Schlumberger

e-gate™ USB Smart Card

Installation Guide

Token Form Factor Connector

Desktop Form Factor Connector

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You will find the e-gate Smart Card Driver License Agreement (*egate_License.txt*) in the following directory: *\Program Files\Schlumberger\Smart Cards and Terminals\Smart Card Readers\e-gate\Docs*.

The e-gate Smart Card Driver License Agreement is also available from the Reflex Reader Technical Support website: *www.reflexreaders.com/Support/support.html*.

Your feedback about this manual is welcome! Comments, questions, and suggestions about any part of the Cyberflex® Access™ documentation library can be posted to the Docs & Samples Conference of the User Discussion Forums: *www.flexforum.com/cgi-bin/dcforum/dcboard.cgi*.

Contents

Introduction

Schlumberger's innovative e-gate™ USB smart cards combine ISO and Universal Serial Bus (USB) versatility with leading-edge security functionality.

Schlumberger's e-gate technology embeds the USB interface electronics normally found in a smart card reader within the card itself. This feature enables the e-gate USB smart card to simply plug into a USB port on the computer using either a token form factor connector (if the card is used in an innovative cut-down token format) or a desktop form factor connector (in standard smart card format). An e-gate smart card in standard smart card format also works seamlessly with ISO 7816-3 compliant terminals and readers.

Schlumberger e-gate USB smart cards used in e-gate connectors offer plug-and-play and hot pluggable convenience and are self-powered, eliminating the need for external cabling for power connections.

Operating Systems Supported

The e-gate USB smart card drivers were tested on the following platform versions:

- Microsoft Windows 98 (Second Edition)
- Windows Me
- Windows 2000 (Service Pack 4)
- Windows XP Professional (Service Pack 1)

We recommend that you install the specified versions.

Other System Requirements

- **Minimum processing capability** — 133 MHz processor with 32 MB RAM
- **Port** — Available Universal Serial Bus (USB)

Cards Supported

The e-gate connectors are for Schlumberger e-gate USB smart cards only. Inserting other ISO 7816-3 compliant cards in the desktop form factor connector results in no behavior.

Product Specifications and Features

- **Connection** — The desktop form factor connector cable connects to a Type A USB receptacle. The token form factor connector plugs directly into a Type A USB receptacle.
- **Communication speed** — Low speed USB device (1.5 Mbps) using control endpoint 0.

Standards Compliance

- Microsoft PC/SC
- ISO 7816, parts 1-4
- USB, V1.1(include FCC/CE)

Certifications

- FIPS 140-1 Level 2 (Cryptoflex e-gate 32K card)

Installation

Installation of e-gate USB Smart Cards includes three parts:

- Installing the e-gate USB driver software.
- Attaching a Schlumberger e-gate connector (desktop form factor connector or token form factor connector) to the computer.
- Inserting a Schlumberger e-gate USB Smart Card (cut-down token format or standard smart card format) into an e-gate connector. (Note that for the token form factor connector, the cut-down card is inserted into the connector before the connector is attached to the computer.)

The computer must have an available USB series A receptacle.

Expanded information about installing, updating, downgrading, and uninstalling Windows 2000 and Windows XP e-gate USB Smart Card drivers is available from the e-gate USB Technical Support web page (*www.reflexreaders.com/Support/e-gate_ts/e-gate_ts.html*).

See “e-gate Drivers,” on page 5 for information about the driver architecture for e-gate USB Smart Cards.

Installation Notes

The table presents the following information:

- Overview of the installation sequence on each operating system. For detailed instructions, see the sections that follow.
- Summary of the expected behavior of the desktop form factor connector’s power light on each operating system. (There is no power light associated with the token form factor connector.)

Operating System	Installation Notes
Windows 98 / Windows Me	• *Installation sequence:* Install the e-gate USB driver software, reboot, configure the Virtual Reader Enumerator maximum count (*optional*), and then reboot twice if you reset the Virtual Reader Enumerator maximum count. Insert the e-gate USB Smart Card into an e-gate connector that is attached to the computer only after a virtual e-gate USB Smart Card Reader is instantiated by the operating system. • *Power light:* Power light on the desktop form factor connector flickers during I/O activity only.[1]
Windows 2000 / Windows XP	• *Installation sequence:* Install the e-gate USB driver software, configure the Virtual Reader Enumerator maximum count (*optional*), and reboot if you reset the Virtual Reader Enumerator maximum count. Insert the e-gate USB Smart Card into an e-gate connector that is attached to the computer. • *Power light:* Power light on the desktop form factor connector flickers during I/O activity only.[1]

1 The desktop form factor connector's power light also glows steadily at two different points while a card is in the process of being inserted into the connector. (In addition, the power light glows steadily at the same points when the card is being removed from the connector.) This behavior should not be taken as a signal that the card is completely inserted; in fact, the card must be fully inserted and seated in the desktop form factor connector in order to communicate with the computer. When the card is fully inserted, the power light flickers briefly as the computer detects the card.

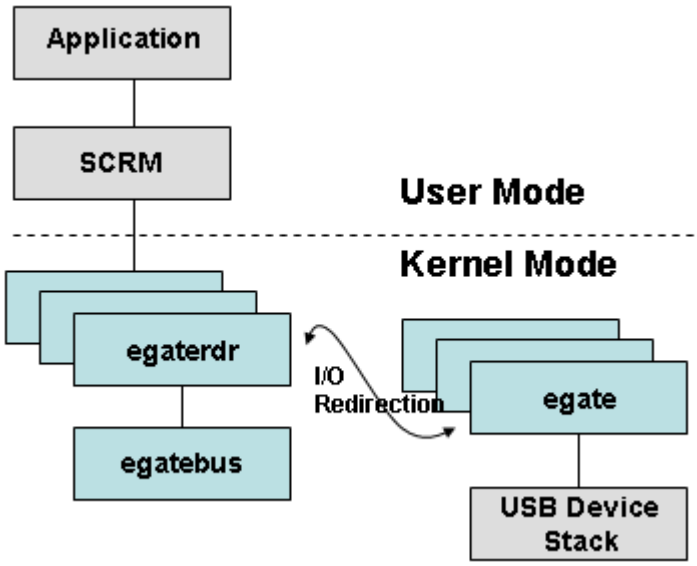
Refer to the release notes for driver version numbers and information about potential installation issues.

Unsigned Driver Warning Messages

A driver is "unsigned" if certification of the driver by Microsoft was pending but not yet complete at the time of release. Depending on driver signing options established by local system security policy (Control Panel > System Properties > Hardware > Driver Signing…), driver installation on Windows 2000 and Windows XP might either silently allow, display a warning message, or block the installation of unsigned drivers. If a warning message is displayed, click **Yes** or **Continue Anyway** to complete the driver installation.

e-gate Drivers

The e-gate USB Smart Cards use a system of interdependent drivers.



- **egatebus.sys**—a root enumerated bus driver that allows creation and support of multiple reader devices.
- **egate.sys**—a low-level USB plug-and-play driver that acts as the functional device driver, enabling e-gate USB Smart Cards in e-gate connectors to interact with the operating system as easily installed, plug-and-play devices. It handles USB enumeration and interface selection, USB protocol translation, power management, and I/O exchange with the underlying USB system drivers. The egate.sys driver is loaded only when the operating system detects that an e-gate USB Smart Card has been connected. It is unloaded when the last e-gate USB Smart Card is removed.
- **egaterdr.sys**—a PC/SC virtual reader driver that represents a PC/SC standard smart card reader interface to the Microsoft-supplied Smart Card Resource Manager. This driver maps the creation/removal of an e-gate USB device to a standard PC/SC card insertion/removal event.

The drivers correspond to three different types of devices in the Device Manager.

The enumerator driver, ***egatebus.sys***, corresponds to a device under the e-gate Virtual Reader Enumerators device type, similar to this:

```
e-gate Virtual Reader Enumerators
   e-gate Virtual Reader Enumerator
```

The e-gate Virtual Reader Enumerator device's property sheet defines the number of virtual PC/SC standard smart card reader devices to create each time the computer is rebooted. The default value is 1, and the number is configurable to a maximum of 10. (Additional e-gate virtual readers also can be created dynamically by simply attaching more e-gate USB Smart Cards to the computer than existing e-gate virtual readers, a feature called *automatic enumeration*. See "Configuring the e-gate Virtual Reader Enumerator," on page 15 for information about using the automatic enumeration feature versus preconfiguring some number of reader devices through the Virtual Reader Enumerator property sheet.)

The e-gate Virtual Reader Enumerator device is present after the computer is rebooted, even if no e-gate USB Smart Cards are attached to the computer.

One or more virtual PC/SC standard smart card reader devices enabled by the ***egatrdr.sys*** driver are listed under the Smart card readers device type as "e-gate USB Smart card reader."

As previously described, the number of smart card reader devices to create each time the computer is rebooted can be configured using the Virtual Reader Enumerator. In addition, if no existing virtual reader device is available when you attach an e-gate USB Smart Card to the computer, a new virtual reader device is dynamically created. Therefore, the number of devices listed under the Smart card readers device type corresponds to the number of preconfigured virtual reader devices plus any dynamically-created virtual reader devices.

By default, one e-gate USB Smart card reader device is configured on the computer, so the Device Manager listing looks like this:

```
Smart card readers
   e-gate USB Smart card reader
```

If three e-gate USB Smart card reader devices exist, the listing looks like this:

```
Smart card readers
   e-gate USB Smart card reader
   e-gate USB Smart card reader
   e-gate USB Smart card reader
```

Virtual reader devices defined by the Virtual Reader Enumerator property sheet are present after reboot. Dynamically-created virtual reader devices persist after reboot only if the number of e-gate USB Smart Cards attached to the computer when the system is rebooted exceeds the number defined in the Virtual Reader Enumerator property sheet.

For each *active* e-gate USB Smart Card (a card is *active* if it has been inserted into an e-gate connector and the system has added it as a device and associated it with a virtual reader), an "e-gate USB Smart Card" device enabled by the ***egate.sys*** driver is listed under the e-gate USB Smart Cards device type, similar to this (the example shows two active e-gate USB Smart Cards):

```
e-gate USB Smart Cards
    e-gate USB Smart Card
    e-gate USB Smart Card
```

The e-gate USB Smart Cards device type displays in the Device Manager only when one or more e-gate USB Smart Cards are inserted. The number of e-gate USB Smart Card devices listed under the e-gate USB Smart Cards device type corresponds to the number of currently active e-gate USB Smart Cards.

NOTE *This discussion is relevant when e-gate USB Smart Cards are used in e-gate connectors; an e-gate card in standard smart card format also works seamlessly with ISO 7816-3 compliant terminals and readers. An e-gate USB Smart Card used in an ISO 7816-3 device is not listed among the e-gate USB Smart Cards devices.*

Installing on Windows 98 or Windows Me

To use an e-gate USB Smart Card on a Windows 98 or Windows Me computer, complete these tasks.

NOTE *The Microsoft Smart Card Base Components must be installed on the computer for the smart card reader to function properly. The Smart Card Base Components are available from the Reflex Readers Downloads website,www.reflexreaders.com/Support/Downloads/downloads.html.*

Complete installation of the e-gate USB driver software (including required reboots) before you attach an e-gate USB Smart Card to the computer.

Step 1: Install the e-gate USB driver software

If the e-gate USB driver software was installed on your computer during installation of the Cyberflex Access Software Development Kit or the Cyberflex Access Integration Kit, you do not need to install additional driver software. If you want to be certain that you have the latest drivers, check the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*).

If the e-gate USB driver software is not installed on your computer, go to the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*) to download the e-gate driver package for Win98/Me. See the package's Install Notes for installation instructions.

Step 2: Reboot the computer

When you reboot, one virtual e-gate USB Smart Card Reader is created on the computer, and displayed messages confirm that the operating system has found the e-gate USB Smart Card Reader device and the driver software that supports it.

Step 3: Attach an e-gate USB Smart Card to the computer

See "Attaching a Connector and Inserting a Card," on page 13 for instructions.

Step 4: (Optional) Attach additional e-gate USB Smart Cards and reboot, or reset the e-gate Virtual Reader Enumerator maximum count value and reboot

If you want to connect to more than one e-gate USB Smart Card concurrently, you can simply attach one or more additional e-gate USB Smart Cards to the computer, and then reboot. The driver system automatically creates a new virtual reader device each time you attach an additional e-gate USB Smart Card to the computer and reboot.

You also have the option to create more than one virtual reader device each time the computer is rebooted, by resetting the Virtual Reader Enumerator maximum count number to a value greater than 1. See “Configuring the e-gate Virtual Reader Enumerator,” on page 15 for instructions about resetting the Virtual Reader Enumerator maximum count value.

If you reset the Virtual Reader Enumerator maximum count value, you must reboot the computer twice on Windows 98 and Windows Me. The second reboot is necessary to work around a limitation of the Microsoft Smart Card Resource Manager.

NOTE *As long as the total number of concurrently connected e-gate USB Smart Cards does not exceed the number of virtual reader devices on the system, a newly-connected e-gate USB Smart Card will be detected and automatically associated with an existing virtual reader device. If, however, the number of concurrently connected e-gate USB Smart Cards exceeds the number of virtual reader devices on the system, the newly-connected card will be detected, but you must reboot the computer in order for the Smart Card Resource Manager to create an additional virtual reader device for the card.*

Refer to the release notes for driver version numbers and information about potential installation issues.

Updating on Windows 98 or Windows Me

If you are updating the e-gate USB driver software (not installing the hardware and software for the first time), complete the tasks listed below.

Step 1: Detach all e-gate connectors from the computer

If you have one or more e-gate connectors attached to the computer, remove them before beginning the e-gate USB driver software update.

Step 2: Install the new e-gate USB driver software

If the new e-gate USB driver software was installed on your computer during installation of the Cyberflex Access Software Development Kit or the Cyberflex Access Integration Kit, you do not need to install additional driver software. If you want to be certain that you have the latest driver, check the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*).

To manually update the e-gate USB driver software on your computer, go to the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*) to download the e-gate driver package for Win98/Me. See the package's Install Notes for installation instructions.

Step 3: Reboot the computer

After the wizard has finished updating the e-gate USB driver software, reboot the computer.

Step 4: Attach an e-gate USB Smart Card to the computer

See "Attaching a Connector and Inserting a Card," on page 13 for instructions.

Refer to the release notes for driver version numbers and information about potential update issues.

Installing on Windows 2000 or Windows XP

To use an e-gate USB Smart Card on Windows 2000 and Windows XP, complete these tasks.

Step 1: Install the e-gate USB driver software

If the e-gate USB driver software was installed on your computer during installation of the Cyberflex Access Software Development Kit or the Cyberflex Access Integration Kit, you do not need to install additional driver software. If you want to be certain that you have the latest drivers, check the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*).

If the e-gate USB driver software is not installed on your computer, go to the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*) to download the e-gate driver package for Win98/Me. See the package's Install Notes for installation instructions.

No reboot is necessary following driver software installation on Windows 2000 or Windows XP.

Step 2: Attach an e-gate USB Smart Card to the computer

See "Attaching a Connector and Inserting a Card," on page 13 for instructions.

Step 3: (Optional) Attach additional e-gate USB Smart Cards, or reset the e-gate Virtual Reader Enumerator maximum count value and reboot

If you want to connect to more than one e-gate USB Smart Card concurrently, you can simply attach additional e-gate USB Smart Cards to the computer. No reboot is necessary. The driver system automatically creates a new virtual reader device each time you attach an additional e-gate USB Smart Card to the computer.

You also have the option to create more than one virtual reader device each time the computer is rebooted, by resetting the Virtual Reader Enumerator maximum count number to a value greater than 1. See "Configuring the e-gate Virtual Reader Enumerator," on page 15 for instructions about resetting the Virtual Reader Enumerator maximum count value.

If you reset the Virtual Reader Enumerator maximum count value, you must reboot the computer.

Additional information about installing, updating, downgrading, and uninstalling Windows 2000 and Windows XP e-gate USB Smart Card drivers is available from the e-gate USB Technical Support web page (*www.reflexreaders.com/Support/e-gate_ts/e-gate_ts.html*).

Refer to the release notes for driver version numbers and information about potential update issues.

Updating on Windows 2000 or Windows XP

Step 1: Attach all e-gate USB Smart Cards

Before beginning the update, ensure that your e-gate USB Smart Card is attached to the computer. If your system is configured for more than one concurrent e-gate USB Smart Card connection, ensure that an e-gate USB Smart Card is attached for each configured connection.

Step 2: Install the new e-gate USB driver software

If the new e-gate USB driver software was installed on your computer during installation of the Cyberflex Access Software Development Kit or the Cyberflex Access Integration Kit, you do not need to install additional driver software. If you want to be certain that you have the latest drivers, check the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*).

To manually update the e-gate USB Smart Card driver software on your system, go to the Reflex Readers Download website (*www.reflexreaders.com/Support/Downloads/downloads.html*) to download the e-gate driver package for Win98/Me. See the package's Install Notes for instructions.

Step 3: Reboot your computer

After installation of the new software is complete, reboot your computer.

Additional information about installing, updating, downgrading, and uninstalling Windows 2000 and Windows XP e-gate USB Smart Card drivers is available from the e-gate USB Technical Support web page (*www.reflexreaders.com/Support/e-gate_ts/e-gate_ts.html*).

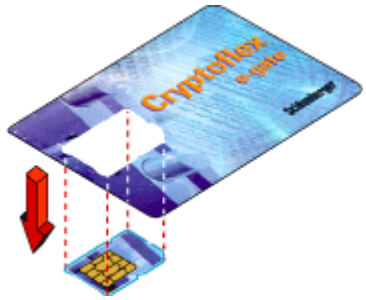
Refer to the release notes for driver version numbers and information about potential update issues.

Attaching a Connector and Inserting a Card

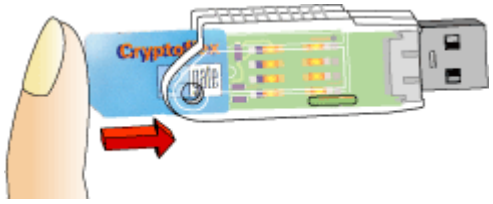
For the desktop form factor connector, simply insert the cable's USB series A connector into an available USB series A receptacle on the computer, and then slide the e-gate USB Smart Card into the connector until it is fully inserted.

For the token form factor connector, follow these instructions:

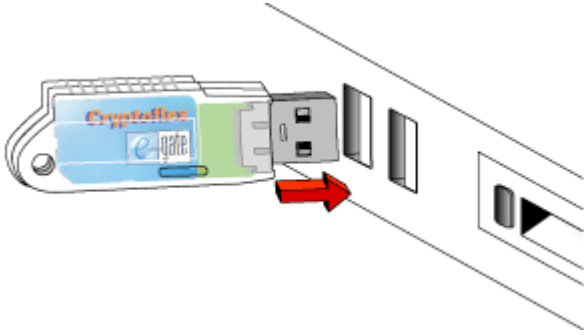
1 Remove the e-gate token from an e-gate USB Smart Card.



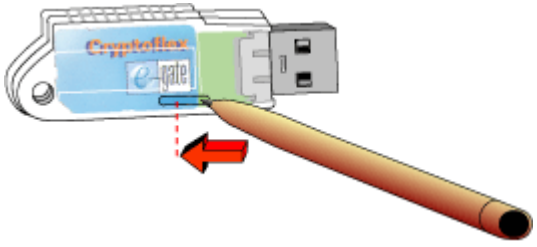
2 Insert the e-gate token in the token form factor connector.



3 Connect the token form factor connector to an available USB series A receptacle on the computer.



NOTE *If you ever need to remove the e-gate token from the token form factor connector, insert the end of a pencil or other similar tool into the slot at the side of the connector; slide the token toward the open end of the connector until you can grasp the token and remove it.*



Configuring the e-gate Virtual Reader Enumerator

In the current e-gate USB driver architecture, if you will be connecting multiple e-gate USB smart cards to the computer, you have the option to simply plug in additional cards and let the system automatically add them as devices and associate them with virtual readers, a feature called *automatic enumeration*. In this scenario, the system goes through a plug-and-play discovery sequence when you plug in an e-gate USB smart card and then adds the new card as a virtual device. (On Windows 98/Me, automatic enumeration also requires a reboot of the computer.) This option offers the advantage of not requiring you to perform any manual configuration tasks associated with adding additional e-gate USB smart cards to the system.

Alternatively, you have the option to configure the system to automatically create some number (to a maximum of ten) of virtual e-gate devices each time you reboot the computer, even if those devices are not attached to the computer at boot time. The advantage of this scenario is that the plug-and-play discovery sequence for the preset number of virtual devices happens at boot time, so when you attach the e-gate connector and plug in the card, there is no post-insertion delay before the card becomes active.

Here are instructions about preconfiguring the number of virtual e-gate devices to create each time the computer is rebooted.

Resetting the Virtual Reader Enumerator Count

The e-gate Virtual Reader Enumerator device's property sheet defines the number of virtual reader interfaces to create when the computer is rebooted.

NOTE *Because each e-gate USB Smart Card requires a separate e-gate connector at the time it is in use, the e-gate Virtual Reader Enumerator maximum count number is usually set to the maximum number of e-gate connectors expected to be attached to the computer at one time.*

These are the steps to configure the number of virtual reader interfaces:

1. Start the Device Manager. For example, on Windows 2000, select **Start** → **Settings** → **Control Panel**. Double-click **System**, click the **Hardware** tab, and then click the **Device Manager** button.
2. In the Device Manager, expand the e-gate Virtual Reader Enumerators device type, and then double-click the **e-gate Virtual Reader Enumerator** device to open its Properties.

3 In the device's Properties, click the **e-gate Readers** tab.

4 Use the size arrows to change the maximum count value from the default, which is 1. The maximum allowable value is 10. After you have selected a value, click **OK**. Close the property sheet and the Device Manager.

5 On all platforms, reboot the computer.

6 On Windows 98 and Windows Me computers, you must reboot a second time. The second reboot is necessary to work around a limitation of the Microsoft Smart Card Resource Manager.

You can change the maximum count value at any time. Each time you change the maximum count value, you must reboot the computer as directed above.

NOTE *Each e-gate USB Smart Card Reader device uses system resources; therefore, we recommend that you configure the maximum count to the number of concurrently active e-gate USB smart cards you anticipate you will need, and no more.*

3 Troubleshooting

This section describes some problems you might encounter when you set up and use an e-gate USB smart card in an e-gate connector, along with possible causes and solutions.

A general discussion about installing, updating, downgrading, and uninstalling e-gate USB smart card drivers is available through the e-gate USB Technical Support web page (*www.reflexreaders.com/Support/e-gate_ts/e-gate_ts.html*)

If you need additional help, use the User Discussion Forums or contact the Schlumberger reader support team through the Reflex Reader Technical Support website (*www.reflexreaders.com/Support/support.html*).

Refer to the release notes packaged with your product for information about other known product issues.

The desktop form factor connector power light is not on

Cause Description: On all platforms, the power light is illuminated only during I/O activity between the computer and the e-gate USB smart card.

NOTE *The desktop form factor connector's power light also glows steadily at two different points while a card is in the process of being inserted into the connector. (In addition, the power light glows steadily at the same points when the card is being removed from the connector.) This behavior should not be taken as a signal that the card is completely inserted; in fact, the card must be fully inserted and seated in the desktop form factor connector in order to communicate with the computer. When the card is fully inserted, the power light flickers briefly as the system detects the card.*

The e-gate connector is not getting power to operate

Cause Description: The connector plug is not inserted securely in the USB port.

Solution: Make sure the connector plug is securely inserted in a USB port on the computer.

The e-gate connector is getting power, but I can't connect to it

No Windows NT 4.0 support

Cause Description: The computer is running Windows NT 4.0, which does not support USB devices, even if the hardware has a USB port.

BIOS Setup

Cause Description: The USB port is disabled in the system BIOS.

Solution: Check the system's Device Manager window. If the USB controller does not appear in the device tree, check the system Basic Input/Output System (BIOS) setting to make sure the USB port is enabled. (For information about your BIOS control system, refer to the documentation for your system.)

Verifying the USB Controller Status

Open the Device Manager (for information about how to open the Device Manager, refer to the documentation for your system) and verify that the USB Controller appears in the device tree. If the USB Controller appears, the BIOS setting is likely to be enabled. If it does not appear, check to make sure the USB Controller is enabled in the BIOS setup.

Windows 98/Me: the Virtual Reader Enumerator counter is not visible

Cause Description: The Virtual Reader Enumerator device property page file was not copied to the expected directory during installation. This is a known, intermittent problem.

Solution: Copy the slbmgp98.dll file in the installation package to the $WINDOWS\System32 directory, and reboot the computer.

Windows 98/Me: I attached a new e-gate USB Smart Card, but the card is not visible to the applications on my system

Cause Description: The automatic enumeration feature could not associate the newly-connected e-gate USB smart card with a virtual reader device because all existing virtual reader devices were associated with other concurrently connected cards.

Solution: Reboot the computer; the Smart Card Resource Manager will create a new virtual reader driver and associate it with the newly-connected e-gate USB smart card.

I changed the Virtual Reader Enumerator count to create more virtual PC/SC standard smart card reader devices at reboot time, but I still see the previously configured number of devices

Cause Description: The system is not finding the new value.

Solution: After resetting the maximum count number in the Virtual Reader Enumerator property sheet, reboot the system on all platforms. On Windows 98 or Windows Me, reboot a second time.

Version information for e-gate drivers following upgrade is inconsistent

Cause Description: The file version number displayed in the Driver File Details dialog correctly describes the current driver. The Driver Version information displayed (on some platforms) in the Driver tab is not reliable.

Solution: On all platforms, follow these steps to accurately identify driver version number information:

1. Start the Device Manager. For example, to start the Device Manager on Windows 2000, select **Start** → **Settings** → **Control Panel**. Double-click **System**, click the **Hardware** tab, and then click the **Device Manager** button. (For help starting the Device Manager on other platforms, refer to the operating system's Help.)
2. In the Device Manager, expand the device type that includes the e-gate USB smart card driver whose driver version number you want to check, and then double-click the name of the device to open its Properties. For

example, to check the version number of the e-gate USB Smart Card Reader driver, expand the Smart card reader device type, and then double-click **e-gate USB Smart Card Reader**.

3 In the device's Properties, click the **Driver** tab, and then click the **Driver Details...** button.

The file version number displayed in the Driver File Details dialog correctly describes the current driver.

Windows 2000/XP: Driver installation or update did not produce the expected results

Solution: Additional information about installing, updating, downgrading, and uninstalling Windows 2000 and Windows XP e-gate USB smart card drivers is available from the e-gate USB Technical Support web page (*www.reflexreaders.com/Support/e-gate_ts/e-gate_ts.html*).

Index

O

P

R

S

T

U

V

W