Sagem Défense Sécurité
Groupe SAFRAN

MORPHOACCESS™

Installation Guide
MA1xx series

MorphoAccess™ 100/110/120

November 2005

SK 0000034370 - 01

CONTENTS

INTRODUCTION

Congratulations for choosing the SAGEM MorphoAccess™[1] Automatic Fingerprint Recognition Terminal. MorphoAccess™ provides an innovative and effective solution for access control applications using Fingerprint Verification or/ and 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 more than 20 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 SAGEM MorphoAccess™ fast, accurate, easy to use and suitable for physical access control.

The SAGEM MorphoAccess™ offers the following advantages:

- High quality optical sensor.
- Supports multiple input/output interfaces used in the physical access control industry.
- Local area network interface for easy interaction with other host systems.
- Very compact size for easy installation and integration into your available office space.
- Open architecture, with dedicated applications implemented via MA1xx Software Development Kit.

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

[1] The SAGEM logo and trademark are the property of *SAGEM Défense Sécurité*.

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SAFETY INSTRUCTIONS

The installation of this product should be made by a qualified service Person and should conform to all local codes.

It is strongly recommended to use a class II power supply at 12 V ±5% and 0.5 A. min according with Safety Electrical Low Voltage (SELV). The 12 V power supply cable length should not exceed 5 meters.

This product is intended to be installed with a power supply conformed to EN60950, in accordance with the NEC Class 2 requirements ; or supplied by a listed EN60950 external Power Unit marked Class 2 , Limited Power source, or LPS and rated 12 V DC, 0.5 A minimum.

In case of building to building connection it is recommended to connect 0V to ground. Ground cable must be connected with the terminal block 0V GND.

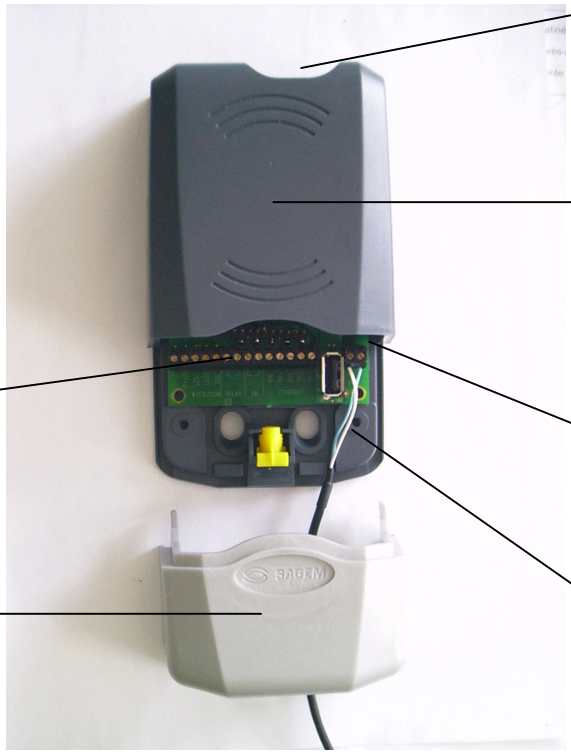
Europe information's : SAGEM hereby declares that the SAGEM MorphoAccess™ has been tested and found compliant with the below listed standards as required by the EMC Directive 89/336/EEC: EN55022 (1994) / EN55024 (1998) , EN300-330 (1999) and by the low voltage Directive 73/23/EEC amended by 93/68/EEC: EN60950 (2000).

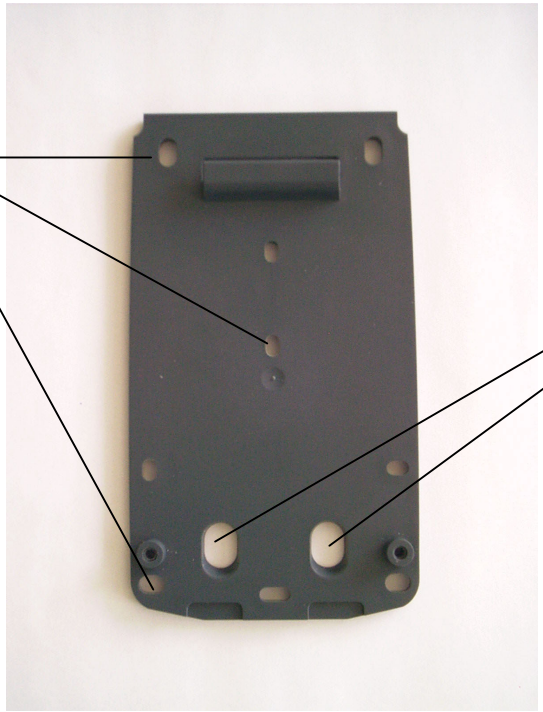
USA information's : This equipment has been tested and found compliant with Class B digital device requirements, pursuant to part 15 of the FCC Rules. These requirements are designed to ensure reasonable protection against harmful RF interference in a residential installation.

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.

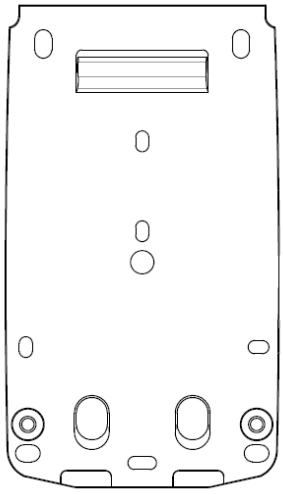
GENERAL DESCRIPTION

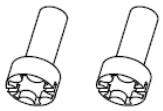
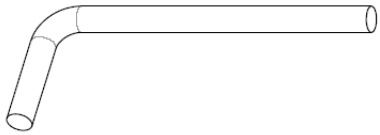




MorphoAccess™ supplies :

1 Cover assembly
1 Trap door
1 secured screwdriver Torx 20
1 Chassis
2 screws for cover fixation
1 secured screw for trap door fixation

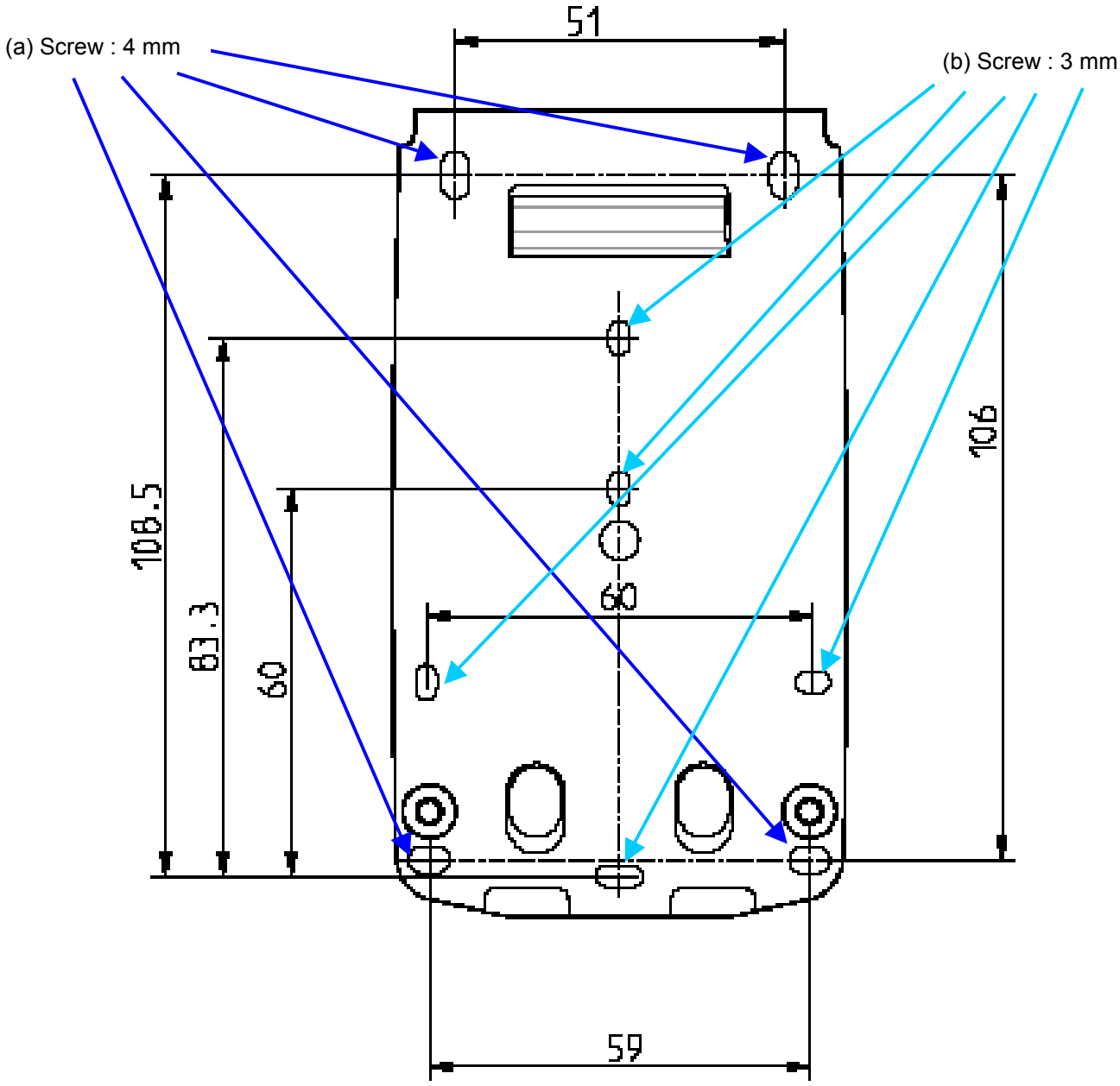
Qty		
1	Cover assembly	
1	Chassis	

1	Trap door	
2	Screws for cover fixation into the chassis.	
1	Secured screw for trap door fixation	
1	Secured screwdriver Torx 20	

In order to proceed to MorphoAccess installation , you'll need a standard 2,5mm screwdriver.

INSTALLATION PROCEDURE

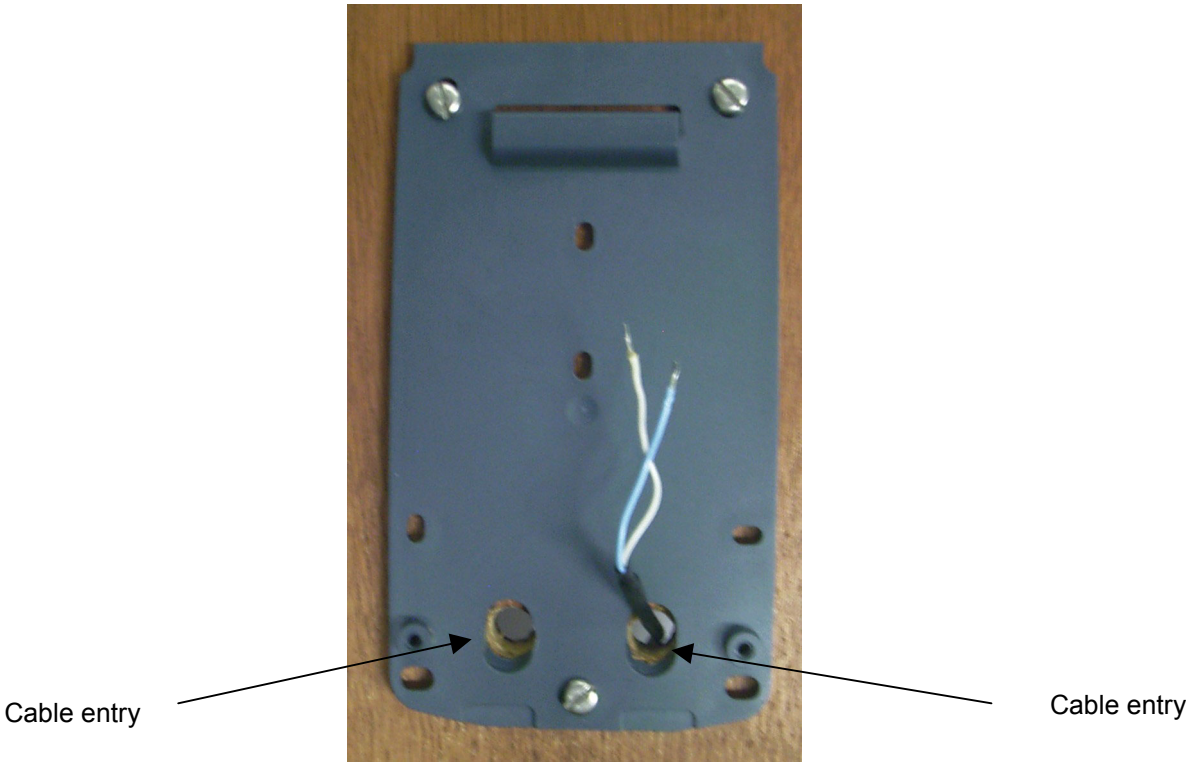
Stage 1 : Drilling the chassis mounting holes



I. For choice, drill the 4 corners holes (a) for the screws for the mounting keyholes so that the cable entry is in a suitable position for your cabling, using the dimensional drawing above.

II. In case of electric plug connections , MorphoAccess™ terminal may be installed directly on US or European plugs , with some of the 5 holes (b). So, drill the needed holes.

Stage 2 : Cable entry hole location and chassis fixation



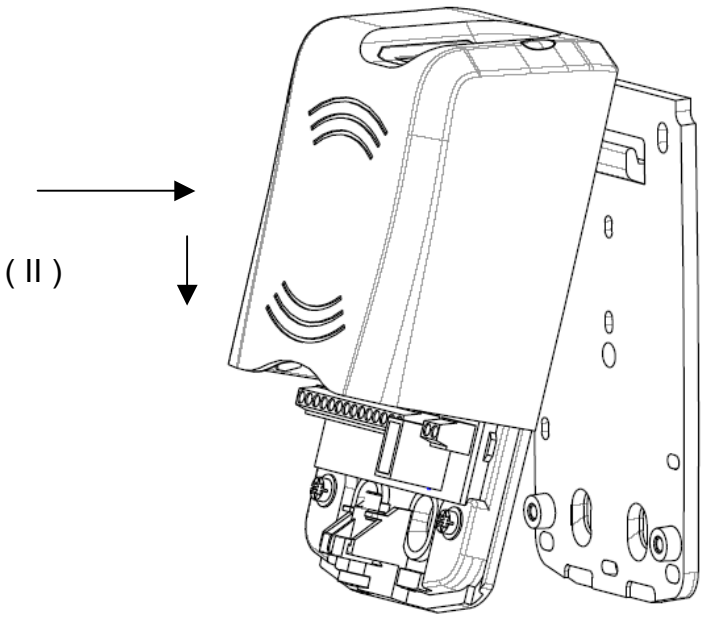
I. Pass the all connecting cables through the 2 cable entry. Be sure during manipulation that power supply from electric source is off.

II. Fit the screws chassis fixation.

The mounting screws must be 4 mm diameter maximum for corner place (a) and 3 mm diameter maximum for other places (b).

Small head screws are required.

Stage 3 : Connecting the cover assembly to the chassis



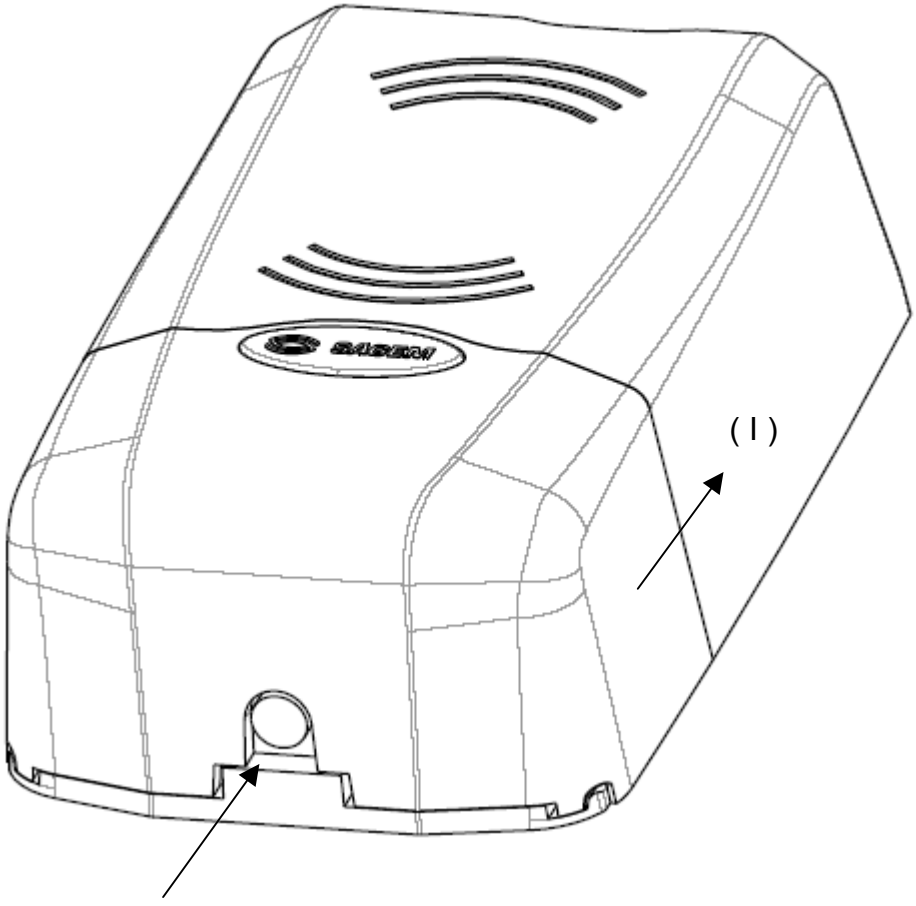
I. Pass all connecting cable into cover entry holes.

II. Put the cover assembly into the chassis hanging

III. Fit the 2 screws chassis fixation , supplied with MorphoAccess™

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

Stage 4: Closing MorphoAccess™

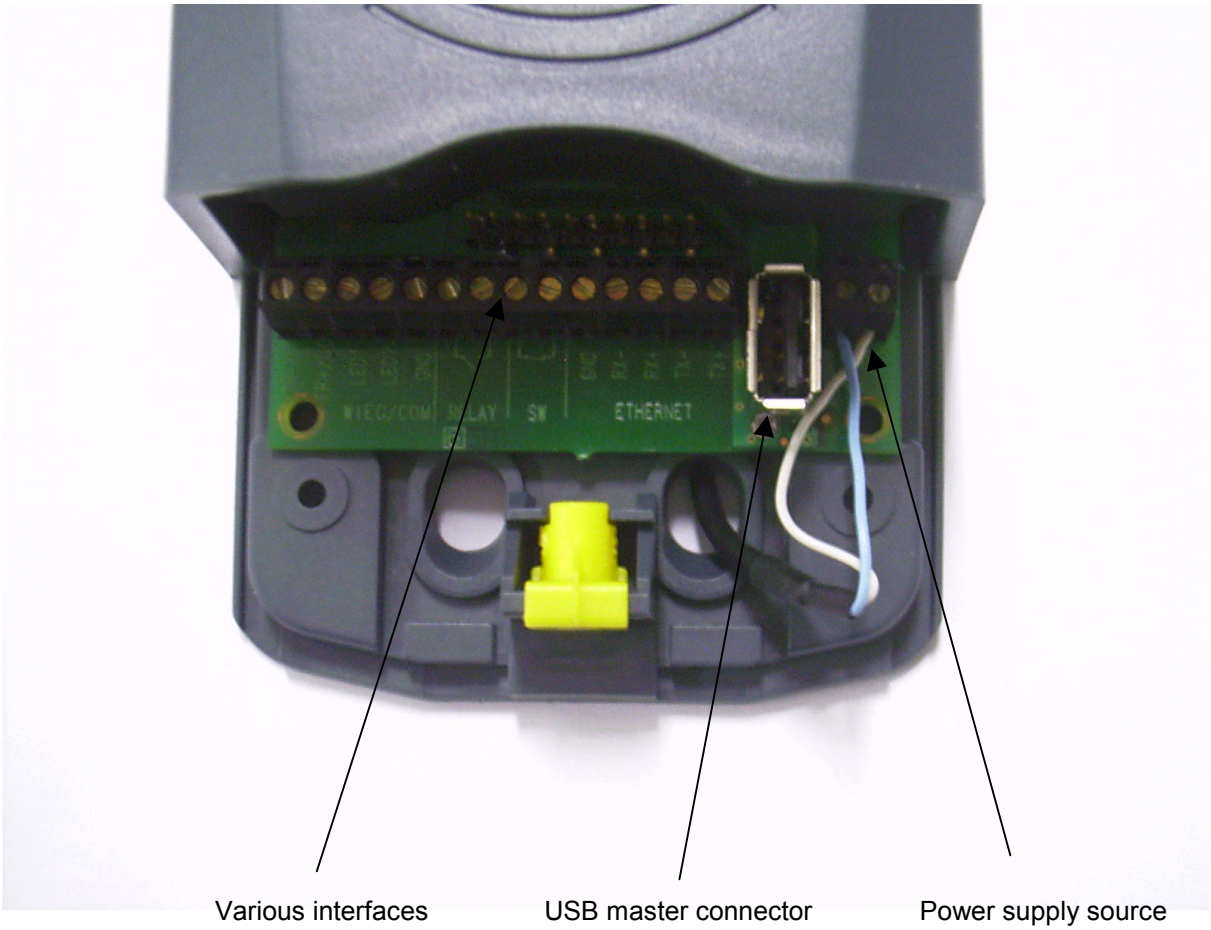


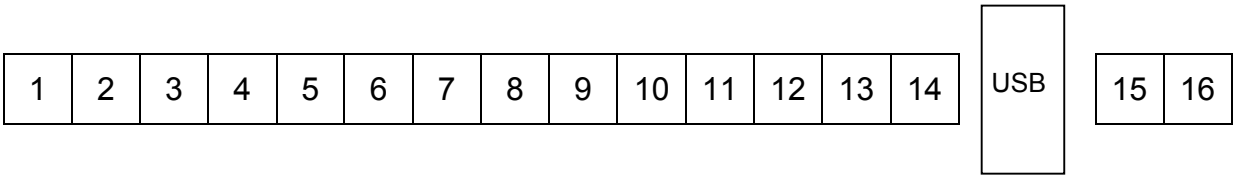
I. Push up the trap door along the cover assembly

II. Fit the M4x20 assembly secured screw (use screwdriver Torx 20S supplied with MorphoAccess™)

ELECTRICAL INTERFACE

Terminal block board wiring





Pin 1	TR- / D1	Out	Wiegand D1 or RS485 TX/RX- or CLK
Pin 2	TR+ / D0	Out	Wiegand D0 or RS485 TX/RX+ or Data
Pin 3	LED1	In	Wiegand LED1
Pin 4	LED2	In	Wiegand LED2
Pin 5	GND		Ground for Wiegand / RS485 / Dataclock
Pin 6	Relay C0		Contact Relay 0
Pin 7	Relay C1		Contact Relay 1
Pin 8	TSW0		Tamper switch Contact 0
Pin 9	TSW1		Tamper switch Contact 1
Pin 10	GND		Ground for Ethernet Interface (LAN 10/100 Mbps)
Pin 11	RX-		Receive negative Ethernet
Pin 12	RX+		Receive positive Ethernet
Pin 13	TX-		Transmit negative Ethernet
Pin 14	TX+		Transmit positive Ethernet
Pin 15	+12V		Positive 12 Volts , power supply.
Pin 16	GND		Ground power supply.

Power supply cable

1	2	3	4	5	6	7	8	9	10	11	12	13	14	**15**	**16**

Pin 15	+12V	Positive 12 Volts , power supply.
Pin 16	GND	Ground power supply.

Power supply :

Must be conformed to CEE/EEC EN60950 standard

12 Volts ± 5% (regulated) 0.5 Amp.

It could be coming from 12 Volts Wiegand power supply , conforms to the Security Industry Association's Wiegand standard March 1995.

Wiegand output wiring

1	**2**	**3**	**4**	**5**	6	7	8	9	10	11	12	13	14	15	16

Pin 1	TR- / D1	Out	Wiegand D1
Pin 2	TR+ / D0	Out	Wiegand D0
Pin 3	LED1	In	Wiegand LED1 (option)
Pin 4	LED2	In	Wiegand LED2 (option)
Pin 5	GND		Ground for Wiegand / RS485 / Dataclock

Electrical interface conforms to the Security Industry Association's Wiegand standard March 1995, and it is 5V TTL compatible.

Data Clock output wiring

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Pin 1	TR- / D1	Out	Clock
Pin 2	TR+ / D0	Out	Data
Pin 5	GND		Ground for Wiegand / RS485 / Dataclock

The electrical interface is 5V TTL compatible.

COM RS485 serial port

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Pin 1	TR- / D1	Out	RS485 TX/RX-
Pin 2	TR+ / D0	Out	RS485 TX/RX+
Pin 5	GND		Ground for Wiegand / RS485 / Dataclock

For a half-duplex RS485 connection, only Tx/Rx+ , Tx/Rx- and ground reference signals are necessary.

Depending on RS485 network , an impedance adaptation may be required.

A 120 Ohms resistor termination may be added to the terminal , by strapping pin 1 and pin 2 of the auxiliary connector.

1	2	3	4	5	6	7	8	9	10

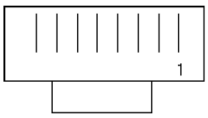
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Ethernet wiring

1	2	3	4	5	6	7	8	9	**10**	**11**	**12**	**13**	**14**	15	16

Pin 10	GND	Ground for Ethernet Interface (LAN 10/100 Mbps)
Pin 11	RX-	Receive negative Ethernet
Pin 12	RX+	Receive positive Ethernet
Pin 13	TX-	Transmit negative Ethernet
Pin 14	TX+	Transmit positive Ethernet

RJ 45 cabling recommendation :



RJ45 plug pinout is compliant with 10 base T , IEEE802.3 Specification.

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	Ground protection (option)	White Brown	White Brown	Purple
8	No connection	Brown	Brown	Brown

Output relay

1	2	3	4	5	**6**	**7**	8	9	10	11	12	13	14	15	16

Pin 6	Relay C0	Contact Relay 0
Pin 7	Relay C1	Contact Relay 1

Relay ratings

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

Tamper switch

1	2	3	4	5	6	7	**8**	**9**	10	11	12	13	14	15	16

Pin 8	TSW0	Tamper switch Contact 0
Pin 9	TSW1	Tamper switch Contact 1

Tamper-switch ratings

50 mA at 20 VDC max according to the safety extra low voltage.

USER INTERFACE

MorphoAccess™ terminal works upon three principles : Access control with identification, access control with authentication, and proxy mode.

These three principles consist in five functional modes :

- **Mode 0 :** Local identification (fingerprint capture) with a local base,
  MA100 default mode
- Mode 1 : Reserved
- Mode 2 : Proxy mode; Command sending to the MorphoAccess™
- **Mode 3 :** Authentication (contactless card reading minutiae) and fingerprint capture
  MA100 and MA120 default mode
- Mode 4 : Authentication (contactless card reading ID) and fingerprint capture with a local base
- Mode 5 : Modes 0 and 3, merged
- Mode 6: Reserved

The MorphoAccess™ 1xx series manage one base of 500 persons with 2 fingers, locally or remotely.

Recommendations

Areas containing combustibles

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

General precautions

- Do not attempt to repair your SAGEM 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 SAGEM MorphoAccess™ in damp areas (swimming pool...). Protect it from water and other liquids.
- Do not expose your SAGEM MorphoAccess™ to extreme temperatures.
- Use your SAGEM 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 SAGEM MorphoAccess™ has been installed.

Ethernet connection

It is recommended to use a category 5 shielding cable (120 OHM). It is also strongly recommended to insert a repeater unit every 90 m.

Extreme care must be taken while connecting Ethernet wire to the terminal block board since low quality connection may strongly impact Ethernet signal sensibility.

It is recommended to connect Rx+ and Rx- with the same twisted-pair wire (and to do the same with Tx+/Tx- and the other twisted-pair wire).

Date / Time synchronisation

If you except to use the MorphoAccessTM for application requiring high time precision we recommend to synchronize regularly your terminal time with an external clock.

The terminal clock has a 40 10^{-6} ppm time deviation.

Cleaning precautions

A dry cloth should be used.

Warning

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

Biometrics Terminals Hot-Line

To Access this service, please call us in order to get your login. Please send email rather call the hot-line.

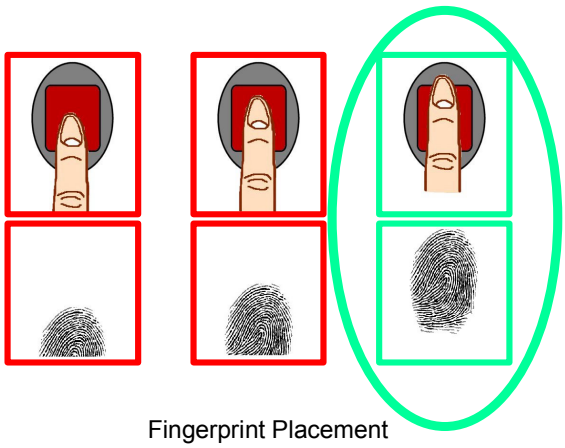
Email: hotline.biometrics@sagem.com

Tel : + 33 1 34 30 39 19 (Monday to Friday, 9H00am to 6H00pm)

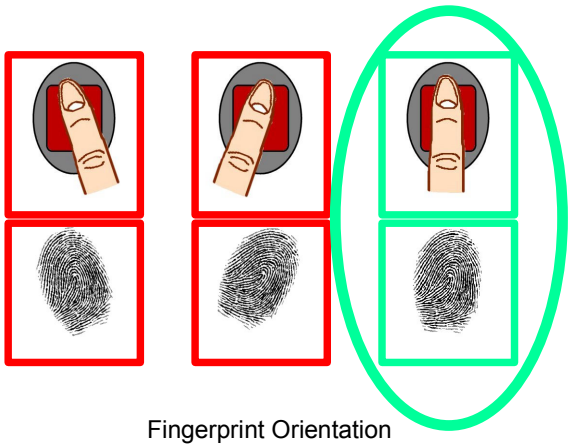
APPENDIX 1 - FINGERPRINT PLACEMENT RULES

To ensure a good quality contact of your finger on the terminal **you must leave your finger on the sensor until sensor light is turned** off.

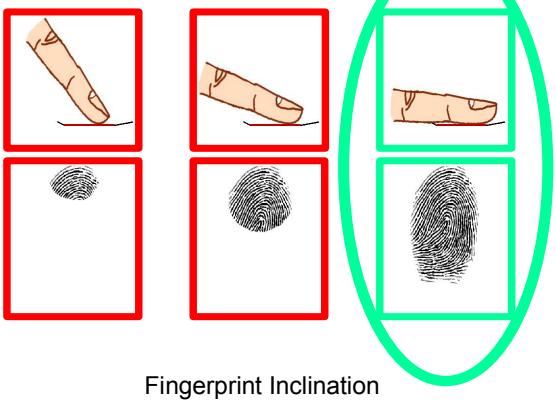
Area containing most of the information



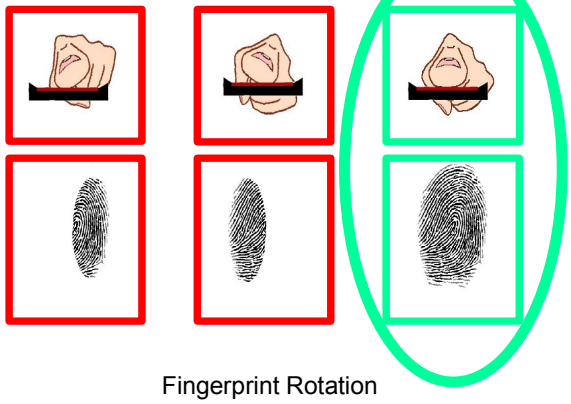
Fingerprint Placement



Fingerprint Orientation



Fingerprint Inclination



Fingerprint Rotation

APPENDIX 2 - BIBLIOGRAPHY

Configration Guide : MA1xx Series

This guide gives all informations about terminal parameters.

MorphoAccess Host System Interface Specifications

Describes MorphoAccess™ communication protocol (Serial and Ethernet).

MorphoAccess Remote Messages Specifications

Complete specifications describing remote messages send during control (Wiegand, Dataclock, Ethernet and Serial).

Finger Positioning

Highlight finger-positioning principles (See Appendix 1)

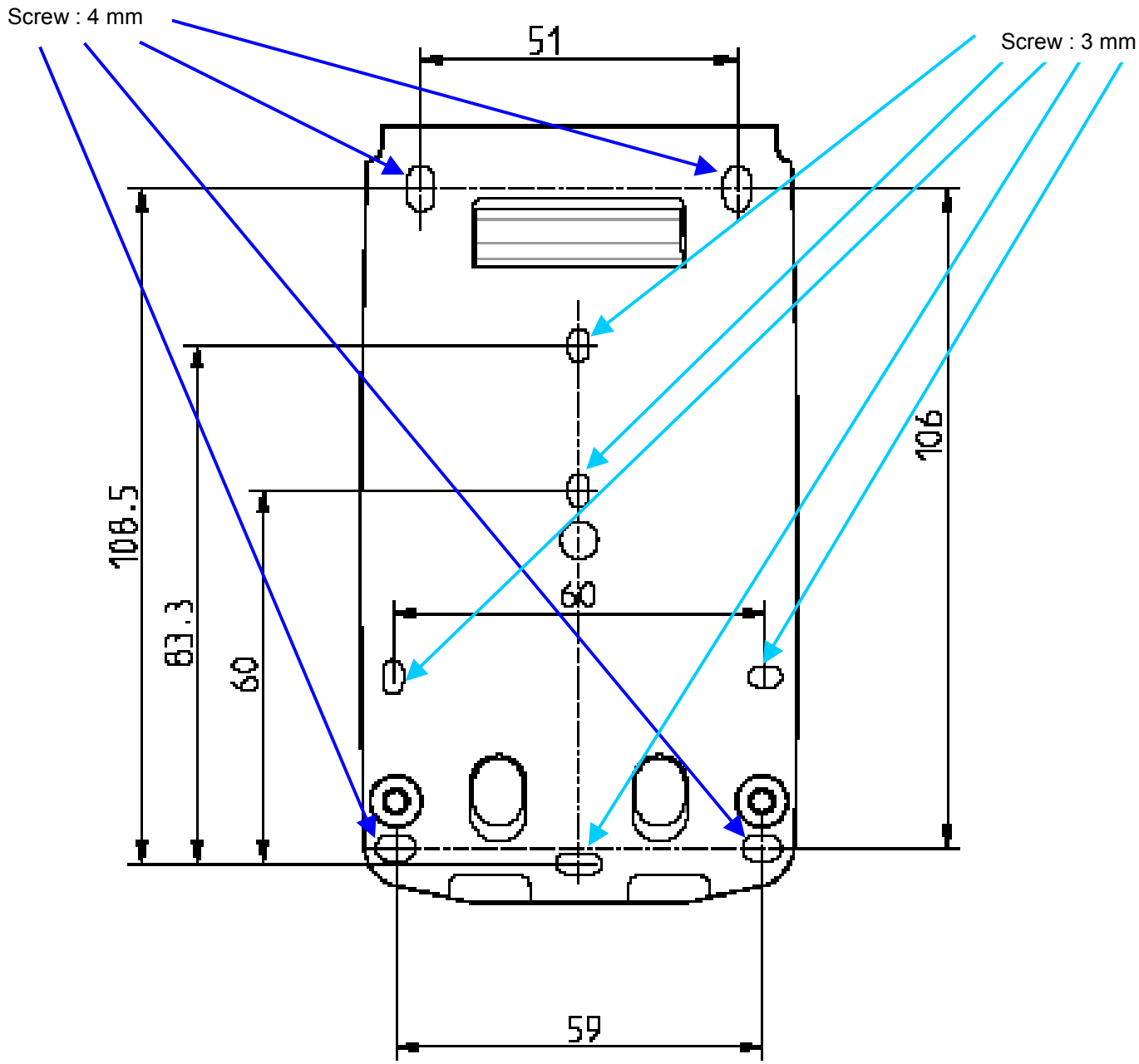
MA2G CFG Editor

This tool allows parameters configuration. Use Ethernet link.

MA2G Downloader

This software is designated to update MorphoAccessTM firmware.

APPENDIX 3 - DRILLING TEMPLATE



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