

SAGEM SA

MorphoSmart™ Installation Guide



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1 Overview

1.1 Welcome to SAGEM SA MorphoSmart™

Congratulations for choosing the MorphoSmart™ Automatic Fingerprint Recognition Terminal. MorphoSmart™ provides an innovative and effective solution for applications using Fingerprint Verification or/and Identification.

Among the many biometric sciences, the use of finger imaging has significant advantages. Each finger is a unique physical signature developed before birth and is preserved until death.

The MorphoSmart™ terminal integrates SAGEM image processing and features matching algorithms (MorphoSoft™ and MorphoImaging™). This technology is based on lessons learned during 18 years of experience in the field of biometric identification and the processing of literally millions of individual fingerprint identification records.

We believe you will find the MorphoSmart™ fast, accurate, and easy to use as a biometric peripheral.

The MorphoSmart™ offers the following advantages:

High quality optical scanner,

Software development suite (MorphoSoft) with MorphoSmart™ MSO100,

Software development suite (MorphoSmart™ SDK) with MorphoSmart™ MSO200, MorphoSmart™ MSO300, MorphoSmart™ CBM and Secure MorphoSmart™,

Key Management System (MorphoSmart™ KMS) with Secure MorphoSmart™,

PC/SC Smart Card Reader (only available with MorphoSmart™ MSO350),

Compact size for easy installation and integration into your available office space,

Intuitive interface that is easy to use in both setup and operational modes.

To ensure the most effective use of your SAGEM SA MorphoSmart™, we recommend that you read this Installation Guide entirely.

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1.2 Product Overview

MorphoSmart™ 100 Products		Part Numbers
MorphoKit™Verif	(MSO100+dongle parallel +CD)	251212341
MorphoKit™Ident	(MSO100+ dongle parallel +CD)	251208496
MorphoKit™Verif	(MSO100+dongle USB+CD)	251783390
MorphoKit™Ident	(MSO100+ dongle USB+CD)	251783379
MorphoKit™Verif OEM	(MSO100-OEM+ dongle+CD)	251212359
MorphoKit™Ident OEM	(MSO100-OEM+ dongle+CD)	251208508
MorphoKit™CD Upgrade	(CD-ROM)	296224287
MSO100		251156085
MSO100 OEM		251156043

MorphoSmart™ 200 Products		Part Numbers
MSO200 US	(MSO200 United State)	251204844
MSO200 EU	(MSO200 Europe)	251156001
MSO200-OEM	(MSO200-OEM)	251155715

MorphoSmart™ 300 Products		Part Numbers
MSO300		251284003
MSO300 OEM		251741496
MSO350		251540641

MorphoSmart™ CBM Products		Part Numbers
MSO 1300		251827952
Module 2G CBM		251730609

MorphoSmart™ Licence Products		Part Numbers
MSO3xx S License		251425782
IDENTLITE License		251665469

MorphoSmart™ SDK Products		Part Numbers
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MorphSmart™ SDK (CD-ROM) 251208475

MorphoSmart™ KMS Products Part Numbers

MorphSmart™ KMS (CD-ROM) 251363289

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1.3 Safety instructions

Before plugging your MorphoSmart™ into a power source, check that the power source to which you intend to connect it complies with the voltage, current and frequency specifications on the rating label of the power supply unit (depending on model).

If you are using the MorphoSmart™ MSO200, only use the power supply unit provided with your MorphoSmart™. Do not use any other power supply.

The MSO terminal does not have an on/off switch and can only be powered on and off by unplugging it from the power source. For this reason the MSO should be connected to an outlet that is readily accessible.

The MorphoSmart™ is intended for indoor use.

The terminal complies with both European and U.S. standards as follows:

Europe: SAGEM SA hereby declares that the SAGEM SA MorphoSmart™ has been tested and found compliant with the below listed standards as required by the EMC Directive 89/336/EEC: EN55022 (1994) / EN55024 (1998) and by the low voltage Directive 73/23/EEC amended by 93/68/EEC: EN60950 (2000).

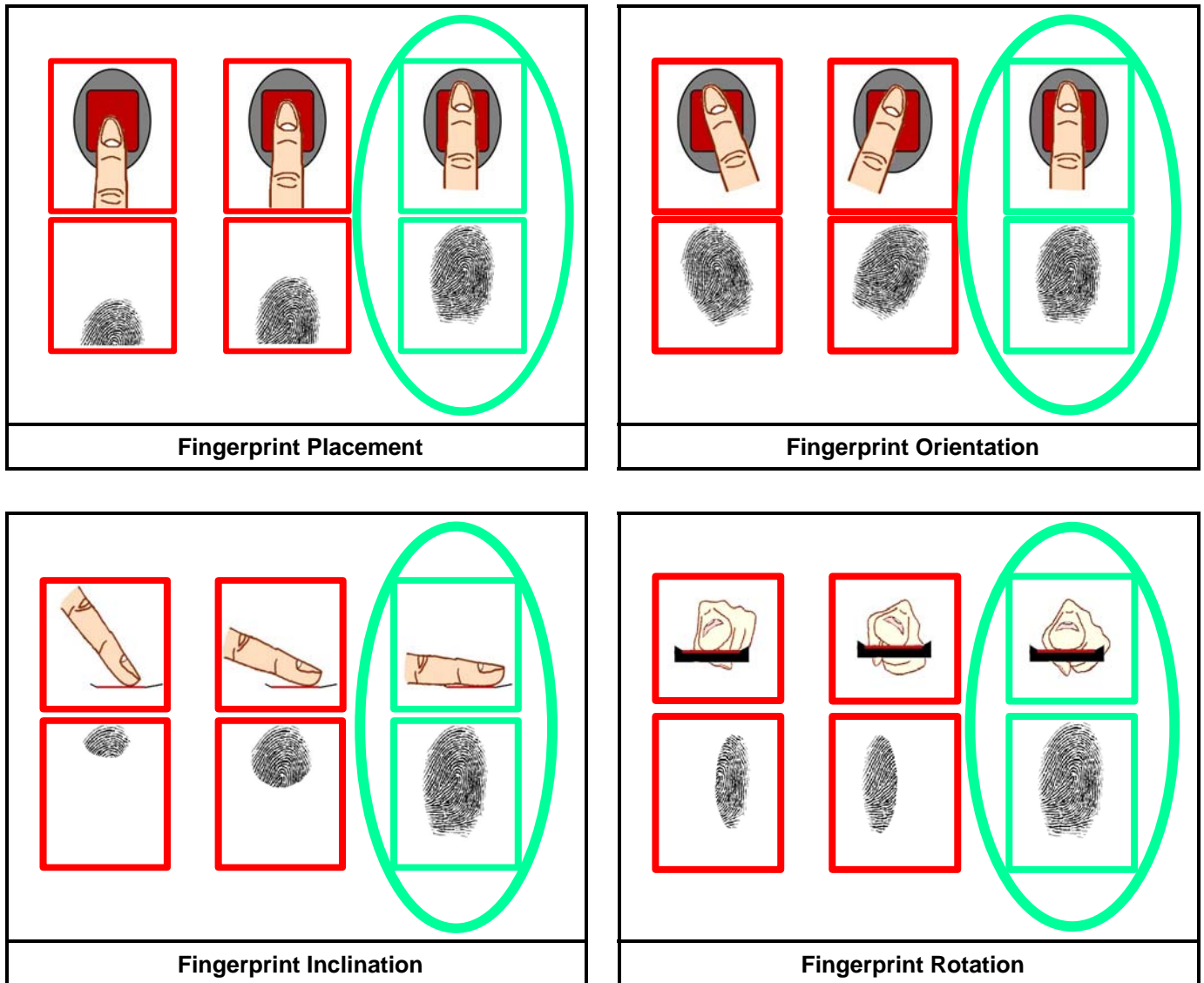
USA: This equipment has been tested and found compliant with FCC part 15 Class B digital device requirements. These requirements are designed to ensure reasonable protection against harmful RF interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy. If the MSO is not installed and used in accordance with the included instructions it may interfere with radio communications. If the MSO interferes with radio or television reception - which can be determined by disconnecting and re-connecting the unit - the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

1.4 Finger Placement Rules

MorphoSmart™ biometric performance is increased if finger is correctly positioned.

Common non-optimal finger positioning is illustrated below, followed by an illustration of correct finger placement.

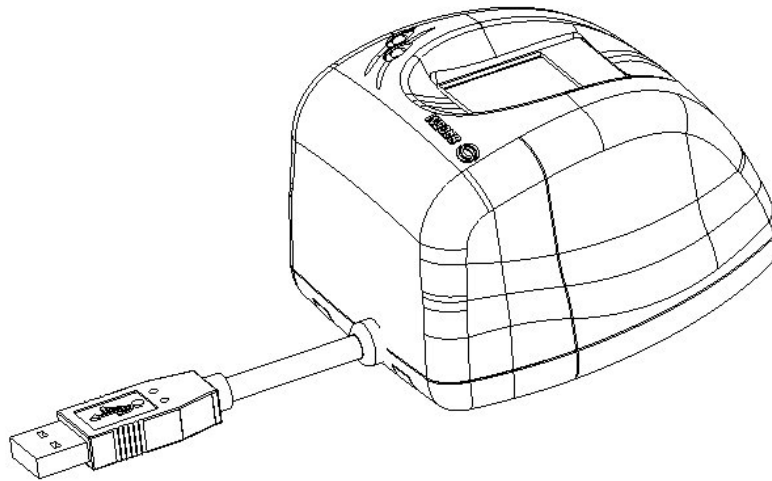


Other recommendations for acquiring a quality finger image:

- Fingers should neither be too moist nor extremely dry,
- Exert firm, but not excessive, finger pressure on the surface of the sensor,
- Once a finger is placed on the scanner keep the finger still until advised to move or remove the finger from the scanner.

2 MorphoSmart™ MSO100

2.1 Physical Characteristics



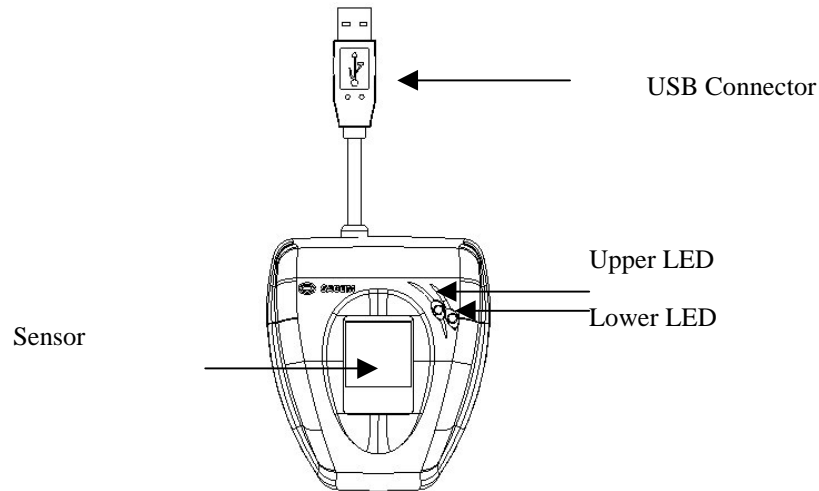
2.2 Installation

Installing the MorphoSmart™ MSO100 is very simple. It requires only an available USB port on the PC.

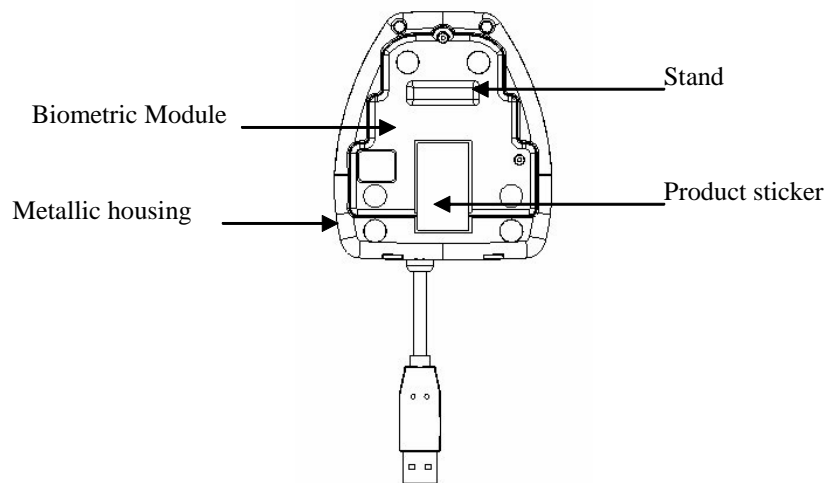
Set the MorphoSmart™ terminal on a flat clear surface where it will not be at risk of coming in contact with fluids.

2.3 General description

Top view



Bottom view



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2.4 Man Machine Interface

There are two LEDs to guide the use of the MorphoSmart™ MSO100. The table below defines the various combinations of LEDs and colors that provide device status to the user.

STATUS	SENSOR	LOWER LED	UPPER LED
Suspend	Off	Off	Off
Stand By	Off	Flashing Green	Not used
Image Acquisition	On	Blinking Green	Not used
Failure	Off	2 seconds in Red	Not used
Maintenance State	Off	Blinking Red	Blinking Red
Unrecoverable Error / USB Not Initialized	Off	Red	Red

Table 1: MSO100 status

NOTE: Both LEDs will be red up on successful power-up until the USB device is initialized.

2.5 Getting started

To use the MorphoSmart™ MSO100 you must install the MorphoKit™ software delivered with your MorphoSmart™.

MorphoSmart™ MSO100 USB driver setup

Run the *Setup.exe* file in the *MSO100MSO100 USB Driver* directory on the MorphoKit™ CD-ROM.

Plug the MSO100 device to a USB port on your PC

Important Notice

MorphoSmart™ MSO USB devices are currently supported under Windows 2000 SP4, Windows XP Professional Edition SP2, and Windows Server 2003 Enterprise.

You need to have administrator rights on your local computer when plugging the MorphoSmart™ MSO device for the first time.

If you do not have an unused USB port you may need to purchase and install a self-powered USB hub in order to use your MorphoSmart™ USB device.

For more information on the installation, please refer to the [readmeMSO.chm](#) help file at the MorphoKit™ CD-ROM root.

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2.6 MorphoSmart™ MSO100 Technical Characteristics

Sensor

- 500 DPI in X and Y axis
- 8-bit gray scale
- Image resolution 4 lppm for contrast > 25%
- Acquisition area 21 x 21 mm

USB

- USB 1.1

Power

- 5V, 500mA

Temperature range

- Operating +0°C to 40°C
- Storage -20°C to °70°C

Humidity

- Operating 10% < RH < 80% non-condensing
- Storage < 95%

Weight

- 300g

Dimensions

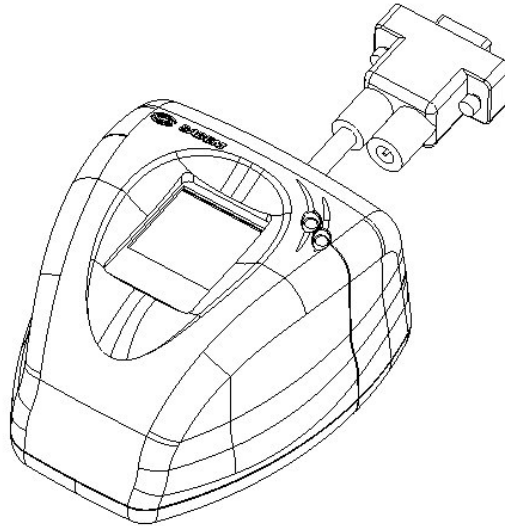
- 80 x 92 x 57mm

2.7 MorphoSmart™ MSO100 Hardware Platform Compatibility

Experience with the MSO100 to date has determined that it does not perform optimally on some PC hardware configurations. We therefore strongly advise you to test your MSO100 on your target PC hardware configuration before deploying the product.

3 MorphoSmart™ MSO200

3.1 Physical Characteristics



3.2 Safety instructions

The terminal is powered on and off by plugging and unplugging the power supply cord. The main power outlet must be located within a maximum of 8 feet of the terminal and should be easily accessible.

3.3 Installation

Installing MorphoSmart™ is a very simple process. It requires a suitable environment and connecting the necessary power and data cables.

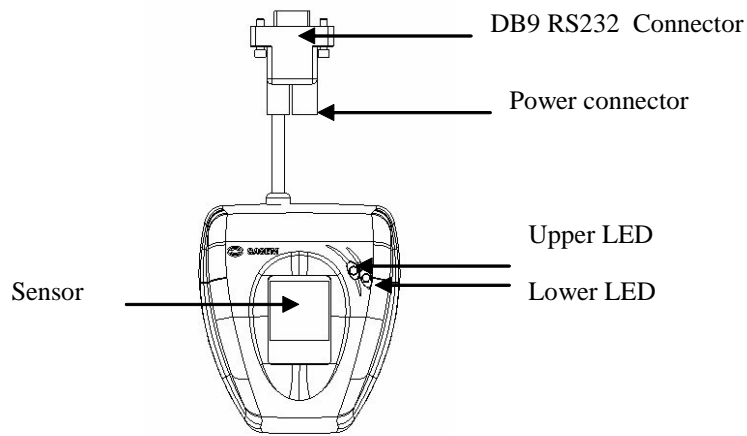
Position the MorphoSmart™ terminal on a flat clear surface where it will not be at risk of coming in contact with fluids.

Connect the power supply connector to the socket on top of the RS232 connector. Connect the RS232 connector to the PC.

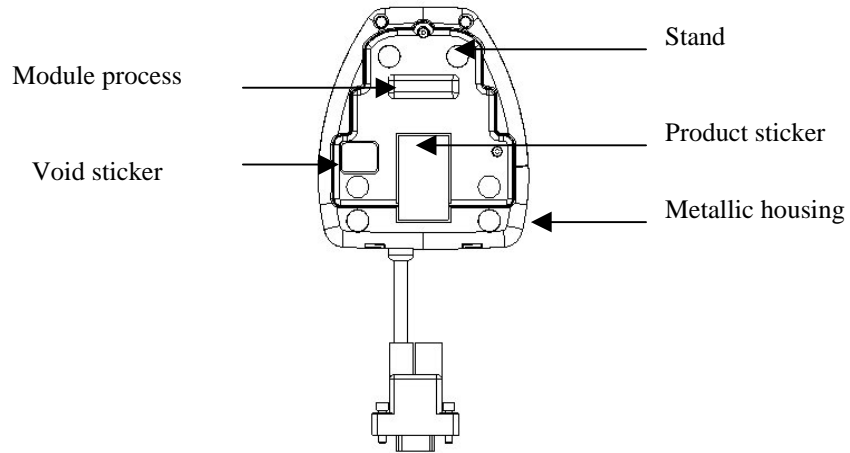
NOTE: Only use the provided power supply.

3.4 General Description

Top view



Bottom view



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3.5 Man Machine Interface

There are two LEDs to help use the MSO200. The table below lists the functional status of the LEDs during operation.

Note that the sensor is on only when acquisition is performed. Except during enrollment, it means that the user is invited to put their finger on the sensor.

STATUS	SENSOR	LOWER LED	UPPER LED
Stand By	Off	Flashing Green	Not used
Waiting For Finger	On	Off	Not used
Waiting For Finger Removal	On	Green	Not used
Finger Misplaced Or Latent	On	Blinking Red	Not used
Switch To Next Finger	On	Blinking Green	Not used
Recognized Finger	Off	2 seconds in Green	Not used
Finger Unknown / Failure	Off	2 seconds in Red	Not used
Maintenance State or Personalization State (secure MSO)	Off	Blinking Red	Blinking Red
Unrecoverable Error	Off	Red	Red

Table 2: MSO200 status

3.6 Getting Started

To use the MorphoSmart™ MSO200 you must install the MorphoSmart™ Software Development Kit delivered with your MorphoSmart™.

MorphoSmart™ SDK setup

To install the MorphoSmart™ SDK, insert the MorphoSmart SDK CD-ROM into the drive.

Double click on the Setup.exe file to start MorphoSmart™ SDK installation

Use the Next and Back buttons to navigate through the wizard.

Important Notice

The MorphoSmart™ MSO200 can be either connected with Windows™ platforms using dedicated DLLs or with any type of host using a simple protocol working over a RS.232 link.

For more information on the RS232 protocol, please refer to the [MorphoSmart Host System Interface specification](#).

For more information on the MorphoSmart™ Software Development Kit, please refer to the [MorphoSmart Programmer Guide](#).

Both documents are installed with the MorphoSmart™ SDK setup.

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3.7 MSO200 Technical Characteristics

Performance

- Verification: one to one in less than 1 second
- Identification: one to 2000 persons (2 fingers) in 2 seconds
- Internal record storage:
 - 100 2-finger records
 - 2000 2-finger records with IDENTLITE license.

Input / Output

- RS232 up to 115 200 bps

Power

- 5V, 500mA

Temperature range

- Operating +0°C to 40°C
- Storage -20°C to °70°C

Humidity

- Operating 10% < RH < 80% non-condensing
- Storage < 95%

Weight

- 300g

Dimensions

- 80 x 92 x 57mm

4 MorphoSmart™ MSO3xx

4.1 Physical Characteristics

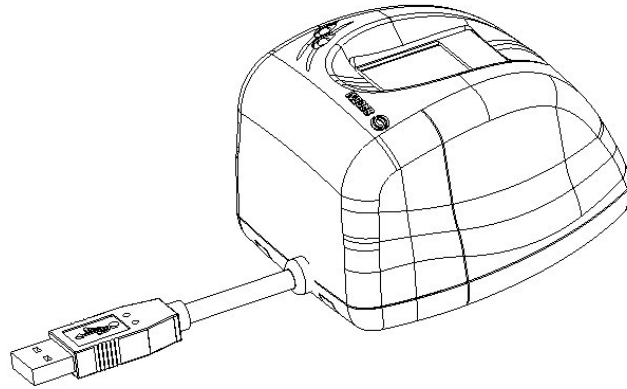


Figure 1: MorphoSmart™ MSO300

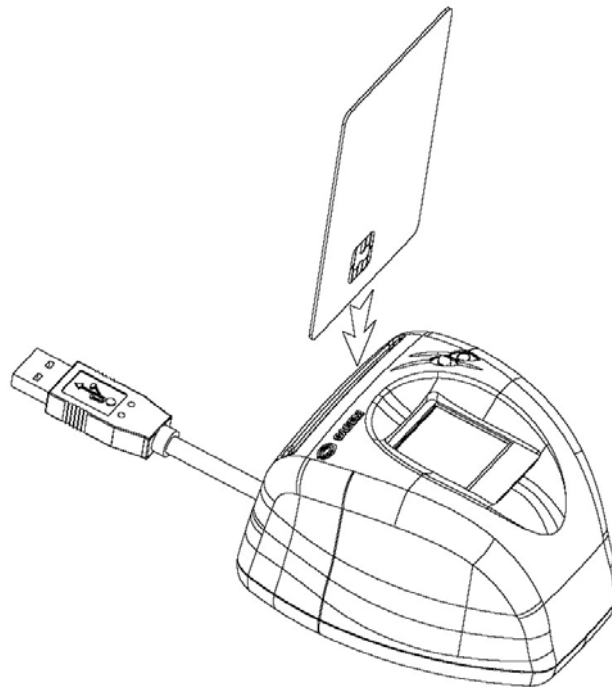


Figure 2: MorphoSmart™ MSO350

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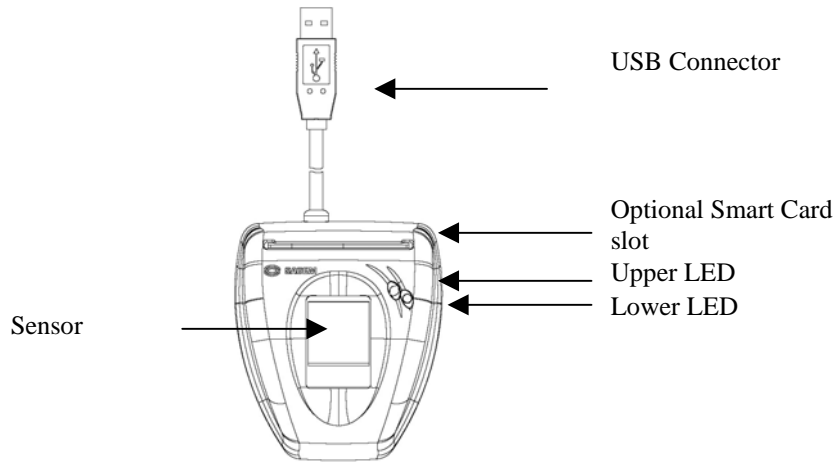
4.2 Installation

Installing the MorphoSmart™ MSO3xx is very simple. It requires only an available USB port on the PC.

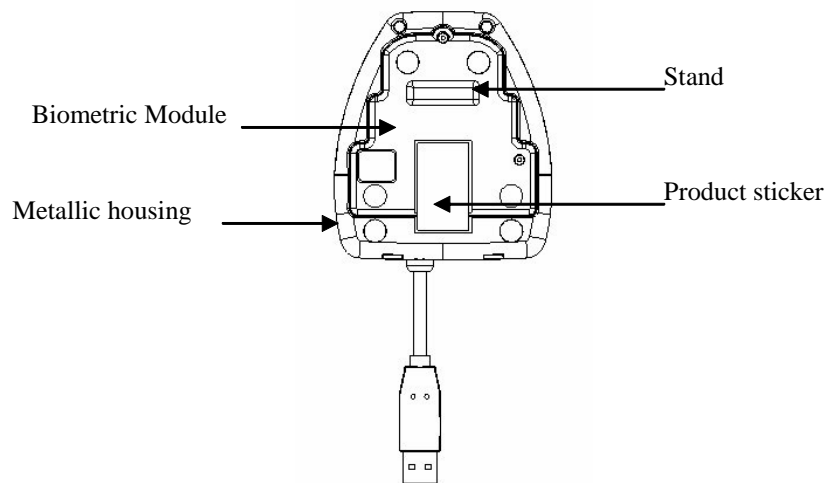
Set the MorphoSmart™ terminal on a flat clear surface where it will not be at risk of coming in contact with fluids.

4.3 General description

Top view



Bottom view



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4.4 Man Machine Interface

There are two LEDs to help use the MSO3xx. The table below lists the functional status of the LEDs during operation.

Note that:

- the sensor is on only when acquisition is performed. Except during enrollment, it means that the user is invited to put their finger on the sensor,
- the upper led is reserved to notify smart card request status,
- the lower led is reserved to notify biometric request status.

4.4.1 System status

STATUS	SENSOR	LOWER LED	UPPER LED
Suspend	Off	Off	Off
Stand By	Off	Flashing Green	See Table 5
Maintenance State or Personalization State (secure MSO)	Off	Blinking Red	Blinking Red
Unrecoverable Error or USB enumeration Error	Off	Red	Red

Table 3: MSO3xx system status

NOTE: Both LEDs will be red upon successful power-up until the USB device is initialized.

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4.4.2 Biometric request status

STATUS	SENSOR	LOWER LED	UPPER LED
Waiting For Finger	On	Off	See Table 5
Waiting For Finger Removal	On	Green	See Table 5
Finger Misplaced Or Latent	On	Blinking Red	See Table 5
Switch To Next Finger	On	Blinking Green	See Table 5
Recognized Finger	Off	2 seconds in Green	See Table 5
Finger Unknown / Failure	Off	2 seconds in Red	See Table 5

Table 4: MSO3xx biometric request status

4.4.3 Smart card request status

Smart card request status is only manage by the upper led.

STATUS	SENSOR	LOWER LED	UPPER LED
Smart Card powered on	See Table 4	See Table 4	Green
Smart Card powered off	See Table 4	See Table 4	Off
Smart Card treatment in progress	See Table 4	See Table 4	Blinking Green

Table 5: MSO3xx smart card request status

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4.5 Getting started

To use the MorphoSmart™ MSO3xx you must install the MorphoSmart™ Software Development Kit delivered with your MorphoSmart™.

MorphoSmart™ SDK setup

To install the MorphoSmart™ SDK, insert the MorphoSmart™ SDK CD-ROM into the drive.

Double click on the Setup.exe file to start MorphoSmart™ SDK installation

Use the Next and Back buttons to navigate through the wizard.

MorphoSmart™ MSO3xx USB driver setup

The MorphoSmart™ SDK must be installed prior to the USB driver installation.

Start the MORPHOSMART™ MSO30xx USB driver installation from the MorphoSmart™ SDK PROGRAMS folders in the windows start menu:

START / PROGRAMS / MorphoSmart SDK / Drivers / Install (Desinstall) the USB driver for MorphoSmart

Use the Next and Back buttons to navigate through the wizard.

Plug the MSO3xx device to an available USB port on your PC

Important Notice

MorphoSmart™ MSO USB devices are currently supported under Windows 2000 SP4, Windows XP Professional Edition SP1 and Windows Server 2003 Enterprise.

You need to have administrator rights on your local computer when plugging the MorphoSmart™ MSO device for the first time.

If you do not have an unused USB port you may need to purchase and install a self-powered USB hub in order to use your MorphoSmart™ USB device.

For more information on the MorphoSmart™ Software Development Kit, please refer to the [MorphoSmart Programmer Guide](#).

4.6 MorphoSmart™ MSO3xx Technical Characteristics

Performance

- Verification: one to one in less than 1 second
- Identification: one to 2000 persons (2 fingers) in 2 seconds
- Internal record storage:
 - 100 2-finger records
 - 2000 2-finger records with IDENTLITE license.

USB

- USB 1.1

Smart Card

- PC/SC
- ISO 7816 1-4

Power

- 5V, 500mA

Temperature range

- Operating +0°C to 40°C
- Storage -20°C to 70°C

Humidity

- Operating 10% < RH < 80% non-condensing
- Storage < 95%

Weight

- 300g

Dimensions

- 80 x 92 x 57mm

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4.7 MorphoSmart™ MSO3xx Hardware Platform Compatibility

Experience with the MorphoSmart™ MSO300 to date has determined that it does not perform optimally on some PC hardware configurations. We therefore strongly advise you to test your MSO300 on your target PC hardware configuration before deploying the product.

5 The MorphoSmart™ Compact Biometric Module

5.1 Physical Characteristics

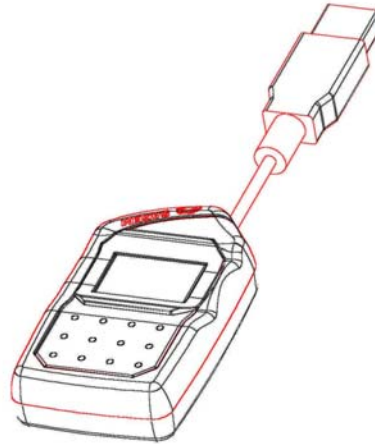


Figure 3: MorphoSmart™ Compact Biometric Module

5.2 Installation

Installing the MorphoSmart™ Compact Biometric Module (CBM) is very simple. It requires only an available USB port the PC.

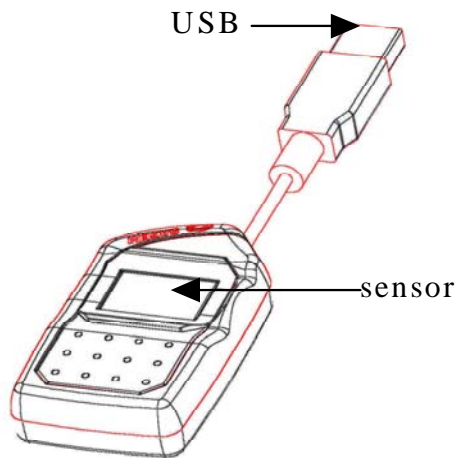
It can be interfaced also with a serial link (Open Collector). The series interface is composed of TX, RX and GND.

Set the MorphoSmart™ CBM terminal on a flat clear surface where it will not be at risk of coming in contact with fluids.

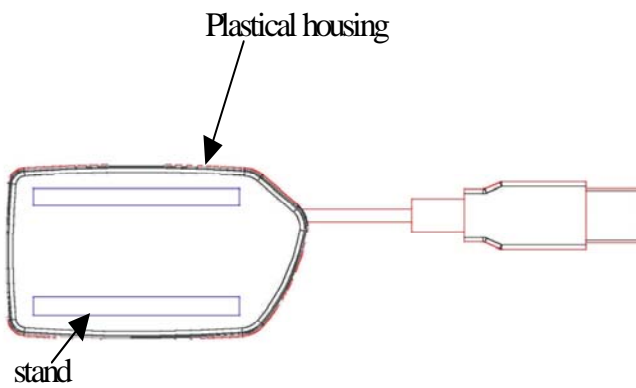
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5.3 General description

Top view



Bottom view



5.4 Man Machine Interface

5.4.1 System status

STATUS	SENSOR
Suspend	Off
Stand By	Off
Maintenance State or Personalization State (secure MSO)	Off
Unrecoverable Error or USB enumeration Error	Off

Table 6: CBM system status

5.4.2 Biometric request status

STATUS	SENSOR
Waiting For Finger	On
Waiting For Finger Removal	On
Finger Misplaced Or Latent	On
Switch To Next Finger	On
Recognized Finger	Off
Finger Unknown / Failure	Off

Table 7: CBM biometric request status

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5.5 Getting started

To use the MorphoSmart™ CBM you must install the MorphoSmart™ Software Development Kit delivered with your MorphoSmart™.

MorphoSmart™ SDK setup

To install the MorphoSmart™ SDK, insert the MorphoSmart™ SDK CD-ROM into the drive.

Double click on the Setup.exe file to start MorphoSmart™ SDK installation

Use the Next and Back buttons to navigate through the wizard.

MorphoSmart™ CBM USB driver setup

The MorphoSmart™ SDK must be installed prior to the USB driver installation.

Start the MORPHOSMART™ CBM USB driver installation from the MorphoSmart™ SDK PROGRAMS folders in the windows start menu:

START / PROGRAMS / MorphoSmart SDK / Drivers / Install (Desinstall) the USB driver for MorphoSmart

Use the Next and Back buttons to navigate through the wizard.

Plug the MORPHOSMART™ CBM device to an available USB port on your PC

Important Notice

MorphoSmart™ CBM USB devices are currently supported under Windows 2000 SP4, Windows XP Professional Edition SP2 and Windows Server 2003 Enterprise.

You need to have administrator rights on your local computer when plugging the MorphoSmart™ CBM device for the first time.

If you do not have an unused USB port you may need to purchase and install a self-powered USB hub in order to use your MorphoSmart™ USB device.

For more information on the MorphoSmart™ Software Development Kit, please refer to the [MorphoSmart Programmer Guide](#).

5.6 MorphoSmart™ CBM Technical Characteristics

Performance

- Verification: one to one in 1.2 second
- Identification: one to 500 persons (2 fingers) in 1.5 second
- Internal record storage: 500 2-finger records

USB

- USB compliant

Serial Interface

- The serial interface is composed of TX,RX and GND. The level will be of open collector type.
- The transmission is up to 115.200 bauds for a 1 meter maximum length.
- The product integrator will have to anticipate an interface with its product for a level adaptability

Power

- 3 V to 5.5V
- Standby mode: 500 μ A (Typical)
- System Idle: 50 mA (Typical)
- Full operating sensor on: 200mA (max)
- Boot time 0.8 second

Temperature range

- Operating 10°C to 50°C
- Storage -20°C to 70°C

Humidity

- Relative Humidity: 85% RH

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Weight

- 20g

Dimensions

- 53.7 x 33.7 x 13.5mm

6 Secure MorphoSmart™ MSO3xx and CBM getting started

In addition to normal installation process, the secure MORPHOSMART™ device must be unlocked and personalized. To perform this, the security information provided with the batch of secure MORPHOSMART™ devices are required: two transport files (usually send by email), and their corresponding password (usually send under secure cover).

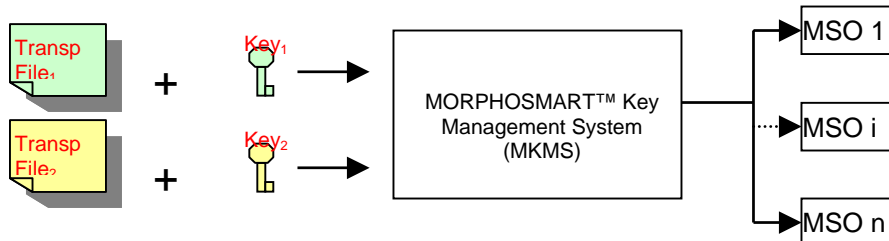


Figure 1: MORPHOSMART™ S unlocking

Insert the **MKMS** CD into your CDROM drive. If installation does not start automatically, run setup.exe from the root directory of the CD.

After installation, start the DAO 3.6 driver installation from the PROGRAMS folders:

[START / PROGRAMS / MorphoSmartKeyManagementSystem / InstallDAO 3.6 /](#)

After installation, start the **MKMS application** from the PROGRAMS folders:

[START / PROGRAMS / MorphoSmartKeyManagementSystem / Exe /](#)

Select the '**Root key generation**' action in the '**Initialization**' menu, to create your MORPHOSMART™ Certification Authority.

Click '**Insert Transport Files**' button to import the two transport files and their passwords into the **MKMS** database (figure 1).

Set up the value of the **security configuration parameters** and of the **key parameters** ('**Initialization**' menu).

Then connect a new MORPHOSMART™ device to the PC, and use the '**MSO Personalization**' button to unlock it, and to put it in operational condition.

Perform the previous action for each new secure MORPHOSMART™ device of the batch.

For more information about the secure MORPHOSMART™ , please refer to the **MorphoSmartKeyManagementSystem.pdf** file from the PROGRAMS folders:

[START / PROGRAMS / MORPHOSMART™KeyManagementSystem / Documentation /](#)

7 Recommendations

Areas containing combustibles

It is strongly recommended that you do not install your SAGEM SA **MorphoSmart™** in the vicinity of gas stations, petroleum processing facilities or any other facility containing flammable or combustible gasses or materials.

General precautions

Do not attempt to repair your SAGEM SA **MorphoSmart™** yourself. The manufacturer cannot be held responsible for any damage/accident that may result from attempts to repair components.

Any work carried out by non-authorized personnel will invalidate your warranty.

Do not use your SAGEM SA **MorphoSmart™** in damp areas (ex: swimming pools etc). It must be protected from water and other liquids.

Do not expose your SAGEM SA **MorphoSmart™** to extreme temperatures.

Attempts to integrate the **MorphoSmart™** with unapproved accessories will void your warranty.

Due to electrostatic discharge, and depending on the environment, synthetic carpet should be avoided in areas where the SAGEM SA **MorphoSmart™** has been installed.

Warning

The manufacturer cannot be held responsible if the above recommendations are not followed or if the SAGEM SA **MorphoSmart™** is used incorrectly.