemplus.com/gemdownload/readers/drivers.aspx?prodid=20

APIs are available for developers. In particular:

● *CILK library*, addendum to the GBP library giving additional entry points. This allows the management of CCID serial and USB devices.

● *GSC synchron library* allowing management of synchron products such as: memory types gpm2k, gpm8k, etc…

www.BDTIC.com/ST

3 Revision history

Table 1.   Document revision history

Date	Revision	Changes
11-Apr-2007	1	Initial release.
29-Feb-2008	2	Replaced ST7GEM by ST7GEME4 root part number. Updated *Figure 1: ST7GEME4 evaluation board*. Removed note in *Section 1.1: Board functional description*. Changed *GemPCKey* into GemPC TWIN in *Section 2.2: Driver installation*.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

www.BDTIC.com/ST