# SAGEM SA
# MorphoAccess™ 200/300


## Installation Guide

SAGEM

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***SAGEM MORPHO, Inc.***
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# Welcome to MorphoAccess™

Congratulations for choosing the MorphoAccess™ Automatic Fingerprint Recognition Terminal. MorphoAccess™ provides an innovative and effective solution for access control or time and attendance applications using fingerprint verification and/or identification.

Among a range of alternative biometric techniques, the use of finger imaging has significant advantages: each finger constitutes an unalterable physical signature which develops before birth and is preserved until death. Unlike DNA, a finger image is unique to each individual - even identical twins.

The MorphoAccess™ terminal integrates SAGEM image processing and feature 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 creation of literally millions of individual fingerprint identification records.

We believe that you will find the MorphoAccess™ fast, accurate, easy to use and suitable for physical access control or time and attendance.

The MorphoAccess™ offers the following features:

- High quality optical scanner
- Supports multiple input/output interfaces used in the physical access control industry
- Local area network interface for easy interaction with other host systems
- 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
- Extensive, flexible flash memory for data storage (user data, biometric templates, etc.)

To ensure the most effective use of your MorphoAccess™, please read this Installation Guide in full.

## Safety instructions – Please Read Before Installation

**WARNING:** Installation must be performed by professional installers

**Note:** These instructions for the installation of the MorphoAccess assume the installer is properly qualified as a professional, and is familiar with applicable industry standards, local building/zoning codes, and proper installation practices. Installation should not be attempted by non-professionals.

You are required to use an NEC class II power supply at 12 V ± 5% and 2.5 A minimum.

This product is intended to be installed in accordance with the NEC Class 2 requirements; or supplied by a listed external Power Unit marked Class 2, Limited Power source, or LPS and rated 12 V DC, 2.5 A minimum.

**Europe**: SAGEM SA hereby declares that the SAGEM SA MorphoAccess™ 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).

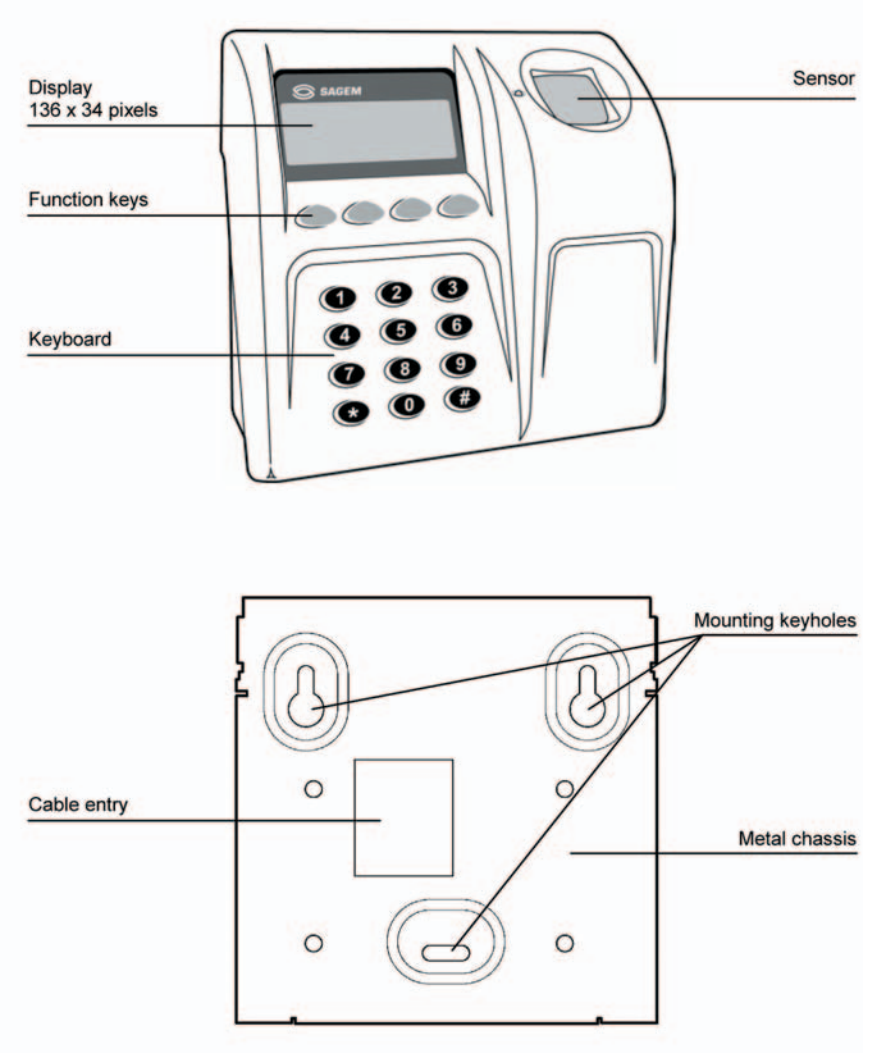
**USA**: This equipment has been tested and found compliant with Class B digital device requirements, pursuant to part 15 of the FCC Rules. These requirements are designed to ensure reasonable protection against harmful RF interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may interfere with radio communications. If this equipment 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

**CAUTION**
**DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED.**
**REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER.**
**MUST BE DISPOSED OF PROPERLY.**

**ATTENTION**
**IL Y A DANGER D'EXPLOSION S'IL Y A REMPLACEMENT INCORRECT DE LA BATTERIE.**
**REMPLACER UNIQUEMENT AVEC UNE BATTERIE DU MEME TYPE OU D'UN TYPE EQUIVALENT RECOMMANDE PAR LE CONSTRUCTEUR.**
**ELIMINER DE FAÇON APPROPRIÉE**

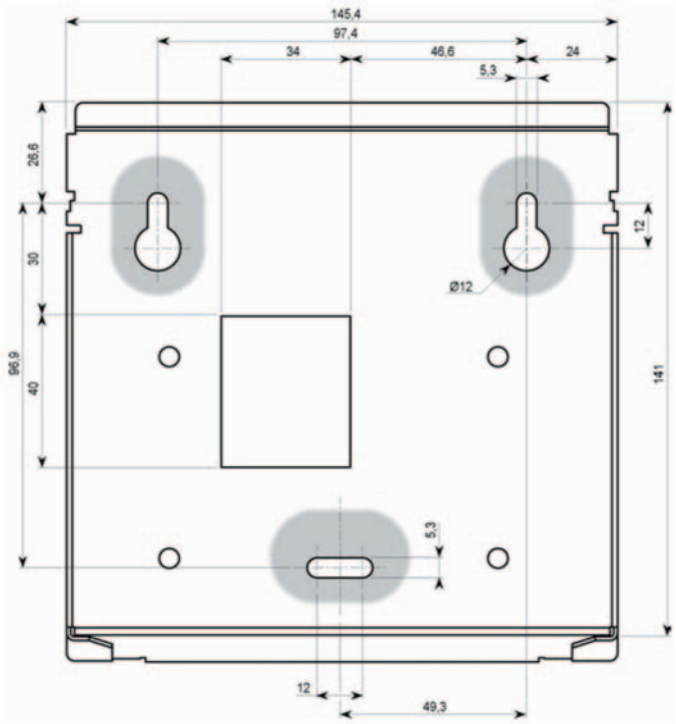
# General description



# Installation procedure

## Stage 1: Drilling the mounting holes for the metal chassis assembly

Mounting and cable entry hole location (rear view)

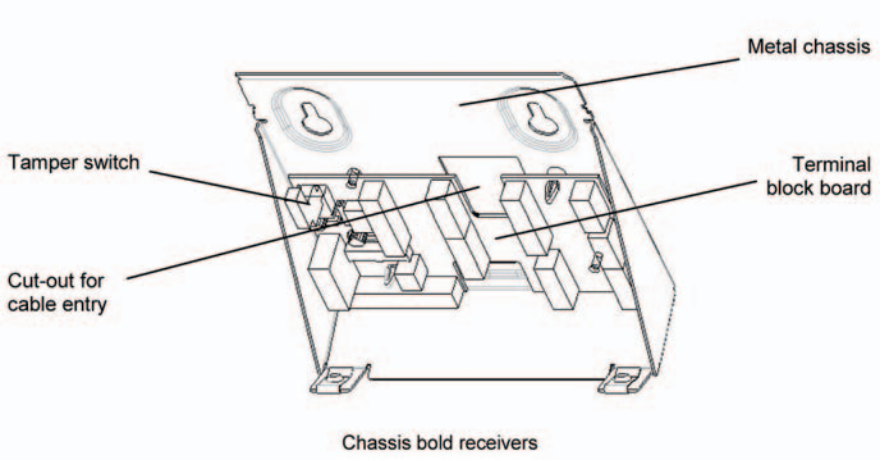



**Note:** The mounting screws can not exceed 5 mm in diameter.

1) Drill the two holes for the screws for the mounting keyholes so that the cable entry is in a suitable position for your cabling. Use the drawing above or (see the Drilling Template section).

2) Drill the hole for the third screw in the center of the slot so that it is possible to correct the position later, if necessary.

## Stage 2: Mounting the metal chassis assembly




1) Disconnect the ribbon cable between the motherboard and the terminal block board so that the assembly shown above can be detached from the rest of MorphoAccess™.

2) Pass the connecting cables through the cable entry.

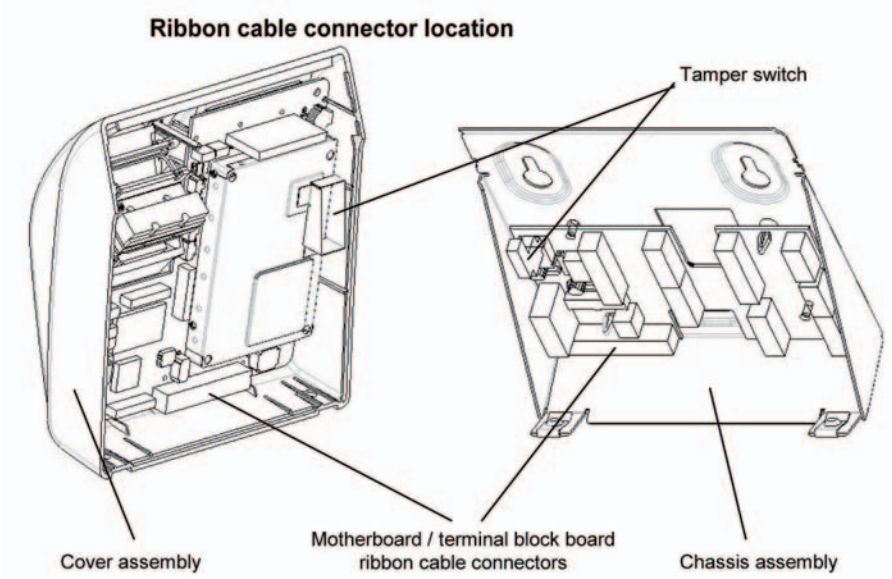
3) Position the chassis assembly against the mounting surface using the two screws in the mounting keyholes.

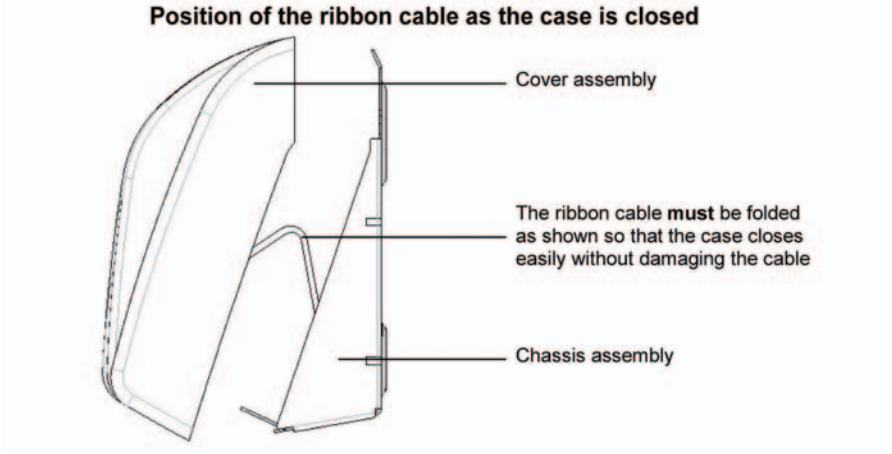
4) Hold the chassis in place with a screw through the mounting slot.

5) Adjust the position of the chassis assembly, and fix it in place by tightening all three screws.

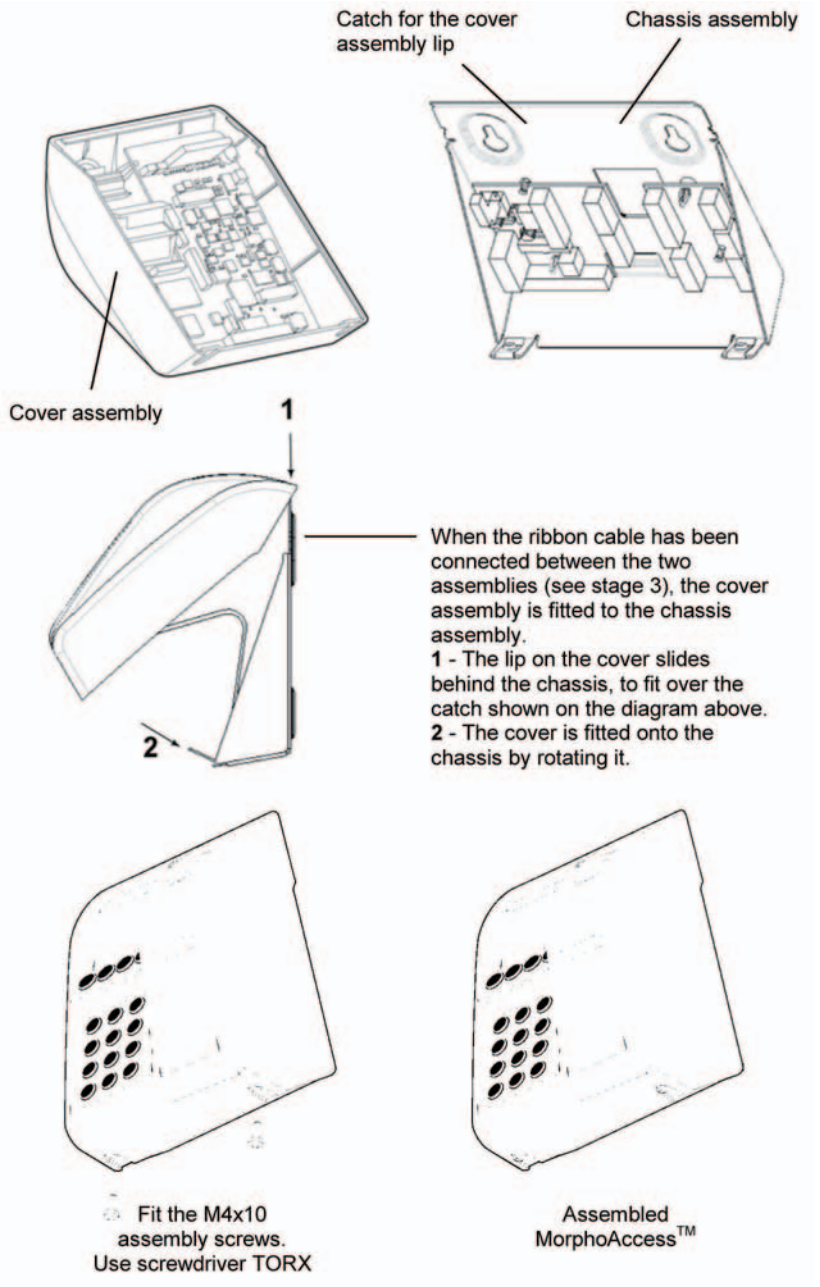
6) Connect the cables to the terminal blocks (see the detailed instructions in the following sections).

## Stage 3: Connecting the chassis assembly to the cover assembly



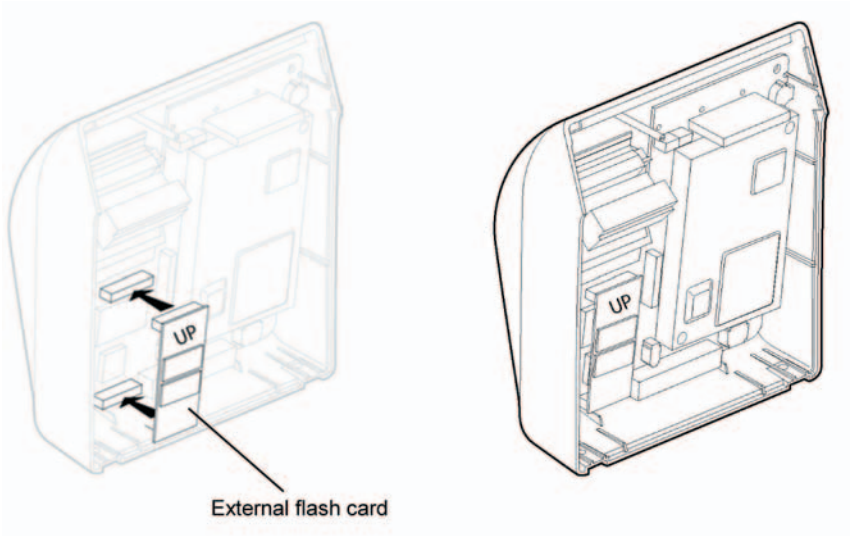



## Stage 4: Closing MorphoAccess™



# How to upgrade MorphoAccess™ 200 to 300

This operation requires that the MorphoAccess™ is powered off.




When the optional flash card is inserted, the MorphoAccess™ 200 becomes a MorphoAccess™ 300. All subsequent database information will be stored on the new media.

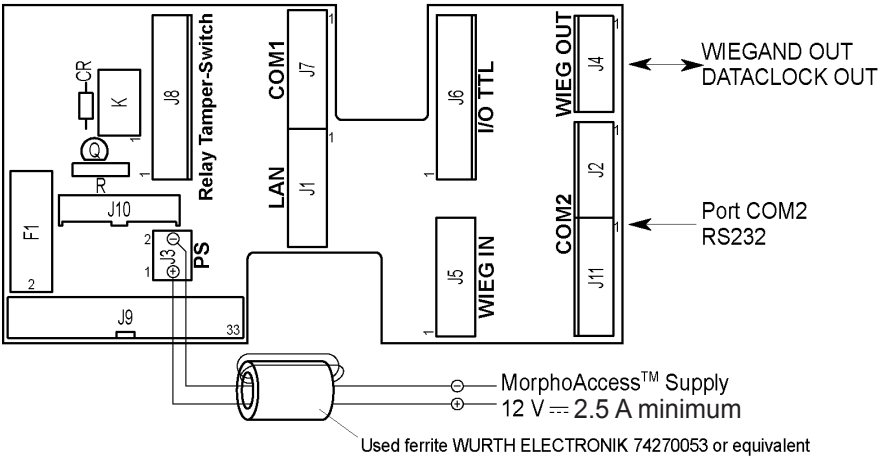
**Warning**: All database information of the MorphoAccess™ 200 is lost.

**Warning**: When transferring an external flash card from a MorphoAccess™ 300 to another, you will lose access to all database information written on the card.

For more information, refer to the MorphoAccess™ Host System Interface Specification.

# Electrical Interfaces

## Terminal block board



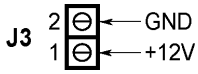

**For EMC compatibility**: To be EC and FCC compliant (EN55022, EN55024 FCC part 15), each interface cable and 12V power supply cable must be threaded and wrapped through an axial ferrite bead.

| | | |
|---|---|---|
| J1 | 5 pin block | Ethernet Interface (LAN 10Mbps) |
| J3 | 2 pin block | 12 V supply ± 5% regulated |
| J4 | 4 pin block | Wiegand output to host or Data Clock output |
| J5 | 5 pin block | Wiegand peripheral input or Data Clock output |
| J7 | 5 pin block | COM1 RS485/422 serial interface |
| J8 | 7 pin block | Output relay and Tamper-Switch |
| J11 | 5 pin block | COM2 reduced RS232C serial interface |
| J9 | 34 way ribbon cable | Connection to main assembly |
| F1 | Fuse | 2.5 A quick blow fuse |
| J2 | 9 pin block | COM2 full RS232C serial interface (optional)[1] |
| J6 | 7 pin block | 6 input/output 5 V TTL interface (optional)[1] |
| J10 | 20 way interconnection | Connection to main assembly (optional)[1] |
| J11 | 5 pin block | RS422 serial interface (optional)[1] |

[1]For more information, please contact SAGEM MORPHO, Inc..

## Power supply cable

The terminal blocks are shown viewed from the front with the chassis assembly in its normal position on the wall.

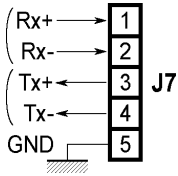



**Terminal block J3**

| | | |
|---|---|---|
| Pin 1 | +12V | Power |
| Pin 2 | Ground | Power |

Power supply 12 V ± 5% (regulated) 2.5 A/min

## COM1 RS485/422 serial port wiring

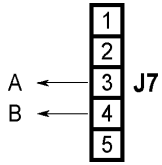



**Terminal block J7**

| | | |
|---|---|---|
| Pin 1 | Rx+ | Input |
| Pin 2 | Rx- | Input |
| Pin 3 | Tx+ | Output |
| Pin 4 | Tx- | Output |
| Pin 5 | Ground | Ground |

For an RS485 multi drop (half duplex) connection, only Tx+, Tx- and ground are connected. Otherwise, as the unit is a peripheral, the connections must be crossed over: Rx on the MorphoAccess™ is connected to Tx on the host and Tx on the MorphoAccess™ is connected to Rx on the host.

## COM1 Deister wiring (optional)




**Terminal block J7**

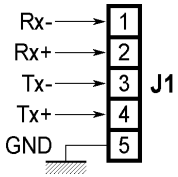
| | | |
|---|---|---|
| Pin 3 | A | Input/Output |
| Pin 4 | B | Input/Output |

To use the features of the optional Deister contactless card reader, connect the AB wires to the Tx port.

AB wires are connected to the Deister contactless card reader as defined in its installation manual.

For more information about this option, please contact your MorphoAccess sales representative.

## Ethernet wiring




**Terminal block J1**

| | | |
|---|---|---|
| Pin 1 | Rx+ | Input |
| Pin 2 | Rx- | Input |
| Pin 3 | Tx+ | Output |
| Pin 4 | Tx- | Output |
| Pin 5 | Ground | Ground |

See Appendix 1, Ethernet color standard.

## COM2 RS232 wiring

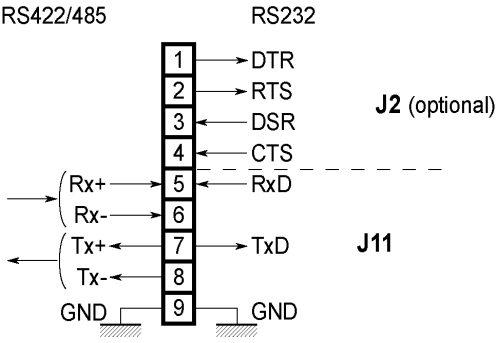
For a reduced RS232C (no handshake), only TxD, RxD and ground are connected on J11.

**Terminal block J11**: Reduced RS232

| | | |
|---|---|---|
| Pin 5 | RxD | Input |
| Pin 6 | Not connected | |
| Pin 7 | TxD | Output |
| Pin 8 | Not connected | |
| Pin 9 | Ground | Ground |

**Terminal block J2/J11**: Full RS232C (optional)

| | | |
|---|---|---|
| Pin 1 | DTR (Connected to DSR on the host) | Output |
| Pin 2 | RTS (Connected to CTS on the host) | Output |
| Pin 3 | DSR (Connected to DTR on the host) | Input |
| Pin 4 | CTS (Connected to RTS on the host) | Input |
| Pin 5 | RxD (Connected to TxD on the host) | Input |
| Pin 6 | Not connected | |
| Pin 7 | TxD (Connected to RxD on the host) | Output |
| Pin 8 | Not connected | |
| Pin 9 | Ground | Ground |



## COM2 RS422 wiring

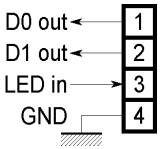
COM2 can also be configured for RS422.

**Terminal block J11**: RS485/422 (optional)

| | | |
|---|---|---|
| Pin 1 | Not connected | |
| Pin 2 | Not connected | |
| Pin 3 | Not connected | |
| Pin 4 | Not connected | |
| Pin 5 | Rx+ (Connected to Tx+ on the host) | Input |
| Pin 6 | Rx- (Connected to Tx- on the host) | Input |
| Pin 7 | Tx+ (Connected to Rx+ on the host) | Output |
| Pin 8 | Tx- (Connected to Rx- on the host) | Output |
| Pin 9 | Ground | Ground |

**Warning**: Except for reduced RS232C (TXD, RxD and GND), the options full RS232C and RS485/422 need the optional cable on J10.

## Wiegand output wiring

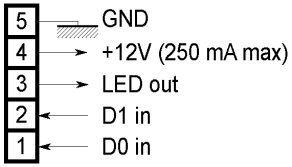



**Terminal block J4**

| | | |
|---|---|---|
| Pin 1 | Data 0 | Output |
| Pin 2 | Data 1 | Output |
| Pin 3 | LEDin | Input |
| Pin 4 | Ground | Input |

The electrical interface conforms to the Security Industry Association's Wiegand standard, March 1995.

## Wiegand input wiring

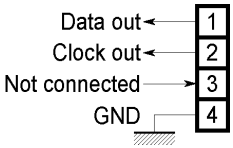



**Terminal block J5**

| | | |
|---|---|---|
| Pin 1 | Data0 | Input |
| Pin 2 | Data0 | Input |
| Pin 3 | LEDout | Output |
| Pin 4 | +12V | Power |
| Pin 5 | Ground | Input/Output |

The electrical interface conforms to the Security Industry Association's Wiegand standard, March 1995.

## Data clock output wiring

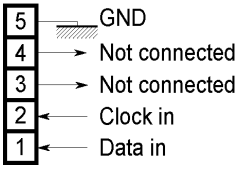



**Terminal block J4**

| | | |
|---|---|---|
| Pin 1 | Data | Output |
| Pin 2 | Clock | Output |
| Pin 3 | NC | |
| Pin 4 | Ground | Ground |

The electrical interface is 5 V TTL.

## Data clock input wiring



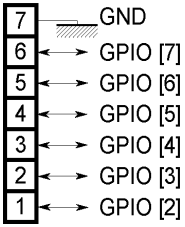

**Terminal block J5**

| | | |
|---|---|---|
| Pin 1 | Data | Input |
| Pin 2 | Clock | Input |
| Pin 3 | NC | |
| Pin 4 | NC | |
| Pin 5 | Ground | Ground |

The electrical interface is 5 V TTL compatible.

## Input / output wiring (optional)

**Input / Output**



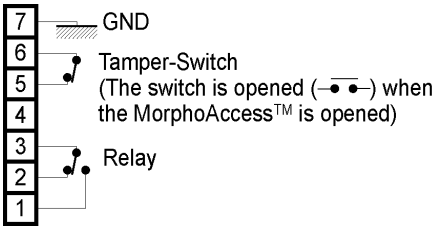

**Terminal block J6**

| | | |
|---|---|---|
| Pin 1 | GPIO[2] | Input /Output |
| Pin 2 | GPIO[3] | Input /Output |
| Pin 3 | GPIO[4] | Input /Output |
| Pin 4 | GPIO[5] | Input /Output |
| Pin 5 | GPIO[6] | Input /Output |
| Pin 6 | GPIO[7] | Input /Output |
| Pin 7 | Ground | Ground |

**Warning**: This option requires the optional cable on J10.

## Output relays and Tamper switch

A three-pin output relay is available. It has a common contact, a normally open contact and a normally closed contact.




**Terminal block J8**

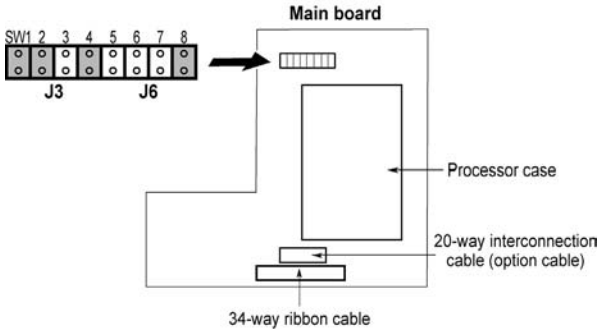
| | | |
|---|---|---|
| Pin 1 | Normally open | |
| Pin 2 | Normally closed | |
| Pin 3 | Common | |
| Pin 4 | Unused | |
| Pin 5 | Tamper switch | |
| Pin 6 | Tamper switch | |
| Pin 7 | Ground | Ground |

**Relay ratings**

1 A at 30 VDC according to the extra low voltage safety requirements (42.4 VAC max, 60 VDC max) independent of the power supply.

# Configuring the MorphoAccess™

## Motherboard configuration




SW1: Wiegand input

| | | |
|---|---|---|
| Open | = | Wiegand Mode |
| Closed | = | Dataclock Mode |

SW2: Wiegand output

| | | |
|---|---|---|
| Open | = | Wiegand Mode |
| Closed | = | Dataclock Mode |

SW3-6: Reserved for future use

SW3 must be open
SW4 must be closed
SW5 must be open
SW6 must be open

SW7-8: Wiegand Input (Interrupts)

| | | | |
|---|---|---|---|
| Open | Open | = | Not allowed |
| Closed | Open | = | Wiegand Mode |
| Open | Closed | = | Dataclock Mode, default |
| Closed | Closed | = | Not allowed |

## Optional communications cable

If your installation requires complete RS232 or RS485/422 COM2 or I/O TTL communications, an optional 20 wire cable is required between the MorphoAccess™ motherboard and the terminal block board (J10). Contact your MorphoAccess vendor for more information.

# MorphoAccess™ Technical characteristics

## Display

- Back-lit LCD 136 x 34 pixels

## Keyboard

- Back-lit with 12 numerical keys
- With 4 functions keys

## Fuse

- 2.5 A quick blow

## Memory

- 512 Kbytes
- Optional 32-Mbyte Flash memory for data storage only on MA 300

## Peripherals interfaces

- COM1 RS422/RS485
- COM2 RS232 or optional RS422/RS485
- Ethernet 10 Base T
- Wiegand or Dataclock ISO2 output
- Wiegand or Dataclock ISO2 input
- 6 optional I/O
- Relay
- Tamper switch.

## Power supply

- 12 V ± 5% 2.5 A minimum power supply

  Cable cross section depends on the length: 0.75 mm² recommended

## Size and weight

This product is designed for indoor use only.

- 70 x 160 x 145 mm
- 750 g

## Environmental conditions

| | |
|---|---|
| • Operating temperature | + 0°C to + 40°C |
| • Humidity | 10% < RH < 80% |
| • Light | The MorphoAccess™ should be installed in controlled lighting conditions (avoid direct exposure to sunlight) |
| • UV | Avoid exposure to UV |

## Storage conditions

| | |
|---|---|
| • Temperature | - 20°C to 70°C |
| • Humidity | < 95% |

# Recommendations

## Areas containing combustibles

It is strongly recommended that you do not install your MorphoAccess™ in the vicinity of gas stations, petroleum processing facilities or any other facility containing flamable or combustable gasses or materials.

## General precautions

- Do not attempt to repair your MorphoAccess™ 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 MorphoAccess™ in damp areas. Protect it from water and other liquids.
- Do not expose your MorphoAccess™ to extreme temperatures.
- Use your MorphoAccess™ with original accessories. Attempts to integrate the MorphoAccess™ 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 MorphoAccess™ has been installed.

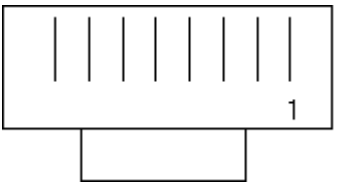
**Warning**: The manufacturer cannot be held responsible if the above recommendations are not followed or if the MorphoAccess™ is incorrectly used.

# Appendix 1 - Ethernet color standard

| Pinout | Signals | EIA/TIA T568B color | EIA/TIA T568A color | Corel L120 color |
|---|---|---|---|---|
| 1 | TD(+) Transmit Data Plus (Output) | White Orange | White Green | Grey |
| 2 | TD(-) Transmit Data Minus (Output) | Orange | Green | White |
| 3 | RX(+) Receive Data Plus (Input) | White Green | White Orange | Pink |
| 4 | No connection | Blue | Blue | Orange |
| 5 | No connection | White Blue | White Blue | Yellow |
| 6 | RX(-) Receive Data Minus (Input) | Green | Orange | Blue |
| 7 | No connection | White Brown | White Brown | Purple |
| 8 | No connection | Brown | Brown | Brown |

**RJ45 Pinout**

Compliant with 10 base T IEEE Specification.

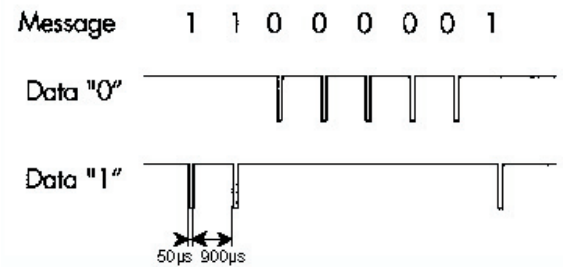


# Appendix 2 - Wiegand data format

The 26 bits of transmission consists of two parity bits and 24 code bits. The 8 first code bits are encoding the facility code. This code identifies each MorphoAccess™ in a network. The 16 other bits are data bits. The first bit transmitted is the first parity bit. It is even parity calculated over the first 12 bits. The last bit transmitted is the second parity bit. It is odd parity bit calculated over the last 12 code bits.

| Even parity (1 bit) | Facility code (8 bits) | Data (16 bits) | Odd parity (1 bit) |
|---|---|---|---|

Compliant with access control 26-Bit - Wiegand reader interface standard 03/1995.



# Appendix 3 - ISO 7811/2-1995 - Track 2 Dataclock format

Compliant with ISO07811/2-1995 - Track 2.

**Data encoding table**

| Value | Bitpattern | Meaning |
|---|---|---|
| 0 | 0 0 0 0-1 | “0” |
| 1 | 1 0 0 0-0 | “1” |
| 2 | 0 1 0 0-0 | “2” |
| 3 | 1 1 0 0-1 | “3” |
| 4 | 0 0 1 0-0 | “4” |
| 5 | 1 0 1 0-1 | “5” |
| 6 | 0 1 1 0-1 | “6” |
| 7 | 1 1 1 0-0 | “7” |
| 8 | 0 0 0 1-0 | “8” |
| 9 | 1 0 0 1-1 | “9” |
| 10 ($A_{hex}$) | 0 1 0 1-1 | unused character |
| 11 ($B_{hex}$) | 1 1 0 1-0 | start sentinel (start character) |
| 12 ($C_{hex}$) | 0 0 1 1-1 | unused character |
| 13 ($D_{hex}$) | 1 0 1 1-0 | field separator |
| 14 ($E_{hex}$) | 0 1 1 1-0 | unused character |
| 15 ($F_{hex}$) | 1 1 1 1-1 | end sentinel (stop character) |

The least significant bit of every digit is sent first; the fifth bit is an odd parity bit for each group of 4 data bits.

The complete message always looks as follows:

| left edge | start | data characters | end | LRC | right edge |
|---|---|---|---|---|---|

The LRC is calculated by the following procedure: each of the 4 bits in the LRC character is an even parity bit of the equivalent bits in the telegram including start and stop sentinel.

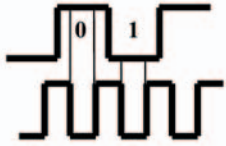
The fifth bit is the odd parity of the 4 LRC bits (it is not calculated over all the parity bits).

**Dataclock levels**

In normal operation mode (default) in and out signals are defined as:

data

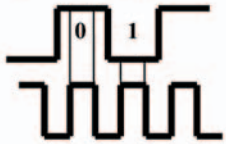
strobe




Other modes are (only for output):

data

inverted strobe




inverted data

strobe


inverted data

inverted strobe

# Appendix 4 - Reserved configuration keys

**Those keys are for internal use only.**
**For proper operation, this settings should not be changed.**

**/cfg/lcd0/display/type : 1**
**/cfg/lcd0/contrast/value : 0**

**/cfg/serx/mode/connection: EXT**
**/cfg/serx/mode/mode: 450**

**db/seq flash/start: 0**

**/cfg/bio/video/channel: 0**
**/cfg/bio/video/rotation: 0**

**/cfg/lic/licences/***

# Appendix 5 - MORPHO® BRAND BIOMETRIC PRODUCT

# WARRANTY, LIMITATIONS, AND SOFTWARE LICENSE

**1. LIMITED WARRANTY AND MAINTENANCE.** Subject to the Disclaimers and Limitations of Warranty set forth below, SAGEM MORPHO, Inc., (hereinafter "SMI," or its licensed reseller, as may be applicable) provide the following limited warranty, for the benefit of original Customer only, that all hardware components of the Morpho® brand biometric product with which this information is associated will conform to the applicable hardware product specifications as published by SMI and will be in good working order and free from material defects in materials or workmanship, given Customer's normal use and service (the "Hardware Limited Warranty"). It is further warranted that the Morpho® brand biometric software provided with, and/or loaded into and resident in the biometric product will conform to the applicable software specifications or SMI documentation published by SMI, given Customer's normal use and operation (the "Software Limited Warranty"). Any and all third party software programs supplied with the biometric product are subject to their respective manufacturer's warranty and license terms only, and SMI assumes no responsibility for such software.

The Hardware Limited Warranty extends for one (1) year from the date of Customer's receipt of delivery of the biometric product. The Software Limited Warranty extends for ninety (90) days from the date of Customer's receipt of delivery of the biometric product. During the duration of the Hardware and Software Limited Warranties, the first level of support shall be provided by telephone "Help Desk" support (the applicable Help Desk telephone number is included with the packaged biometric product). Hardware repairs which cannot be remedied through Help Desk consultation shall be made by returning the hardware component to an authorized SMI service depot, in accordance with instructions issued by the service depot, at Customer's expense. Return delivery of the repaired or replaced component shall be at SMI's expense. SMI shall repair or replace any nonconforming hardware component at its sole election. Software problems not remedied through Help Desk consultation may be corrected through software patches or updates issued by SMI or by replacement of the unit in which the software is resident, at SMI's sole election. The Limited Software Warranty does not entitle the customer to automatically receive patches, updates or other notification of software correction or revision during the duration of the warranty. The original warranty periods shall not be renewed or extended by subsequent repair or replacement.

Biometric product maintenance after expiration of the one (1) year warranty may be available pursuant to the terms and conditions of a separate Maintenance Agreement – please contact the location from which the biometric product was

purchased for further details.

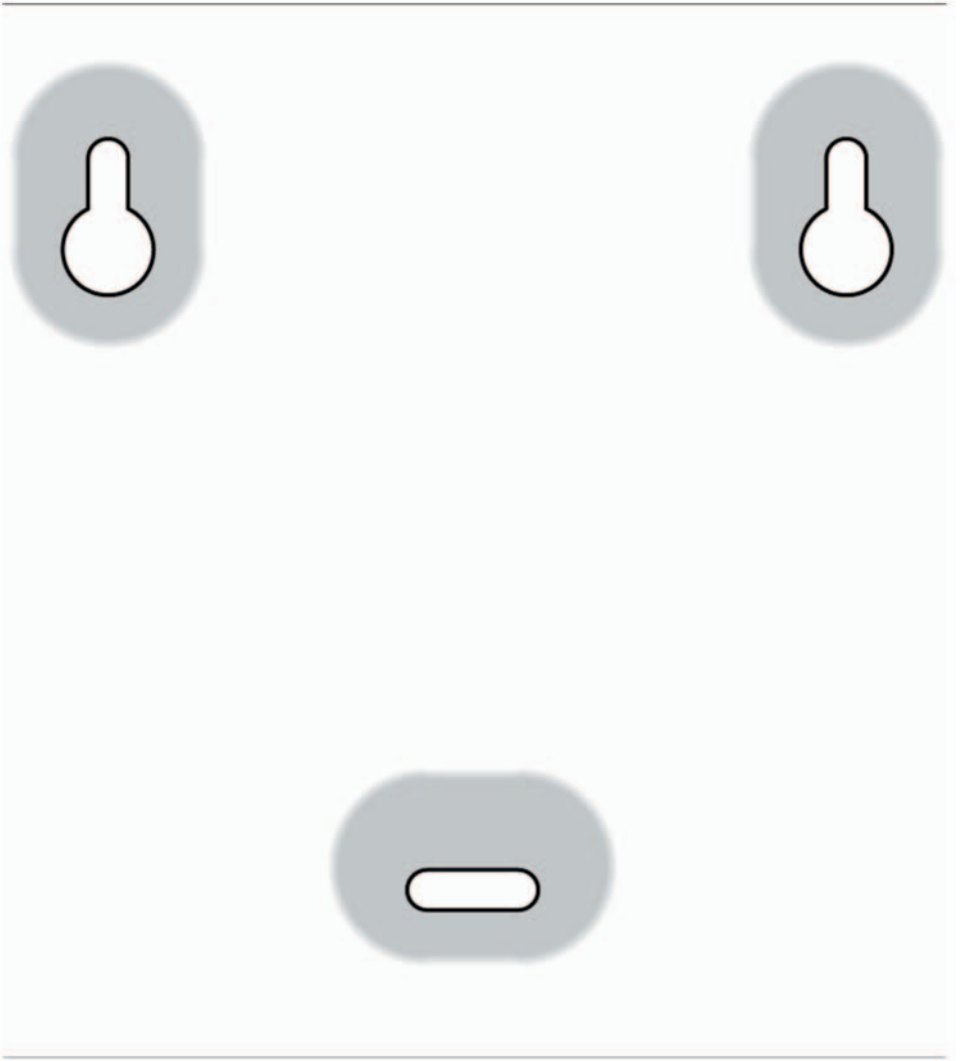
**2. LIMITATIONS AND DISCLAIMERS OF WARRANTY.** SMI does not warrant that operation of the biometric product will be uninterrupted or error-free; further, no biometric product or system can be guaranteed to be 100% accurate, or to properly enroll, identify, or authenticate every individual. SMI shall have no responsibility for repairing or otherwise remedying any defect or nonconformity in the condition or operation of the biometric product or its software if: 1) modifications to Customer's site are necessary for proper operation, and Customer's site preparation is inadequate; 2) the biometric product is not professionally installed in accordance with applicable industry standards, local building/zoning codes such as the National Electric Code, and proper installation practices; 3) the biometric product is not maintained and operated with all proper accessories under normal conditions by competent personnel; 4) the biometric product incorporates replacement parts not authorized by SMI; 5) the biometric product has been subjected to disassembly except as required for normal installation, modification beyond what is described in SMI-supplied installation and operation guides, unauthorized enhancement, abuse or misuse; or 6) the defect or nonconformity has not been reported to the designated Help Desk within ten (10) days of its discovery by Customer. As Customer's sole and exclusive remedy for any nonconformity or defect in the condition or operation of the biometric product for which SMI is responsible, SMI shall provide its reasonable efforts to remedy same as set forth in Section 1, above during the applicable stated Limited Warranty Period. With the exception of its Limited Warranties set forth in Section 1, above, **TO THE MAXIMUM EXTENT ALLOWED BY APPLICABLE LAW, SMI DISCLAIMS ANY AND ALL PROMISES, REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE BIOMETRIC PRODUCT, ITS HARDWARE, SOFTWARE, DESIGN, OR FUNCTIONALITY, OR ITS MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, OR ARISING FROM USAGE OF TRADE, COURSE OF DEALING, OR COURSE OF PERFORMANCE. SMI FURTHER DISCLAIMS ANY AND ALL PROMISES, REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO ANY OF SMI'S SERVICES PERFORMED HEREUNDER.**

**3. LIMITATIONS OF LIABILITY.** The entire liability of SMI to Customer (or to any person or entity claiming through Customer) for any claim whatsoever related to the biometric product or the parties' transaction shall not exceed the total amount of all payments made for the biometric product by Customer to the date of the claim. **IN NO EVENT SHALL SMI BE LIABLE TO CUSTOMER FOR ANY LOST PROFITS, LOST INFORMATION, BUSINESS INTERRUPTION, OR OTHER CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR INDIRECT DAMAGES (WHETHER IN AN ACTION IN CONTRACT OR TORT OR BASED ON WARRANTY), EVEN IF SMI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, ARISING OUT OF, OR RELATED TO, THE BIOMETRIC PRODUCT OR THE PARTIES' TRANSACTION.** Some jurisdictions do not allow excluding or limiting implied warranties, or limiting liability for incidental or consequential damages, and some jurisdictions have special statutory consumer protection provisions that may supersede this limitation. As a result, the limitations and disclaimers of warranty and liability set forth herein may not apply to Customer if prohibited by the laws of Customer's jurisdiction.

**4. RESTRICTION ON EXPORTATION.** Certain biometric products and associated software may have restrictions upon their exportation outside the United States of America, and the applicable U.S. Government regulations and restrictions are

subject to frequent change. Customer shall comply with all applicable laws, rules and regulations of governmental authorities, now or hereafter in effect, including, without limitation, the U.S. Export Administration Act and other U.S. export controls. Customer agrees that Customer will not export or re-export, directly or indirectly, the SMI biometric products or software to any country, person, or entity subject to U.S. export restrictions.

## Drilling Template



SAGEM MORPHO, Inc.

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SAGEM MORPHO, Inc.

# MorphoAccess™ Terminal

## Installation Guide Update

M142-005C
September 2003

SAGEM MORPHO, Inc.
Tacoma, Washington 98402

## Contents





MorphoAccess™ Terminal Installation Guide Update, Document M142-005C

SAGEM MORPHO, Inc., 1145 Broadway Plaza, Tacoma, WA 98402 USA
September 2003

# FCC Compliance of MorphoAccess™ 200, 220, 300, 200E, 220E, and 300E

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This FCC compliance is for MorphoAccess™ products as delivered to you, the customer. Any changes or modifications not expressly approved by SAGEM MORPHO, Inc. could void your authority to operate MorphoAccess™ products.

# Installing Ferrite Beads on Interface Cables for MorphoAccess™ 200 and 300

This document provides an overview of ferrite beads and explains how to install them on the power, Wiegand, RS-422, and Ethernet cables that you connect to the MorphoAccess™ 200 or 300. To meet FCC requirements for Class B computing devices, a ferrite bead must be installed on every cable connected to the MorphoAccess 200 or 300 — only if the MorphoAccess serial number starts with 01 or 02.

### What is a Ferrite Bead?

Ferrite beads are radio frequency (RF) absorbers. To see an example of a ferrite bead, look at a monitor video cable or a laptop computer power cable that is connected to your computer. The walnut-sized protrusion that is molded near one end of the cable is a ferrite bead. The size and shape of the ferrite bead determines the amount of RF that is absorbed. The amount of RF that a device emits determines the type of ferrite bead that is required to provide the proper absorption.

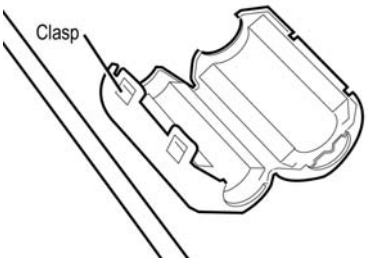
The ferrite beads supplied with your MorphoAccess 200 or 300 terminal have been properly sized to absorb the correct amount of RF to comply with FCC requirements.

### Installing a Ferrite Bead

Check the serial number on the back of the MorphoAccess. If the serial number starts with 01 or 02, install one ferrite bead on each cable before you install the MorphoAccess 200 or 300 terminal.

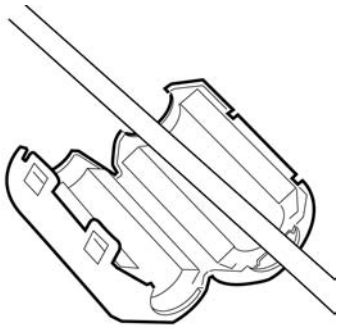
  

1. Select the interface cable that you want to work with and open a ferrite bead by releasing the clasps on the side.




2. Position the ferrite bead on the cable as close as possible to (but not inside) the MorphoAccess.

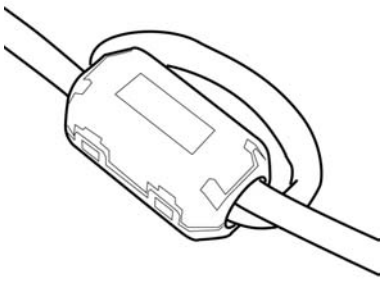
   Lay the cable inside the groove.



3. Bend the cable around the ferrite bead to form a loop and lay it again inside the ferrite bead.

   Make sure the cable circles the ferrite bead so that it passes through the ferrite bead twice.

4. Close the two halves of the ferrite bead and securely fasten the clasps without pinching the cables.



**Ordering Ferrite Beads**

To order more ferrite beads (Ferrico F5-NF-80B) for your MorphoAccess 200 or 300 interface cable, contact SAGEM MORPHO, Inc. at 1-800-526-2674. Ask for part number 1205-294001-0.

# Installing Ferrite Beads on Interface Cables for MorphoAccess™ 220

This document provides an overview of ferrite beads and explains how to install them on the power, Wiegand, RS-422, and Ethernet cables that you connect to the MorphoAccess™ 220. To meet FCC requirements for Class B computing devices, a ferrite bead must be installed on all cables connected to the MorphoAccess.

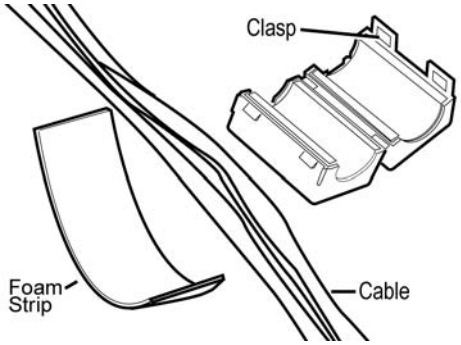
### What is a Ferrite Bead?

Ferrite beads are radio frequency (RF) absorbers. To see an example of a ferrite bead, look at a monitor video cable or a laptop computer power cable that is connected to your computer. The walnut-sized protrusion that is molded near one end of the cable is a ferrite bead. The size and shape of the ferrite bead determines the amount of RF that is absorbed. The amount of RF that a device emits determines the type of ferrite bead that is required to provide the proper absorption.

The ferrite beads supplied with your MorphoAccess 220 terminal have been properly sized to absorb the correct amount of RF to comply with FCC requirements.

### Installing a Ferrite Bead

After all the cables have been routed through the wall, place a single ferrite bead around all of them before you install the MorphoAccess 220 terminal. See instructions below. The foam strip will be compressed in the ferrite bead to prevent the ferrite bead from slipping down the cable.

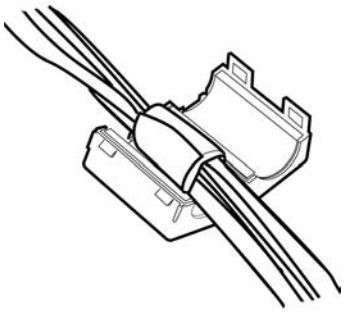



1. Open a ferrite bead by releasing the clasp on the side.
2. Determine where the ferrite bead will be positioned on the cables. It should be positioned as close as possible (but not inside) to the MorphoAccess terminal.

   Ensure that sufficient cable slack will be available to route the cables inside the MorphoAccess and to attach the wires to the terminal block.

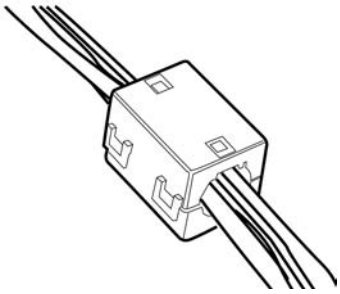
3. Wrap the foam tightly around all the cables at the position where the ferrite bead will be placed.



4. Lay the foam-wrapped cable inside the groove of the ferrite bead.

5. Close the two halves of the ferrite bead and securely fasten the clasps.

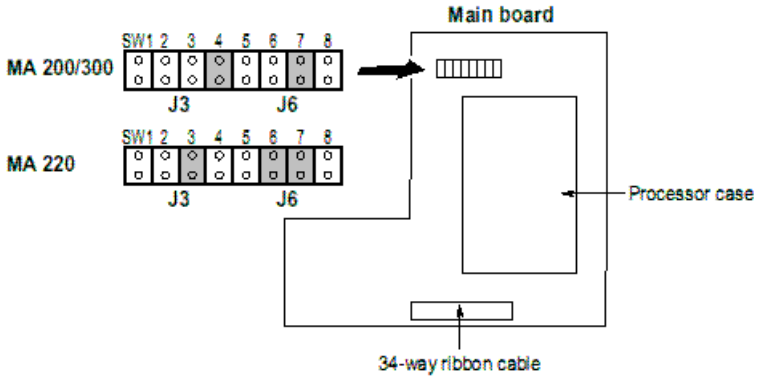
   If the ferrite bead does not close easily, trim the foam slightly, but not so much that the ferrite bead will slide away from the terminal.



**Ordering Ferrite Beads or Foam Cable Wrap for Ferrites**

To order more ferrite beads (Fair-Rite 04441 73551) for your MorphoAccess 220 interface cables, contact SAGEM MORPHO, Inc. at 1-800-526-2674. Ask for part number 1205-364001-0. To order more foam cable wrap for ferrites, ask for part number 0999-900019-0.

# MorphoAccess™ Motherboard Jumper Configuration




SW1: Wiegand input

| | | |
|---|---|---|
| Open | = | Wiegand Mode (default) |
| Closed | = | Dataclock Mode |

SW2: Wiegand output

| | | |
|---|---|---|
| Open | = | Wiegand Mode (default) |
| Closed | = | Dataclock Mode |

SW3-6: Reserved (MA200/300)

| | |
|---|---|
| SW3 must be open | = |
| SW4 must be closed | = |
| SW5 must be open | = |
| SW6 must be open | = |

SW3-6: Reserved (MA220)

SW3 must be closed
SW4 must be open
SW5 must be open
SW6 must be closed

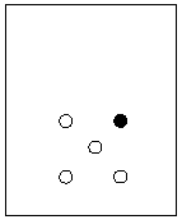
SW7-8: Wiegand Input (Interrupts)

| | | |
|---|---|---|
| Open Open | = | Not allowed |
| Closed Open | = | Wiegand Mode (default) |
| Open Closed | = | Dataclock Mode |
| Closed Closed | = | Not allowed |

# MorphoAccess™ Serial Port is RS-422 Only

The COM1 serial port supported in all MorphoAccess™ products is RS-422 only, not RS-485 as shown in the installation guides. Below is the correct RS-422 wiring diagram for MorphoAccess™ 200E, 220E, and 300E (outdoor units).

| RS-422 Cable | |
|---|---|
| Color/stripe | Function |
| White/Green | RX+ |
| Green/White | RX- |
| White/Orange | TX+ |
| Orange/White | TX- |
| Blue/White | GND |



# Ethernet Connections to MorphoAccess™

It is recommended to use shielded category 5 (Cat 5) Ethernet cable (120 ohm impedance). It is also strongly recommended to install a repeater unit every 300 ft (90 m). Extreme care must be taken when connecting the Ethernet wires to the terminal block board during installation, since low quality connections may degrade the Ethernet signal sensitivity. The receive wires Rx+ and Rx- should be connected from the same twisted pair of wires, and the transmit wires Tx+ and Tx- should also be connected from the same twisted pair of wires.

# MorphoAccess™ 300 Memory Extension Board

Under certain very harsh shipping conditions, the memory extension board of the MorphoAccess™ 300 (indoor MorphoAccess only) might become disconnected. You should check that the memory board is properly attached before connecting power to the MorphoAccess 300. When you disassemble the MorphoAccess 300 to mount it on a wall, make sure the memory board is properly aligned with the pins (see page 9 of the Installation Guide). There are two sets of 26 connector pins, but each connector on the memory extension board has only 24 socket holes. Align the memory extension board such that it uses the sets of 24 pins closest to the large silver shield. Push on the memory extension board to make sure it is firmly seated on the connector pins.

# MorphoAccess™ Power Supply Selection Outside the United States

When any model MorphoAccess™ is installed, it is the responsibility of the installer to provide an IEC 60950-certified power supply that is marked Limited Power Source (or “LPS”) and rated at 12 VDC, 2.5 A minimum. This applies to indoor units (MA200, 220, and 300) as well as outdoor units (MA200E, 220E, and 300E).

# SAGEM SA
# MorphoAccess™ 200/200E and 300/300E


This guide is for the MorphoAccess family of products

## Software Guide

**Software Revision 4.42**

SAGEM

# CONTENTS

# Introduction

Thanks for choosing the MorphoAccess™ Automatic Fingerprint Recognition Terminal. MorphoAccess provides an innovative and effective solution for access control or time and attendance applications using fingerprint verification and/or identification.

The MorphoAccess terminal integrates SAGEM image processing and feature 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 creation of literally millions of individual fingerprint identification records.

We believe you will find the MorphoAccess fast, accurate, easy to use and suitable for physical access control or time and attendance.

The MorphoAccess offers the following advantages:

- Has a high quality optical scanner.
- Supports multiple input/output interfaces used in the physical access control industry.
- Has a local area network interface for easy interaction with other host systems.
- Is compact in size for easy installation and integration into your available office space.
- Has an Intuitive interface that is easy to use in both setup and operational modes.
- Has extensive, flexible flash memory for data storage, including user data and biometric templates.

This guide allows you to configure the software parameters to meet your installation requirements.The following lists some of the configurable parameters:

- Administrator mode versus User mode
- Identification versus Authentication
- Standalone versus Client/Server
- Database management functions – enroll or delete
- Configure network parameters
- Configure juvenile processing
- Set matching threshold
- Set language preference – English, French, or Spanish
- Configure Welcome message
- Setup Wiegand and Data clock codes/parameters
- Configure COM port
- Configure relays
- Adjust contrast and brightness
- Set clock

To ensure the most effective use of your MorphoAccess, we recommend that you read this Software Guide in its entirety.

## MORPHOACCESS™ SOFTWARE USER INTERFACE

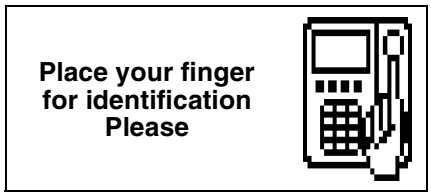
The SAGEM SA MorphoAccess™ terminal can operate in three modes: access control by identification, access control by authentication and proxy mode. Those modes are set in the Maccess/Admin/Mode configuration key.

The MorphoAccess™ 200 manages one base of 800(1) persons, locally or remotely. MorphoAccess™ 300 manages 16 bases of 3000 persons, remotely(2).

### Access control by identification (MorphoAccess™ 200)

To configure MorphoAccess™ terminal in this mode, use the system and edit /cfg/Maccess/Admin/mode, then enter **0**.

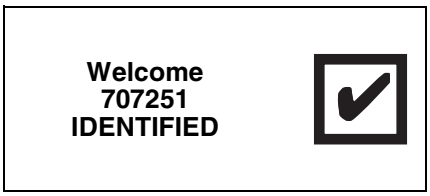
After starting the MorphoAccess™ terminal, waits for fingerprint detection in identification mode.




(1) In stand alone mode, the local base is sized for 800 persons, 2 fingers.
In MMS mode, it is possible to manage up to 1000 persons in a base, 2 fingers.

(2) For more information, see MorphoAccess™ Host System Interface Specification Ref.: 3000005996.

If the identification is successful, the terminal triggers the access or returns the corresponding ID to central security controller(3).




Once the person's identification is done, the terminal automatically loops back and waits for a new finger. This display remains for about 4 seconds.

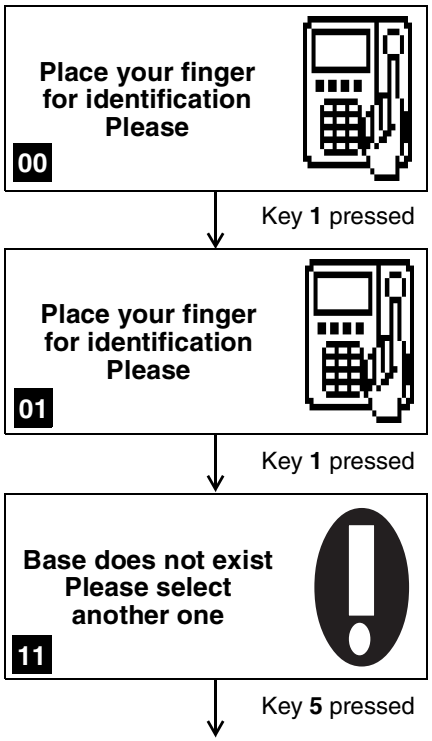
(3) Port used to exchange ID is either Weigand/Dataclock or COM1/COM2. The ID format send to COM port is described on Communication protocol section.

## Access control by identification (MorphoAccess™ 300)

To configure the MorphoAccess™ in this mode, use Asystem and edit /cfg/Maccess/Admin/mode, then enter **0**.

After starting the MorphoAccess™ terminal, waits for fingerprint detection in identification mode.

To select a user database, just press a key number to toggle the base number. Only bases 0 to 15 can be selected and used.

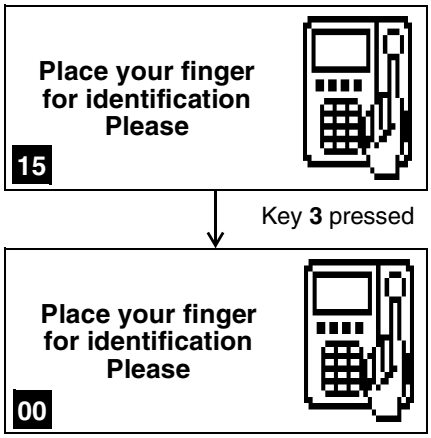



Original Identification Screen using base 0

Now using base 1

Base 11 selected but not used




If the identification is successful, the terminal triggers the access or returns the corresponding ID to central security controller.


Once the person's identification is done, the terminal automatically loops back, selects base 0 and waits for a new finger. This display remains for about 4 seconds.

## Access control by authentication (MorphoAccess™ 200 and 300)

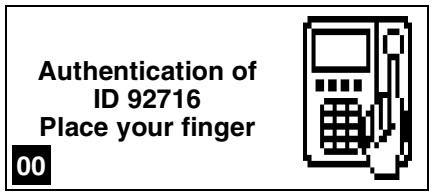
To configure the MorphoAccess™ in this mode, use Asystem and edit /cfg/Maccess/Admin/mode, then enter **1**.

This mode requires a peripheral equipment which will send the ID of the person to authenticate to the MorphoAccess™ Wiegand or Dataclock input.

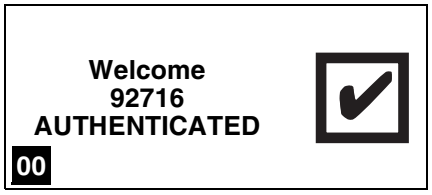
To trigger authentication:

- if using a MorphoAccess™ 300, select a valid user database as described in paragraph "Access control by identification".
- pass the user badge so the external reader sends the user ID on MorphoAccess™ Wiegand or Dataclock input.


If the ID exists in the selected database, the MorphoAccess™ performs an authentication using the biometric templates associated to this ID.




If the authentication is successful, the terminal triggers the access or returns the user ID to central security controller.



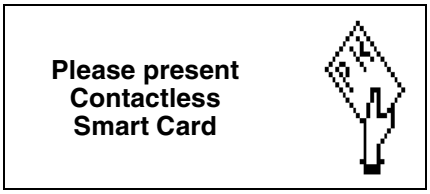

Once the person's authentication is done, the terminal automatically loops back, selects base 0 and waits for a new input ID. This display remains for about 4 seconds.

When using this feature, ID should be a value between 0 and 65535.

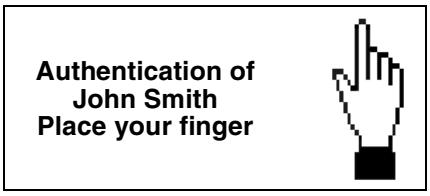
## Access control by contactless authentication: ID and templates on a MIFARE card (MorphoAccess™ 220)

To configure the MorphoAccess in this mode, use Asystem and edit /cfg/Maccess/Admin/mode, then enter **3**.

To trigger authentication, users should present their MIFARE card to the terminal. MorphoAccess™ will read the ID, the user's name and two biometric templates stored on the card.




Read templates are used for a 1:1 matching.

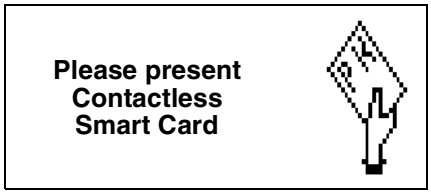



If the authentication is successful, the terminal triggers the access or returns the user ID to central security controller.

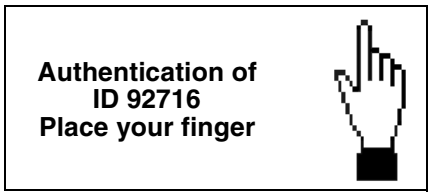
## Access control by contactless authentication: ID on a MIFARE card, local templates (MorphoAccess™ 220)

To configure the MorphoAccess in this mode, use Asystem and edit /cfg/Maccess/Admin/mode, then enter **4**.

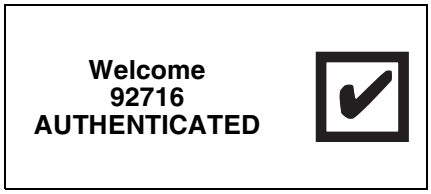
To trigger authentication, users should present their MIFARE card to the terminal. MorphoAccess™ will read the ID stored on the card.




If the ID exists in the selected database, the MorphoAccess™ performs an authentication using the biometric templates associated to this ID.




If the authentication is successful, the terminal triggers the access or returns the user ID to central security controller.



## Proxy mode

This mode allows to control the MorphoAccess™ remotely using a set of biometric and database management function interface access commands.

For more information, please contact SAGEM SA or refer to document 3000005996 MorphoAccess™ Host System Interface Specification.

To configure the MorphoAccess™ in this mode, use Asystem and edit /cfg/Maccess/Admin/mode, then enter **2**.

SAGEM

# SAGEM SA

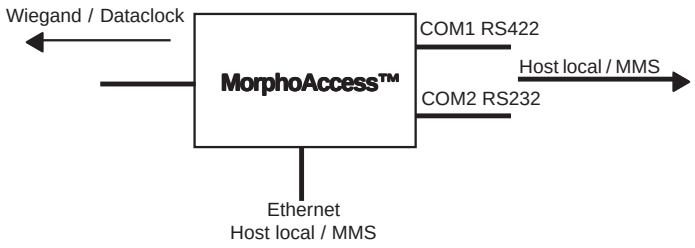
## MORPHOACCESS™ SOFTWARE ADMINISTRATOR INTERFACE

Application of the SAGEM SA MorphoAccess™ terminal allows:

1. Biometric management operations
   - Transfer of biometric data between the MorphoAccess™ terminal and MorphoAccess™ Management System (MMS).
   - In stand alone without the MorphoAccess™ management system (manages the biometric data in a local database on the MorphoAccess™) (MorphoAccess™ 200 only).
   - The MorphoAccess™ shall be configured in one of either of these modes (see this chapter).
2. Access to the set up functions of the system (request Administrator mode).

***Note 1***

The MMS handles the MorphoAccess™ through a set of command exchanges (two-way commands to and from the MMS server and the MorphoAccess™ terminal). If you wish to know more about this protocol and the command set, please contact SAGEM SA.




**System overview**

***Note 2***

For further information about the application protocol between MorphoAccess™. and MMS, please contact SAGEM SA. The specification document has the following reference: MorphoAccess™ Host System Interface Specification Ref.: 3000005996.

## Biometric management operations

**Biometric Management between terminal and MorphoAccess™ Management System (MMS)[4]**

MorphoAccess™ terminal includes an interface layer to communicate with the access control system or the MMS through Ethernet, RS422 and RS232 (For more information, see section Setting up Network Parameters).

The biometric management operations are:

- Insert template/ID in database: The terminal inserts a new record in the database.
- Remove template/ID from database: The terminal removes the record identified by the ID in the database.
- Update template/ID in database: The terminal changes the template identified by the ID in the database.
- Download database: The terminal reads the new database and installs it in a local database according to the database identifier.

If the MorphoAccess™ application receives the commands from MMS it will switch to base management mode. The operations sent by MMS are automatically registered in the database of the MorphoAccess™ terminal.

Managing a base locally is not possible. All biometric data is stored on the MMS and the terminal will act as a capture and send device only.

To access the Administrator menu with a MorphoAccess™ 300, first select the base in which the Administrator is enrolled then hit the following keys in sequence <#>, <*> and <#>. With a MorphoAccess™ 200 simply hit the following keys in sequence <#>, <*> and <#>.

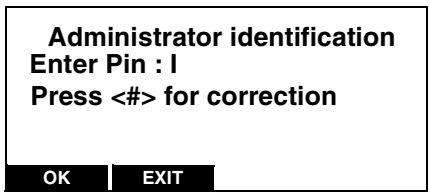
[4] For more information about MMS, please contact SAGEM SA.

The next screen is the Administrator screen. The blinking red led indicates that you are in administrator mode.


Biometric login is enabled if configuration key /cfg/Maccess/admin/admin ident is set to 1.

This operation creates a database with ID 0. This database can contain 800 records with two biometric data fields, an ID field and an Administrator field.

In order to access the Control menu, the Administrator's fingerprint template or pin must be entered (the default PIN is 12345). To enter the pin code[5] select the **PIN** menu.




You can use the correction key **#** to delete the last number hit. After a valid pin code or an Administrator identification, you will see the following screen:


[5] To change the pin code, see section Use Application System.

**Biometric management in stand alone[6] (MorphoAccess™ 200 only)**

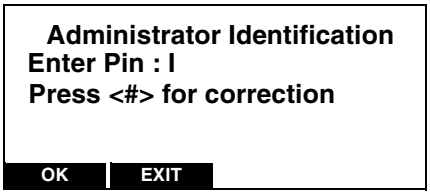
In stand alone mode, the MorphoAccess™ manages its own local database. This can be setup through the Administrator menus. On the keypad, hit the following keys in sequences <#>, <*> and <#>. The resulting screen is the Administrator menu.


Biometric login is enabled if configuration key /cfg/Maccess/admin/admin ident is set to 1.

This operation creates a database with ID 0. This database can contain 800 records with two biometric data fields, an ID field and an Administrator field.

In order to access the Control menu, the Administrator's fingerprint template or pin code must be entered. To enter the pin code[7], select the Pin menu.

You can use the correction key **#** to delete the last number hit.



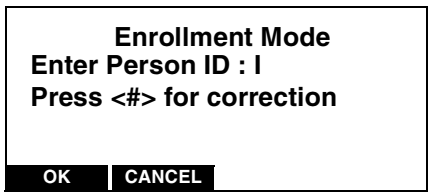

[6] To change the Biometric management mode, see section Use Application System.
[7] To change the pin code, see section Use Application System.

If the identification is successful, the application allows access to the biometric management functions. The biometric management operations are:

- Insert template/ID in database (enrollment): The terminal inserts a new record in the database.
- Remove template/ID from database (deletion): The terminal removes the record identified by the ID in the database.


**Insert template/ID in database (MorphoAccess™ 200 only)**

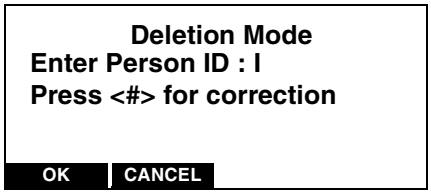
To insert template/ID in local database, select the **ENROLL** menu. You have to enter the ID of the person and validate it. The primary and secondary fingers are requested and their corresponding biometric templates are processed. If the process is successful, then the person is registered in the local database.




You can use the correction key # to delete the last digit entered. In the next screen you enroll your finger. Here You choose the user type Administrator or User.

**Remove template/ID from database (MorphoAccess™ 200 only)**

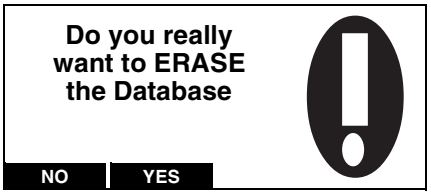
To remove a single template/ID record from the database, select the **DEL** menu. You will then have to enter the ID of the person and validate it. If the ID number does not exist in the local database, an error message appears.




You can use the correction key **#** to delete the last digit entered.

**Remove all template/ID from database (MorphoAccess™ 200 only)**

To remove all records from the local MorphoAccess™ database, select the **ERASE** menu option. A screen appears to confirm your command.

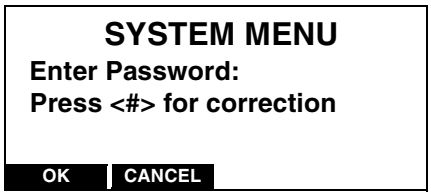


## Access the set up functions of the system

To access the System Menu, you must leave the main application of the MorphoAccess™. You must access the Administrator Menus (see the section Biometric Management in Standalone) if you are in fingerprint detection mode.

You must select the System Menu.


Then, select the ASYST menu to enter in the system application.




Enter the password to access to SYSTEM MENU (default value: 12345).

You can use the correction key # to delete the last digit entered. The password can be changed in the configuration file "/cfg/system" (see the section Setting up Administrator System Pin). The System Menu will appear when the password is correct.

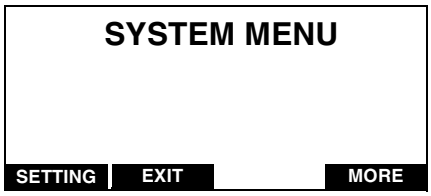
  


The **CONFIG** menu allows you to set up network and third-party applications and specify additional parameters.

The **VERSION** item allows you to browse for software modules present in your SAGEM MorphoAccess™ and see their revision number(s).

The **SER NB** item displays the terminal serial number, MicroBoot revision and Ethernet physical address of your machine.

The **MORE** key displays the rest of the system options.




The **SETTING** menu allows you to set the LCD contrast and the time and date.

## The CONFIG menu

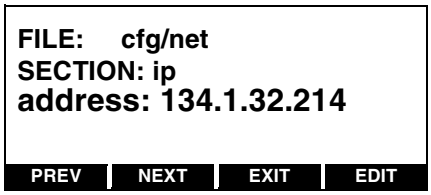
Unreferenced configuration keys are reserved by the application and must not be changed[8].

**Setting up Network Parameters**

From the System Menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/net".


– Press the **EDIT** key. The section menu will show "ip".


– Press the **NEXT** key until the address menu shows "address", then press the **EDIT** key.

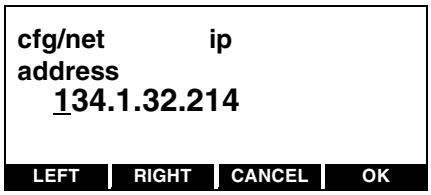



You can now edit the IP address of your SAGEM SA MorphoAccess™.

The **LEFT** and **RIGHT** keys move the cursor. The alphanumeric keys enter digits as necessary. The # key deletes the digit immediately to the left of the cursor. The **EXIT** key aborts editing and restores the previous address value.

[8] For default values, see appendix 4.

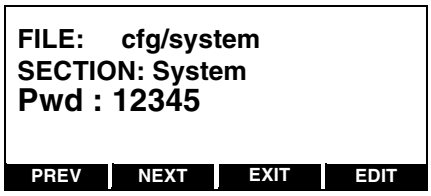
When finished editing, press the **OK** key to update the address field and return to the previous screen.




The IP subnet mask and IP default gateway are set up in the same way. Contact your network Administrator for these values.

**Setting up the System Administrator Pin**

From the Set up menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/ system".




Press the **EDIT** key. The section menu will show "System". Press the **EDIT** key again to show "Pwd". You can now edit the password key to get access to system menu. The default value is "12345".

The **LEFT** and **RIGHT** keys move the cursor and the # key deletes the digit immediately to the left of the cursor. The **CANCEL** key aborts editing and restores the previous password value.

### Setting up the MorphoAccess™ Administrator Pin

From the Set up menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/ Maccess".


Press the **EDIT** key. The section menu will show "Admin". Press the **EDIT** key again to show "PwdAdmin". You can now edit the password key to get access to system menu. The default value is "12345".

The **PREV** and **NEXT** keys move the cursor and the # key deletes the digit immediately to the left of the cursor. The **CANCEL** key aborts editing and restores the previous password value.

### Setting up Host Communication[9]

This mode allows management of a local database within the MorphoAccess™. The default value of **Host Com** key is 3 (MMS).

In this case, the biometric management is between terminal and MorphoAccess™ Management System (MMS). To configure the MorphoAccess™ terminal to manage the local database, this default value must be changed to 0.

From the System Menu, press the **CONFIG** key to access the configuration files.

[9] With MorphoAccess™ 300, the stand alone mode is disabled. Nevertheless, the key value must be set to 0 to enable MMS connection.

Press **NEXT** key until the file shows "/cfg/Maccess". Press the **EDIT** key to select "Admin" section.


Press **EDIT** key and **NEXT** key to select the "Host Com" value.


You can now edit the value. The **LEFT** and **RIGHT** keys move the cursor. The numeric keys enter digits as necessary. The alphanumeric **#** key deletes the digit immediately to the left of the cursor. The **EXIT** key aborts editing and restores the previous value.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Host Com | 0 | Stand alone |
| | 1 | Connected through COM1 |
| | 2 | Connected through COM2 |
| | 3 (default value) | Connected through ETH-ERNET |

You cannot use the stand alone mode to manage your local database if the MorphoAccess™ biometric data is managed by the MMS.

The MorphoAccess™ shall be used either in stand alone mode or in connected mode (with MMS) but never in both modes.

Configuring the key to 0 will disable MMS connection.

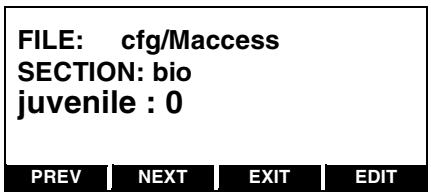
**Setting up juvenile recognition**

Since software release 2.0, the MorphoAccess™ is able to manage both juvenile and adult finger images.

From the System Menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/ Maccess".


Press the **EDIT** key. Press the **NEXT** key until the section menu shows "bio".


Press the **EDIT** key. You can edit the juvenile parameters to activate juvenile recognition.



This provides a solution with reliable performance to the automatic processing of finger images with small to normal ridges, extending the capability of the terminal by providing access control to a wider range of population.

Since the encoding time is a little bit longer when the juvenile option is turned on, we offer the possibility to the user set up the terminal either in "Juvenile" mode or in standard mode.

When the juvenile mode is turned on, key set to 1, young children can easily be enrolled in the MorphoAccess™.

**Setting up anti-latency**

The anti-latency processing consists to detect marks left on the sensor. In some extreme conditions it is possible that a mark left on the sensor triggers an identification or verification.

From the 4.4 release of MorphoAccess firmware it is now possible to detect marks left on the sensor.

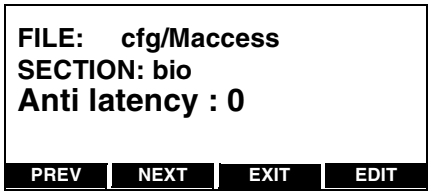
When the MorphoAccess detects a mark the identification is stopped and the application loops back and look for a new fingerprint.

With regards to the previous releases of the MA application the main change is that a fingerprint placed two consecutive times on the sensor in the the same position will be rejected from the second attempt.

From the System Menu, press the CONFIG key to access the configuration files. Press the NEXT key until the file menu shows "/cfg/Maccess".

Press the **EDIT** key. Press the **NEXT** key until the section menu shows "bio".


Press the **EDIT** key. You can edit the anti-latency parameters to activate the mode.



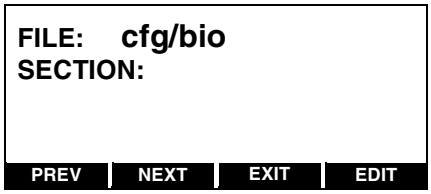

When the anti-latency mode is turned on, key set to **1**, no latent fingerprint marks may be detected by the MorphoAccess™.

**Setting up matching threshold**

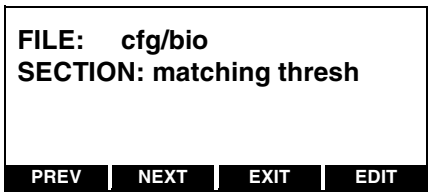
The performances of a biometric system are characterized by two quantities, the False Non Match Rate - FNMR - (Also called Fale Reject Rate) and the False Match Rate - FMR - (Also called False Acceptance Rate). Different trade-off are possible between FNMR and FMR depending on the security level targeted by the access control system. When convenience is the most important factor the FNMR must be low and conversly if security is more important then the FMR has to be minimized.

Different tunning are proposed in the MorphoAccess terminal depending on the security level targeted by the system. The table below details the different possibilities.

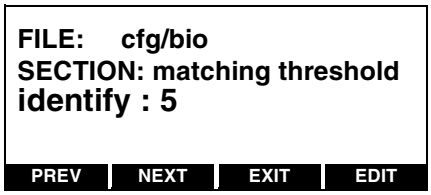
From the System Menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/ bio".

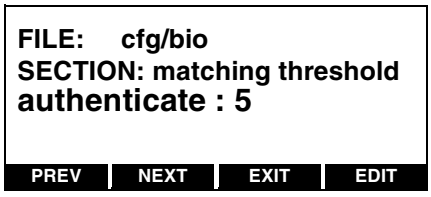



Press the **EDIT** key. Press the **NEXT** key until the section menu shows "matching threshold".




Press the **EDIT** key. You can edit the matching threshold level parameters for identification and authentication using **NEXT** and **EDIT** keys.



You can now edit the format of the value. The **LEFT** and **RIGHT** keys move the cursor. The numeric keys enter digits as necessary. The alphanumeric **#** key deletes the digit immediately to the left of the cursor. The **EXIT** key aborts editing and restores the previous value.
This parameter can be set to values from 0 to 10. This parameter specifies how tight the matching threshold is. Threshold scoring values are identified below.

For example:

| | | |
|---|---|---|
| 0 | Low threshold for test purpose only | There are few rejections, but many recognitions |
| 1 | Very few persons rejected | FAR < 1% |
| 2 | | FAR < 0.3% |
| 3 | | FAR < 0.1% |
| 4 | | FAR < 0.03% |
| 5 | Intermediate threshold (default value) | FAR < 0.01% |
| 6 | | FAR < 0.001% |
| 7 | | FAR < 0.0001% |
| 8 | | FAR < 0.00001% |
| 9 | Very high threshold (few false acceptances) | FAR < 0.0000001% |
| 10 | High threshold for test purpose only | There are very few recognitions, and many rejections |

### Setting up multilingual application

The MorphoAccess™ can operate using other language than English. It can also operate in Spanish and French. It is possible to download a user defined string table. For more information about this feature, refer to the MorphoAccess™ Host System Interface Specification, Ref.: 3000005996.

The default language of the MorphoAccess™ is defined in the /cfg/Maccess/Language/default.

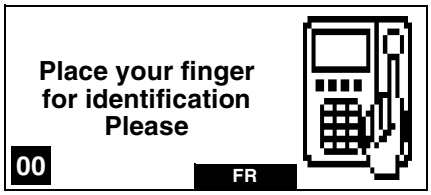
The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Default | 0 (default value) | English |
| | 1 | Spanish |
| | 2 | French |
| | 3 | User defined language |

### Setting up user interface

*Language*

A user may choose his language by pressing a button. The language choice is circular. This feature can be enabled and disabled with key /cfg/Maccess/Language/change.




Those configuration keys can be defined from the **CONFIG** menu in file /cfg/Maccess, in section Language.

| Parameters | Value | Comment |
|---|---|---|
| Change | 0 (default value) | The change language button is disable. Users cannot change their language. |
| | 1 | Users can choose their language using the change language button. |

*Identification information*

On a positive identification, it is possible to display an information about the identified user. This information should be present in the additional fields of its record.

Those configuration keys can be defined from the **CONFIG** menu in file /cfg/Maccess, in section GVI.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Welcome field 1/2 | 0 (default value) | System displays ID of identified person. |
| | X | System displays data present in additional field number X of identified person. |

Example: First and second additional field have been selected. They contain first and family name of all records present in the database. On identification, system will display the following screen:


This feature needs a database containing the appropriate additional fields.

*Clock*

When using time mask feature, users may find useful to synchronise with their MorphoAccess™. A clock can be displayed.


Time is displayed in the 24 hours format.

Related configuration key can be defined from the **CONFIG** menu in file /cfg/GUI, in section Display hour.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Display hour | 0 (default value) | Clock is not displayed. |
| | 1 | Clock is displayed and refreshes every minute. |

*Idle mode*

In identification mode it is possible to switch the MorphoAccess™ in idle mode in order to shut down sensor red light and green screen back light. Pressing a key wakes the MorphoAccess™ up.

Related configuration key can be defined from the **CONFIG** menu in file /cfg/GUI, in section Idle time in min.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Idle time in min. | 0 (default value) | MorphoAccess™ never enters idle mode. |
| | n | MorphoAccess™ enters idle mode after n minutes. |

**Setting up contactless reader parameters (MorphoAccess™ 220 only)**

A MIFARE card is defined by a unique serial number. The card is divided in 16 sectors. Each sector is divided in 4 blocks. Each block contains 16 bytes of data. Data are encoded with two sets of key. To be able to read a card, the reader should use the same key set. Fourth blocks cannot be read, they are used to store key sets.

Data can be accessed by blocks as follows:

| | *Block 0* | *Block 1* | *Block 2* | *Block 3* |
|---|---|---|---|---|
| *Sector 0* | Block 1 | Block 2 | Block 3 | |
| *Sector 1* | Block 4 | Block 5 | Block 6 | |
| *...* | | | | |
| *Sector 15* | Block 46 | Block 47 | Block 48 | |

Blocks are numbered in an absolute way, 1 for block 0 sector 0, then 3 blocks for each sector.

SAGEM SA biometric data (ID, name and templates) are located on the card thanks to a BNC address where:

<B> is the first block number to read,

<N> is the number of blocks to read,

<C> selects a security key.

For more information about SAGEM SA biometric data, please contact SAGEM SA or refer to document 3000005996 MorphoAccess™ Host System Interface Specification.

With a MorphoAccess™ 220, contactless parameters can be defined from the CONFIG menu in file /cfg/Maccess, in section Contactless.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Reader Type | 0<br>1<br>2 (default value) | No MIFARE reader is used.<br>External MIFARE Deister reader is used.<br>Internal MIFARE reader is used. |
| B | 4 (default value) to 13 | First block number to read. |
| N | 2 or 25 | Number of blocks to read.<br>2 when an ID is stored.<br>25 when templates are stored. |
| C | 2 (default value) | MIFARE security key A is selected.<br>MIFARE security key B is selected. |

**Setting up log file**

The MorphoAccess™ can log its biometric activities. It stores the result of the command, the date and time, the matching mark, the execution time, and the ID of the user.

Those configuration keys can be defined from the **CONFIG** menu in file /cfg/Maccess, in section Admin.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Log File | 0 (default value) | MorphoAccess™ is not logging its activities. |
| | 1 | MorphoAccess™ is logging its activities. |

It is possible to upload the log file. For more information about this feature, refer to the MorphoAccess™ Host System Interface Specification, Ref.: 3000005996.

**Setting up time mask**

When using MMS commands, a time mask feature is available. This mode enables the access according to its time mask. Time mask is defined by slots of 15 minutes over a week. For more information, see MorphoAccess™ Host System Interface Specification Ref.: 3000005996.

Those configuration keys can be defined from the **CONFIG** menu in file /cfg/Maccess, in section Admin.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Time mask | 0 (default value) | Time mask feature is disable. |
| | 1 | Time mask feature is enabled. Users must be on time to have their access granted. |

### Setting up download agent

In order to upgrade the MorphoAccess™ terminal to future versions, a download agent is running. This agent allows connecting to the terminal and proceeding maintenance operations. For more information about the protocol used to communicate with this agent, please contact your SAGEM SA sales representative.

Those configuration keys can be defined from the **CONFIG** menu in file /cfg/sdl, in section download.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Active | 0 | Agent is disabled. |
| | 1 (default value) | Agent is enabled. |
| Ratif | 3 (default value) | Number of failed attempts before deactivating the agent. |
| Password | 12345678 (default value) | Password to present in order to connect the agent. |

### Setting up Wiegand/Dataclock ouput

You can use the output Wiegand[10] or Dataclock to send the corresponding ID to the central security controller. Wiegand ports are configured in 26-bit format and output port Dataclock is compatible with ISO track 2 data formats.

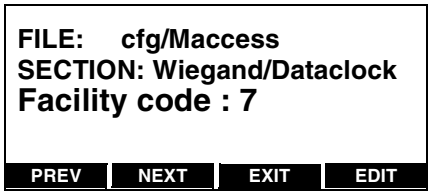
Using Wiegand, ID is sent in binary format. Using Dataclock, Id is sent in BCD[11] format[12].

From the System Menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/Maccess".

[10] Refer to the previous chapter to configure the terminal with desired output.
[11] BCD: Binary Code Decimal.
[12] For more information, see appendices 2 and 3.

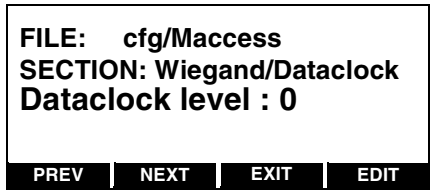

Press the **EDIT** key. Press the **NEXT** key until the section menu shows "Wiegand/Dataclock".


Press the **EDIT** key. You can edit the Wiegand/Dataclock parameters using **NEXT** and **EDIT** keys.
To configure the facility code in Wiegand[13] mode, you must select the facility code key in section Wiegand/Dataclock.




You can now edit the value. The **LEFT** and **RIGHT** keys move the cursor.The numeric keys enter digits as necessary. The alphanumeric **#** key deletes the digit immediately to the left of the cursor. The **EXIT** key aborts editing and restores the previous value.
To configure the Data and Strobe levels in **Dataclock**[14] mode, you must select the Dataclock level key in section Wiegand/Dataclock.

[13]For more information, see appendix 2
[14]Idem.



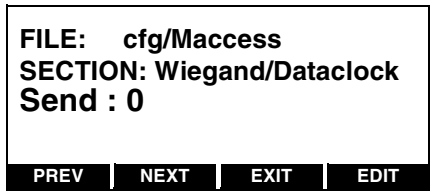

You can now edit the value. The **LEFT** and **RIGHT** keys move the cursor.

The numeric keys enter digits as necessary. The alphanumeric **#** key deletes the digit immediately to the left of the cursor. The **EXIT** key aborts editing and restores the previous value.

| Parameters | Value | Comment |
|---|---|---|
| Dataclock level | 0 (default value) | Data and strobe are not inverted. |
| | 1 | Strobe is inverted. |
| | 2 | Data is inverted. |
| | 3 | Data and strobe are inverted. |

When finished editing, press **OK** key to update the format value and return to the previous screen.

To activate/deactivate the output port, you must select the **SEND** key in section Wiegand/Dataclock.




You can now edit the value. The LEFT and RIGHT keys move the cursor.

The numeric keys enter digits as necessary. The alphanumeric # key deletes the digit immediately to the left of the cursor. The EXIT key aborts editing and restores the previous value.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Send | 0 | The output is not activated. |
| | 1 (default value) | The output is activated. |

When finished editing, press OK key to update the value and return to the previous screen.

To configure the behaviour of LED IN and LED OUT signals, go to the **CONFIG** menu in file /cfg/Maccess, in section Wiegand/Dataclock.


You can now edit the value. The LEFT and RIGHT keys move the cursor.

The numeric keys enter digits as necessary. The alphanumeric # key deletes the digit immediately to the left of the cursor. The EXIT key aborts editing and restores the previous value.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Level out/Card present | 0 (default value) | Autodetect<br>The led out signal can behave as a card present signal depending on the hardware configuration of the system:<br>– DataClock IN/ **DataClock OUT**: Card present |

| Parameters | Value | Comment |
|---|---|---|
| | | – **Wiegand IN/ DataClock OUT**: card present (priority goes to dataclock out)<br>– **Wiegand IN**/ Wiegand OUT: led out<br>– DataClock IN/ Wiegand OUT: inactive |
| Led out/Card present (con't) | 1 | Force Led out<br>The led out signal only behaves as a led out signal. |
| Led in | 0 (default value)<br><br>1 | Active<br>The led in signal is ignored.<br><br>Inactive<br>The MorphoAccess™ led is driven by the led in signal:<br>led in = 0 =>led is green<br>led in = 1 => led is off |

**Setting up Ethernet Link parameters**

You can use the Ethernet port to send the corresponding ID to the central security controller. Connection should be made using port 11020.

Those configuration keys can be defined from the **CONFIG** menu in file /cfg/Maccess, in section Ethernet.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Send | 0 (default value)<br>1 | ID is not sent.<br>ID is sent through the Ethernet port. |
| IP | aaa.bbb.ccc.ddd | IP of the central security controller. |

**Setting up Serial Link Parameters**

You can use the serial port[15] to send the corresponding ID to the central security controller. You can use COM1 or COM2 or both.

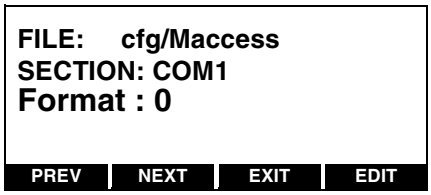
***Setting up COM1 port***

From the System Menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/ Maccess".


Press the **EDIT** key. Press the **NEXT** key until the COM1 menu shows "COM1".

[15]One RS422 port (full duplex, four wires) or one RS232 port.


Press the **EDIT** key. You can now edit the format parameters to select the output format of the ID.




You can now edit the format of the ID. The **LEFT** and **RIGHT** keys move the cursor. The numeric keys enter digits as necessary. The alphanumeric **#** key deletes the digit immediately to the left of the cursor.

The **EXIT** key aborts editing and restores the previous value.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Format | 0 (default value) | The ID is sent in ASCII format. |
| | 1 | The ID is sent in Hexa format. |
| | 2 | The ID is sent in BCD(13) format. |

When finished editing, press **OK** key to update the format of the ID and return to the previous screen.


To activate or deactivate the COM1 port, you must select the **SEND** key in section COM1.

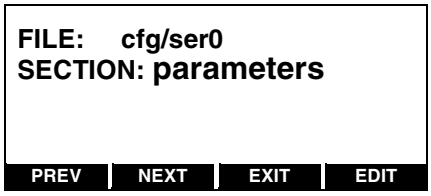
The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Send | 0 (default value) | The COM1 output is not activated. |
| | 1 | The output COM1 is activated. |

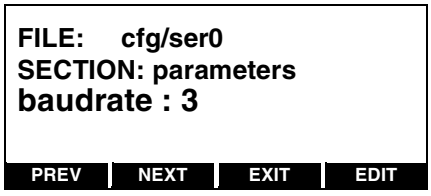
ID transmission on port COM1 is disabled when ILV communication is activated with key /cfg/Maccess/Admin/Host Com set to **1**.

To configure the COM1 serial link, press the **CONFIG** key from the System Menu. Press the **NEXT** key until the file menu shows "/cfg/ser0" and select parameters section.

Press the **EDIT** key. The section menu will show "parameters".




Press the **EDIT** key. You can edit the baudrate value to select the transmission speed.

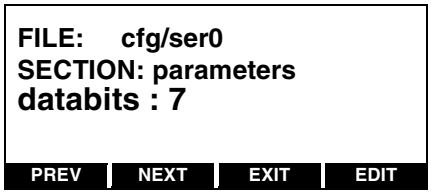



You can now modify the baudrate value of COM1 port. The **LEFT** and **RIGHT** keys move the cursor. The numeric keys enter digits as necessary. The alphanumeric **#** key deletes the digit immediately to the left of the cursor. The **EXIT** key aborts editing and restores the previous baudrate value.

| Parameters | Value | Comment |
|---|---|---|
| Baudrate (bits/second) | 0 | 1200 |
| | 1 | 2400 |
| | 2 | 4800 |
| | 3 (default value) | 9600 |
| | 4 | 19200 |
| | 5 | 28800 |
| | 6 | 38400 |
| | 7 | 57600 |
| | 8 | 115200 |

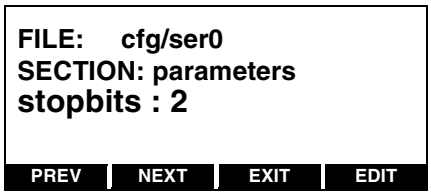
When finished editing, press **OK** key to update the baudrate field and return to the previous screen.

To configure the next parameters (databits, parity and control flow), select the **NEXT** key to select the other value and follow the previous descriptions to modify the values.




You can edit the databits parameters. The different values are:

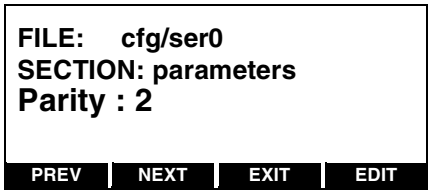
| Parameters | Value | Comment |
|---|---|---|
| Databits | 5 | 5 |
| | 6 | 6 |
| | 7 (default value) | 7 |
| | 8 | 8 |



You can edit the stopbits parameter, the allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Stopbits | 1 | 1 |
| | 2 (default value) | 2 |

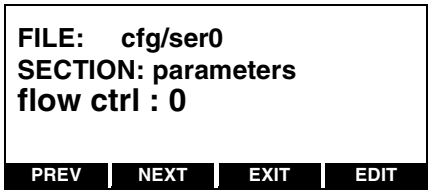



You can edit the parity parameter.

The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Parity | 0 | No |
| | 1 | Odd |
| | 2 (default value) | Even |

You can edit the control flow parameter.




The allowed values are:

| Parameters | Value | Comment |
|---|---|---|
| Flow Ctrl Type | 0 (default value) | No |
| | 2 | Xon/Xoff |

When using the Deister contacless card reader, COM1 parameters should be:

| | |
|---|---|
| Baudrate | 3 (9600) |
| Databits | 8 |
| Stopbits | 1 |
| Parity | 0 |
| Flow ctrl | 0 |

***Setting up COM2 port***

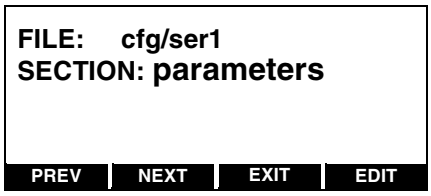
To activate this port, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/Maccess". Press the **EDIT** key, and select the RS232 section.


The values are:

| Parameters | Value | Comment |
|---|---|---|
| Send | 0 (default value) | The RS232 output is not activated. |
| | 1 | The RS232 output is activated. |
| Format | 0 (default value) | The ID is sent in ASCII format. |
| | 1 | The ID is sent in Hexa format. |
| | 2 | The ID is sent is BCD(1) format. |

(1) BCD: Binary Code Decimal

The following table describes the parameters for the serial link configuration. Press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/ser1" and select parameters section.




ID transmission on port COM2 is disabled when ILV communication is activated with the key /cfg/Maccess/Admin/Host Com set to **2**.

The values are described below:

| Parameters | Value | Comment |
|---|---|---|
| Baudrate | 0 | 1200 bit/second |
| | 1 | 2400 bit/second |
| | 2 | 4800 bit/second |
| | 3 (default value) | 9600 bit/second |
| | 4 | 19200 bit/second |
| | 5 | 28800 bit/second |
| | 6 | 38400 bit/second |
| | 7 | 57600 bit/second |
| | 8 | 115200 bit/second |
| Data bits | 5 | 5 |
| | 6 | 6 |
| | 7 (default value) | 7 |
| | 8 | 8 |
| Stop bits | 1 | 1 |
| | 2 | 2 |

| Parameters | Value | Comment |
|---|---|---|
| Parity | 0 | No |
| | 1 | Odd |
| | 2 (default value) | Even |
| Flow control type | 0 (default value)I | No |
| | 1 | Hardware (CTS/RTS) |
| | 2 | Software (XON/XOFF) |

**Setting up Relay Parameters**

It is possible to configure the release time of the relay. For this, from the System Menu, press the **CONFIG** key to access the configuration files. Press the **NEXT** key until the file menu shows "/cfg/Maccess".

Press the **EDIT** key, and press **NEXT** key to select the Relay section.

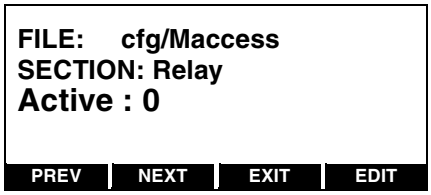

Press the **EDIT** key. You can edit the release time value by 100 ms steps.


You can now modify the release time value by pressing the **EDIT** key.

The **LEFT** and **RIGHT** keys move the cursor. The numeric keys enter digits as necessary. The alphanumeric **#** key deletes the digit immediately to the left of the cursor. The EXIT key aborts editing and restores the previous value.

When finished editing, press the **OK** key to update the release time field and return to the previous screen.

To configure the next parameter, select the **NEXT** key. You can edit the "active" value.




The different values are:

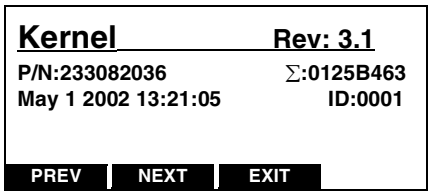
| Parameters | Value | Comment |
|---|---|---|
| Active | 0 (default value) | Relay not active. |
| | 2 | Relay active. |

## The VERSION menu

### Information Display

From the System Menu, press the **VERSION** key to access the information file.

This display contains information that may be necessary if the SAGEM SA MorphoAccess™ requires technical support. It should not normally be necessary to access this display unless requested by SAGEM SA technical support personnel.




**Kernel** is the name of the module being displayed.

**Rev** is the revision of the module.

**P/N** is the part number for the module.

∑ is the checksum for the module.

The next line shows the date of the module's creation.

**ID** is the ID for the module in the system.

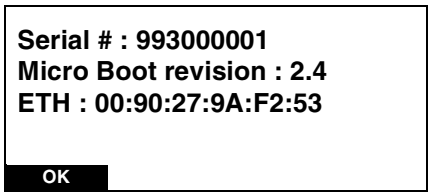
The **PREV** and **NEXT** buttons allow you to browse for all modules present in your SAGEM SA MorphoAccess™.

**EXIT** returns to main menu.

## The SERIAL NUMBER menu

**Serial Number Display**

From the System Menu, press the **SER NB** key to display the serial number.




**Serial #** is your SAGEM SA MorphoAccess™'s serial number.

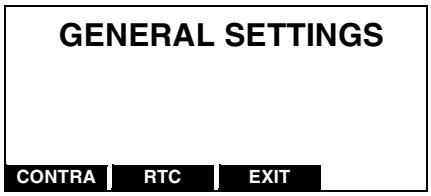
**MicroBoot revision** is the revision number of your SAGEM SA MorphoAccess™'s MicroBoot. This revision number may be needed when requesting technical support.

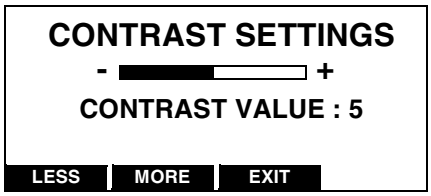
**ETH** is the physical Ethernet address, also known as the MAC address. This address may be required by your network Administrator.

## The SETTING menu

### Parameters Setting

From the System Menu, press the **SETTING** key to access the parameter settings.

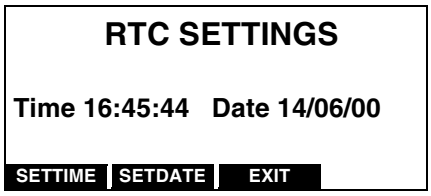



The **CONTRA** selection allows you to adjust the contrast of the LCD display.

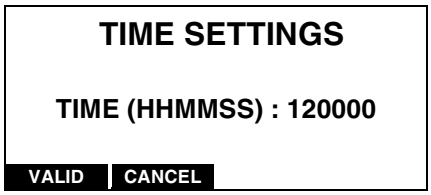
The **MORE** key increases the contrast, the **LESS** key decreases the contrast.

The **RTC** menu allows you to set the current date and time.



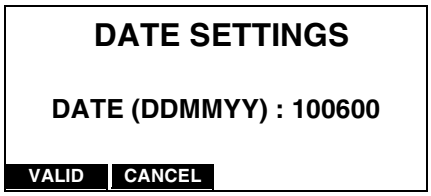

  

The **SETTIME** key allows you to set the time. Enter the time in the following format: HHMMSS. The **VALID** key records your setting. The **CANCEL** key aborts editing and returns to the previous menu.




The **SETDATE** key allows you to set the current date. Enter the date in the following format: DDMMYY. The **VALID** key records your setting.

The **CANCEL** key aborts editing and returns to the previous menu.




***Note :*** You can use the correction key # to delete the last characters entered.

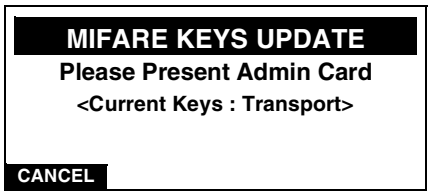
## Access the MIFARE keys update menu (MorphoAccess™ 220)

Each data sector on a MIFARE card is protected in reading and writing by 2 keys of 6 bytes each. These keys are noted A and B. Since the card is composed of 16 sectors, there are actually 32 keys.

When you present a MIFARE card to the MorphoAccess for an authentication, data can be read only if the keys which protect it are the same as the keys initialized into the reader. By default both keys A and B are set to 0xFFFFFF for the 16 sectors in the MIFARE module of the MorphoAccess. These default values are called *Transport keys*.

You can change the value of the keys thanks to the hotkey **CL KEYS** in the Administrator menu(16). You will need for that an administrator card containing the new keys to initialize. Please check the Enrollment Station documentation to know how to create an administrator card.

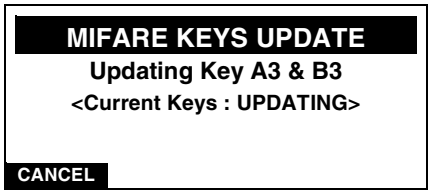
While you are in the administrator menu, press the key **CL KEYS**. The **MIFARE KEYS UPDATE** screen appears.



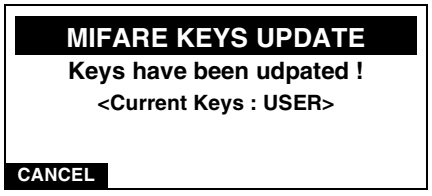

Present the administrator card to start the update.

(16) If you perform this operation, the old user cards won't be readable anymore, since the keys won't be compliant anymore.

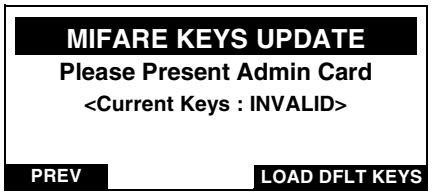
  




When the MorphoAccess™ finishes to update the keys for the 16 sectors, a successful message appears. The keys status indicates now "user" keys, meaning keys different from 0xFFFFFF have been loaded into the reader. Then the MorphoAccess™ comes back to the administrator menu after 2 seconds.




If for some reasons the update is not successful (power shutdown before the end of the operation for instance), a new hotkey will be available the next time you will enter in the **CL KEYS** menu. The keys status will indicate "INVALID" keys.




Pressing the **LOAD DFLT KEYS** hotkey will allow you to re-update the 32 keys with the default value 0xFFFFFF.

# Communication protocol

The communication protocol available allows the terminal to send commands to a host through the communication COM1/RS485.

All the commands will be formatted with an "Identifier Length Value" structure as described below:

| Identifier | Length | Value |
|---|---|---|

**Identifier** called **I** This is the identifier of the command.

**Length** called **L** This is the length of the Value field in bytes.

**Value** called **V** The parameters or data.

The commands will be encapsulated in a packet structure described on the next figure.

| STX | ID | RC | ILV | **CRC** | DLE | ETX |
|---|---|---|---|---|---|---|

**CRC** : Compliance CRC16 V41

| Fields name | Definition | Value |
|---|---|---|
| <STX> | Start Text | 0x02 |
| <ID> | Packet Identifier | 0xE1 |
| <RC> | Request Counter | Unused byte |
| <ILV> | Identifier Length Data (DLE data bytes arestuffed) | I:<br>0x00 for ASCII<br>0x01 for Hexa<br>0x02 for BCD<br>L: 2 bytes<br>V: Value of identifier |
| <CRC> | Transmission error control | Depends on the frame |
| <DLE> | | 0x1B |
| <ETX> | End Text | 0x03 |

# Appendix 1 - Wiegand data format

The 26 bits of transmission consists of two parity bits and 24 code bits. The eight first code bits are encoding the facility code. This code identifies each Morphoccess in a network. The 16 other bits are data bits. The first bit transmitted is the first parity bit. It is even parity calculated over the first 12 bits. The last bit transmitted is the second parity bit. It is odd parity bit calculated over the last 12 code bits.

| Even parity (1 bit) | Facility code (8 bits) | Data (16 bits) | Odd parity (1 bit) |
|---|---|---|---|

Compliant with access control 26-Bit - Wiegand reader interface standard 03/1995.

# Appendix 2 - ISO 7811/2-1995 - Track 2 Data clock format

Compliant with ISO07811/2-1995 - Track 2.

**Data encoding table**

| Value | Bit pattern | Meaning |
|---|---|---|
| 0 | 0 0 0 0-1 | "0" |
| 1 | 1 0 0 0-0 | "1" |
| 2 | 0 1 0 0-0 | "2" |
| 3 | 1 1 0 0-1 | "3" |
| 4 | 0 0 1 0-0 | "4" |
| 5 | 1 0 1 0-1 | "5" |
| 6 | 0 1 1 0-1 | "6" |
| 7 | 1 1 1 0-0 | "7" |
| 8 | 0 0 0 1-0 | "8" |
| 9 | 1 0 0 1-1 | "9" |
| 10 ($A_{hex}$) | 0 1 0 1-1 | unused character |
| 11 ($B_{hex}$) | 1 1 0 1-0 | start sentinel (start character) |
| 12 ($C_{hex}$) | 0 0 1 1-1 | unused character |
| 13 ($D_{hex}$) | 1 0 1 1-0 | field separator |
| 14 ($E_{hex}$) | 0 1 1 1-0 | unused character |
| 15 ($F_{hex}$) | 1 1 1 1-1 | end sentinel (stop character) |

The least significant bit of every digit is sent first; the fifth bit is an odd parity bit for each group of four data bits.

The complete message always looks as follows:

| left edge | start | data characters | end | LRC | right edge |
|---|---|---|---|---|---|

The LRC is calculated by the following procedure: each of the 4 bits in the LRC character is an even parity bit of the equivalent bits in the telegram including start and stop sentinel.

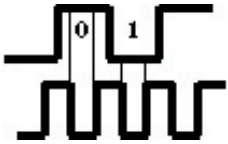
The fifth bit is the odd parity of the four LRC bits (it is not calculated over all the parity bits).

**Data clock levels**

In normal operation mode (default) in and out signals are defined as:

data

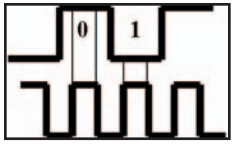
strobe




Other modes are (only for output):

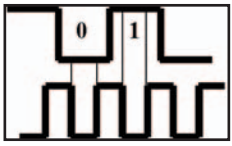
data

inverted strobe



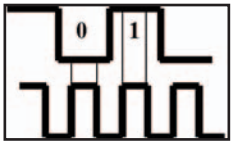

inverted data

strobe




inverted data

inverted strobe



# Appendix 3 - Reserved configuration values

These values are for internal use only.
For proper operation, these settings should not be changed.

/cfg/lcd0/display/type : 1
/cfg/lcd0/contrast/value : 0

/cfg/ser0/mode/connection: EXT
/cfg/ser0/mode/mode: 450

db/seq flash/start: 0

/cfg/bio/video/channel: 0
/cfg/bio/video/rotation: 0

/cfg/lic/licences/*

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