MorphoAccess® SIGMA Family
MorphoWave® Compact

Administration Guide

Osny, France

WARNING

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Revision History

The table below contains the history of changes made to the present document.

Version	Date	Description
01	April 2017	First version MorphoAccess® SIGMA Family Series Administration Guide Created from: 2014_0000002196_v11- MA SIGMA - Administration Guide 2015_2000010196_v8 - MorphoAccess® SIGMA Lite Series Administrator Guide
02	June 2017	OSDP support added Seos card support added Limited User Database added USB enable/disable feature added. Note about partionned usb key that should not be used Note about encoding card with only one finger that is not supported Note about encoded name and first name that are limited to 20 caracters Note about the behavior during second biometric attempt with MALite Note about transaction logs that should be erase Replace alphanumeric PIN by numeric PIN in webserver
03	July 2017	New administrator profile for SIGMA Series: Limited database admin (refer to ***Section 5 : MorphoAccess® Terminal Administration Menu***) Update first boot-up for MALITE terminal in LED – Buzzer Sequence chapter
04	October 2017	Update regarding L1 Legacy mode support added in MorphoAccess® SIGMA Extreme terminal Add ***Plugging a USB Wi-Fi™ or 3G adapter*** paragraph in ***Section 2***
05	October 2017	1. Added description for sending Extended Id to Control Panel through a custom Wiegand format. 2. Added description for Cyrillic keyboard support

		3. Added description for support of new font .
06	January 2018	Update company name (IDEMIA)
07	July 2018	Update *MorphoWave®* Compact
08	August 2018	1. Update figure: "Events Monitoring Configuration" with the new events list 2. Update chapter: "List of contactless cards validated" 3. Update chapter: "OSDP Protocol support" 4. Delete chapter: " Protocol configuration". The mode change is done via a firmware upgrade instead of a terminal protocol configuration. ⇨ Update chapter: " Terminal Firmware Upgrade " ⇨ Update chapter: "Information Menu" section "View Firmware Upgrade" 5. Upgrade chapter: "Access Schedule" 6. Upgrade chapter: "Access Request Result Log File" 7. Add "Job Code" Control
09	August 2018	Update Matching strategy products supported table for Morpho*Wave®* Compact
10	September 2018	Update Webserver capability of Morpho*Wave®* Compact
11	January 2019	1. Add "Touch Sound" configuration (section 5) 2. Update chapter : "Dynamic Message". This feature is available for « Access Granted » & « Access Denied » messages (section 5) 3. Add "Expiry date" configuration (Infinite or Limited duration) (sections 5 & 8) 4. Add "Card Data Encryption" configuration (sections 5 & 8) 5. Add a NOTE about the display duration of a "access control result" message (section 10) 6. Remove all NOTEs about the no support of Mifare Plus. 7. Remove all NOTEs about the unavailability of Access schedules features with 96 quarter hours and "Identified Mode" log format on MorphoWave® Compact terminals
12	April 2019	1. "Hardware Factory Reset" support added (Section 5) 2. "User Access Schedule" Support added (Section 18) 3. Configuration of retrofit port (Section 3) 4. Updated MMI Dynamic message modes (Section 5) 5. Configuration of different threshold values for authentication and identification (Section 5)
13	June 2019	Added QR code capability for *MorphoWave®* Compact Document OSDP unsecure commands supported in secure mode
14	September 2019	Added User Access Schedule details in Schedule Configuration Section.

		Update chapter: “Image Settings” for customize Access/Granted logo and customize animations for trigger events. Update “Scope of the document” by removing outdoor reference Update “Templates supported”, adding recommandation Update “Connection methods” with POE+ for MWC Update “Plugging a USB Wi-Fi™ or 3G adapter” removing installation section Update “MorphoAccess® Terminal License Management” removing internal licences Update “Encode Administrator card” remove limitation about iClass Update “Authentication process” update “List of contactless cards validated” Remove “Selection of user’s contactless card type (MIFARE® and/or DESFire®)” Update “Wiegand Parameters Settings”, remove reference to L& terminal and internal license Replace “Proxy Mode” by “Distant Commands Mode” Update “Sending Interfaces” add reference to “MA5G - Remote Message Specification”

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Section 1 :

Introduction

MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact Terminals

Congratulations for choosing a MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact Automatic Fingerprint Recognition Terminal.

MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact provide an innovative and effective solution for access control applications using Fingerprint identification.

Amongst a range of alternative biometric technologies, the use of finger imaging has significant advantages, i.e., each finger constitutes an unalterable physical signature, developed before birth and preserved until death. Unlike DNA, a finger image is unique for each individual; even identical twins.

The MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals integrate image processing and feature matching algorithms. This technology is based on lessons learned during 25 years of experience in the field of biometric identification and the creation of literally millions of individual fingerprint identification records.

Designed for physical access control applications, MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals feature a compact, attractive design, coupled with high reliability and security. These 5th generation terminals are both robust and easy to use for a variety of applications, including office, headquarters and administrative building security, as well as protection of external access points.

To ensure the most effective use of terminal, an administrator should read this User Guide thoroughly.

Scope of the document

This document is intended to guide administrators on 'How to setup and use' the MorphoAccess® SIGMA Family Series and the *MorphoWave®* Compact terminals. It also talks about capabilities, and the possible configurations that can be done along with detailed steps and snapshots. On top of this an administrator can learn about access control processes, compatibility with access control systems, Time & Attendance mode and how terminal is configurable through Webserver.

In order to setup and use the MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminal in the most efficient way, it is recommended for the Administrator to thoroughly read this guide.

Terminal Series	Terminal Name	Biometrics	Contactless smartcard reader		
			iCLASS® iCLASS® SE	MIFARE® DESFire® NFC®	Prox ®
MorphoAccess® SIGMA Series	MorphoAccess® SIGMA	✓			
	MorphoAccess® SIGMA iCLASS®	✓	✓		
	MorphoAccess® SIGMA Multi	✓		✓	
	MorphoAccess® SIGMA Prox	✓			✓
MorphoAccess® SIGMA Lite Series	MorphoAccess® SIGMA Lite MorphoAccess® SIGMA Lite+	✓			
	MorphoAccess® SIGMA Lite iCLASS® MorphoAccess® SIGMA Lite + iCLASS®	✓	✓		
	MorphoAccess® SIGMA Lite Multi MorphoAccess® SIGMA Lite + Multi	✓		✓	

Terminal Series	Terminal Name	Biometrics	Contactless smartcard reader		
			iCLASS® iCLASS® SE	MIFARE® DESFire® NFC®	Prox ®
	MorphoAccess® SIGMA Lite Prox MorphoAccess® SIGMA Lite + Prox	✓			✓
MorphoAccess® SIGMA Extreme Series	MorphoAccess® SIGMA Extreme iCLASS®	✓	✓		
	MorphoAccess® SIGMA Extreme Multi	✓		✓	
	MorphoAccess® SIGMA Extreme Prox	✓			✓
	MorphoAccess® SIGMA Extreme FFD iCLASS®	✓	✓		
	MorphoAccess® SIGMA Extreme FFD Multi	✓		✓	
	MorphoAccess® SIGMA Extreme FFD Prox	✓			✓
MorphoWave® Compact	*MorphoWave®* Compact MDPI	✓	✓	✓	✓
	MorphoWave® Compact MD	✓		✓	

About Biometrics

About fingerprint biometrics

Fingerprints are permanent and unique. They are formed before birth and last throughout one's life. Classification and systematic matching of fingerprints for different purposes have been in use since the late 19th century.

The skin on the underside of fingers is different from the skin on other areas of a human body. This skin has raised lines called; ‘ridges’.

These ridges do not run continuously from one side to the other, rather they may curve, end, or divide into two or more ridges (bifurcation and endings). Barring accidental or intentional mutilation, the ridge arrangement is permanent.

Fingerprints can be divided into three major ridge patterns such as Whorls, Loops and Arches. Unique characteristics known as Minutiae identify those points of a fingerprint wherein the ridges become either bifurcation or endings, as illustrated in Figure 1. These minutiae are the unique features, which form the basis of any system using fingerprint comparison techniques for identification and verification purposes.

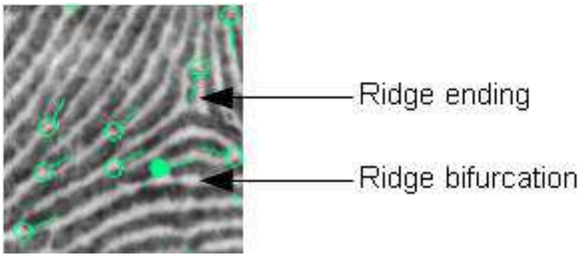


Figure 1: Minutiae are classified in two categories i.e. ridge ending and bifurcation

Fingerprint is a mature biometrics, in use for various applications based on individual’s authentication or identification, as it offers an excellent trade-off between criterias such as user acceptance, easiness of use, performance, stability, cost effectiveness and interoperability.

Since the early eighties, IDEMIA has carried an extensive research in the field of studying fingerprints and continually refined its expertise in the domain of fingerprint based recognition systems. It has lead the market in studied fingerprint characteristics and continually refined its expertise in fingerprint identification technology, developing first AFIS systems (Automated Fingerprint Identification Systems) and then applying its unique know-how and worldwide leading position to markets such as physical access control (premises), logical access control (computers and networks), secure payment transactions and OEM applications.

Templates supported

Morpho terminals are able to manage external templates. Following is the list of supported templates.

Template	Descritption	Use case	Sigma Sigma Lite/LiteS Sigma Extreme	MorphoWave Compact
pkcompv2	Morpho private fingerprint template	Template on card	Y	Y
pkmat	Morpho private fingerprint template	Legacy installations	Y	Y
ansi378_2004	Public fingerprint template Finger Minutiae Record	Legacy installations	Y	Y
iso19794_2_fmc_cs	Public fingerprint template Finger Minutiae Card Record Compact Size	Legacy installations	Y	Y
iso19794_2_fmc_ns	Public fingerprint template Finger Minutiae Card Record Compact Size	Legacy installations	Y	Y
iso19794_2_fmr	Public fingerprint template Finger Minutiae Record	Legacy installations	Y	Y
iso19794_2_fmc_cs_aa	Public fingerprint template Finger Minutiae Card Record Compact Size, minutiae ordered by Ascending Angle	Legacy installations	Y	N
minex_a	fingerprint template format	Legacy installations	Y	N
din_v66400_cs	Compact Size fingerprint template format (minutiae)	Legacy installations	Y	N
din_v66400_cs_aa	Compact Size fingerprint template format (minutiae ordered by Ascending Angle)	Legacy installations	Y	N
PK_PV multimodal (fingerprint part only)	Morpho private multimodal template	Legacy installations	Y	Y
pklite	Morpho private fingerprint template	Template on device	Y	Y
ansi378_2009	Public fingerprint template Finger Minutiae Record	Legacy installations	N	Y
iso19794_2_fmr_2011	Public fingerprint template Finger Minutiae Record	Legacy installations	N	Y
TEM from 4G	L-1 Bioscrypt private fingerprint template	Legacy installations	Y	N

	(pattern) (only used for 1/1 matching)			
VUR from 4G	L-1 Bioscrypt private fingerprint template (pattern) (only used for 1/1 matching)		Y	N
BUR from 4G	L-1 Bioscrypt private fingerprint template (pattern and minutiae) (used for 1/1 and 1/N matching)		Y	N

Notation

Product support notation:

In this document, the term "MorphoAccess® SIGMA Family Series" is considered either "MorphoAccess® SIGMA" or "MorphoAccess® SIGMA Lite" or "MorphoAccess® SIGMA Extreme" Series terminal, unless it is explicitly mentioned. The term "MorphoAccess® SIGMA Lite" is also considered "MorphoAccess® SIGMA Lite+" Series terminal, unless it is explicitly mentioned. The applicability of feature for SIGMA/SIGMA Extreme and SIGMA Lite product is described using following table format :

Feature/Function name	SIGMA Series SIGMA Extreme Series	SIGMA Lite Series
Feature 1	✓	✗
Feature 2	✓	✓

As MorphoAccess® SIGMA Series and MorphoAccess® SIGMA Extreme Series have almost the same functionalities, they are ususally in the same column except when it is necessary to detail.

MorphoAccess® SIGMA Series have a 5'' touchscreen color LCD in landscape mode.

MorphoAccess® SIGMA Extreme Series have a 5'' touchscreen color LCD in portrait mode.

For example, "**Terminal Administration Menu"** is available to SIGMA/SIGMA Extreme Series product and not available to SIGMA Lite Series product. "**Webserver Application"** is available to SIGMA and SIGMA Lite Series.

Feature	SIGMA Series	SIGMA Lite Series

	SIGMA Extreme Series	
Terminal Administration Menu	✓	✗
Webserver Application	✓	✓

Parameter description:

In this document a parameter is described using this format:

Parameter name	Value	Description
_	_	_

For example to allow additional attempt for biometric authentication:

Parameter name	Value	Description
auth_param.additional_bio_check_nb_attempt	1, 2 or 3	“1” to offer only one attempt to place finger “2” means that after a first incorrect identification or authentication a second chance is given to place finger on the biometric sensor. “3” to offer 3 attempts.

Section 2 :

Connecting the Terminal to a PC

General

Why would one connect the terminal to a PC?

The MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals are designed to be able to run in standalone mode, it means without any connection to a master system. But sometimes, a connection with a PC is useful to perform tasks like:

- Configuring the terminal.
- Maintaining terminal: firmware upgrade, add a license (to unlock an optional feature)
- Managing the database, i.e., adding or deleting or modifying the user data.
- Managing log files, i.e., get or delete the log files.
- Configuring the Wi-Fi™ connection.

Connection methods

The MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals can be connected to a PC by an Ethernet cable, either directly or through a LAN. The LAN can be reduced to only one Ethernet switch.

Once physically connected, the MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminal can be configured using an application such as **MorphoBioToolbox**.

A POE (Power over Ethernet) current injector is mandatory if the MorphoAccess® SIGMA Family Series terminal is not powered by the +12VDC/GND wires block.

A POE+ current injector is mandatory if the *MorphoWave®* Compact terminal is not powered by the +12VDC/GND wires block.

Network parameter initialization

The ‘default’ network parameters of the MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals are:

IP address Mode	Parameter	Factory value
Static	Terminal IP address	192.168.1.10
	Gateway IP address	192.168.1.254
	Sub network mask	255.255.254.0

	Host name	MAsigma/MAsigma-lite/MAsigma-lite-plus/MAextreme

If the terminal's default network parameter values cannot be used, it is recommended to refer to the "*Communication menu*" to change these values.

Point to Point Ethernet Connection

The MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals can be connected directly to a PC by an Ethernet cable.

The administrator needs to consider the points mentioned below prior to connecting the terminal directly to a PC via an Ethernet cable.

If the Ethernet port of the PC does not support the Auto-MDIX feature, then a crossover Ethernet cable is mandatory. If no crossover Ethernet cable is available, then a switch can be used (please refer to "*Connection through only one Ethernet switch*").

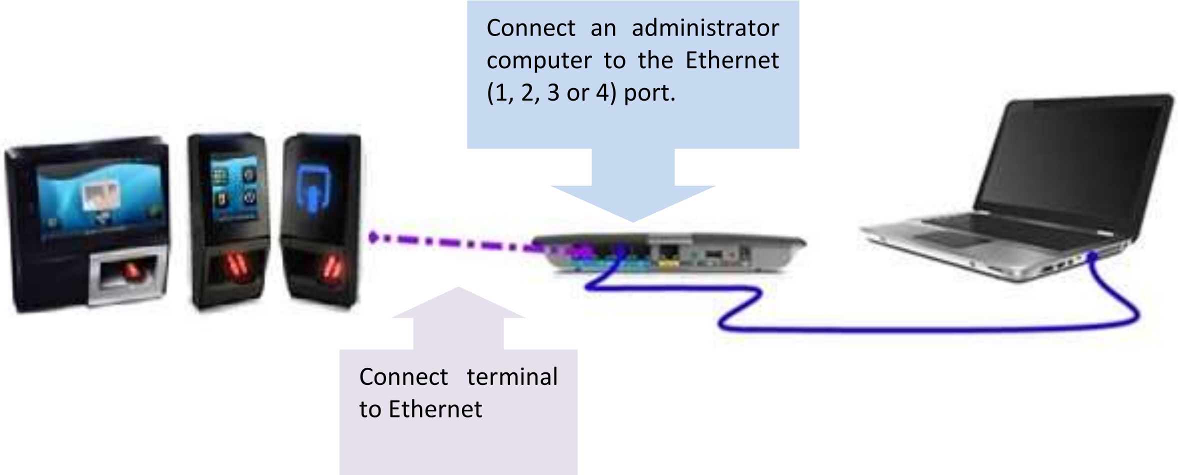
If the PC that the administrator uses is already connected to a LAN, then it must be either disconnected from the LAN, or equipped with a 2nd network interface board. This 2nd network board will be dedicated to the connection with the terminal. The administrator may need to modify the network parameters of the PC, in that case a Network or LAN administrator should be contacted for seeking the best solution.

Figure 2: Direct Point to Point Ethernet Connection

Connection through only one Ethernet switch

The MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals can be connected to a PC through an Ethernet switch. This is useful when no crossover cable is available, in that case the administrator can use one Ethernet switch and two Ethernet standard cables.

⚠**WARNING:** an Ethernet HUB doesn’t allow a connection between two of its ports. An Ethernet switch is really mandatory.



Connect an administrator computer to the Ethernet (1, 2, 3 or 4) port.

Connect terminal to Ethernet

Figure 3: Connection through an Ethernet switch

Connection through a LAN

Description

The administrator can also connect the MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals to a PC via Local Area Network (LAN) by specifying a unique IP address or host name.

The IP address could be static or dynamically assigned by the DHCP server in the network. If the administrator chooses to specify the host name of the terminal as its unique identifier, then in that case the 'terminal name' must be added to the DNS server database by the network administrator.

Figure 4: Connection through LAN

The administrator is recommended to connect MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals on a dedicated network in order to reduce possibilities of fraudulent access to the configuration of the terminal. It is advised to contact the network administrator for more information on LAN security strategies.

Before the administrator connects the MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals to a LAN, it is necessary to configure the LAN parameters into the terminal. The values of these parameters are to be provided and/or approved by the network administrator.

LAN with DNS Server

When a DNS server is available in the LAN, the PC can request the connection to the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal by using its host name instead of its IP address.

The network administrator must add the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal host name to the DNS server database, otherwise a TCP open session request using the terminal's hostname will fail.

It is useful to specify the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal by its host name, when the DHCP mode is enabled, as the IP address of the terminal can change after a power up.

LAN without DNS Server

This section helps the administrator in connecting the MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminal to a LAN that does not have a DNS server or when host name cannot be added to the DNS Server database.

The PC is not able to establish a connection with a terminal using its host name. An IP address of the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal is the only way to specify the terminal.

For standard use (excluding unscheduled maintenance operations), it is recommended that the administrator should not enable DHCP mode in this case. This is because in the DHCP mode the IP address for the terminal can change each time it is restarted.

Static IP address (DHCP disabled)

This is the easiest way for an administrator to connect a MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal to a LAN. In this case, the IP address of the terminal remains the same after each reboot and the Host System needs to know only this IP address in order to establish a connection with the terminal.

The IP address of the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal must be reserved in the router by the network administrator. The network administrator must also provide and/or approve the network parameter values for the terminal, i.e.:

- The MorphoAccess® SIGMA Family Series/*MorphoWave®* Compact terminal IP address,
- Gateway IP address,
- Local subnet masks value.

⚠**WARNING:** If the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal uses an IP address already assigned in the network, the connection to the terminal will be unstable.

Dynamic IP address (DHCP enabled)

When the administrator enables the DHCP mode in the terminal, the terminal IP address and other networking parameters are assigned automatically from the DHCP Server (network routers). This address could be different after each start-up as it depends on the DHCP strategy defined for the LAN.

Wi-Fi™ Network configuration

Requirements

Wi-Fi™ connection is available under the following mandatory conditions:

- The administrator must have plugged in a Wi-Fi™ USB adapter in the rear USB port of the terminal.
- Please refer to "*MorphoAccess® SIGMA Series terminal USB port with a Wi-Fi™ adapter*" for MorphoAccess® SIGMA Series and for MorphoAccess® SIGMA Lite terminal refer to **MorphoAccess® SIGMA Lite Series Quick User Guide**.
- The administrator must ensure that a Wi-Fi™ license (dedicated to this terminal) must be present in the terminal (as described in "*Communication licenses*"),

After the above operations ensure to reboot the terminal.

Configuration

The Wi-Fi™ network configuration is described in the section "*Wi-Fi™ Network Configuration*"

The Wi-Fi™ configuration parameters are described in the **MorphoAccess® 5G Series – Parameters Guide** document.

Troubleshooting

If the administrator has configured the terminal to use the Wi-Fi™ connection with the Wi-Fi™ USB adapter plugged in and if there is no WI-FI™ license present, the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal will emit a short-low tone.

To solve this issue, the administrator needs to unplug the Wi-Fi™ USB adapter and restart the terminal.

The Wi-Fi™ configuration parameters are described in the **MorphoAccess® 5G Series – Parameters Guide** document.

MorphoWave Compact - Installation guide.pdf

Plugging a USB Wi-Fi™ or 3G adapter

The rear USB port of the MorphoAccess® SIGMA Series terminal is dedicated to the connection of a Wi-Fi™ or 3G USB adapter.

This mini USB port is located at the back panel of the terminal.

The Wi-Fi™ adapter accessory can be ordered under reference number "MA WI-FI™ PACK" at the same time as the license that unlocks the Wi-Fi™ feature on the terminal.

Their installation are described in the:

- MA SIGMA - Installation Guide.pdf
- MA SIGMA Lite - Installation Guide.pdf
- MA SIGMA Extreme - Installation Guide.pdf
- MorphoWave Compact - Installation guide.pdf

Section 3 : **Terminal Configuration and Administration**

Understanding MorphoAccess® Configuration

Presentation

MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals have factory default settings or reset values for all the supported functionalities. The administrator can configure the terminal depending on the desired level of security using these methods:

Feature	SIGMA Series SIGMA Extreme Series	SIGMA Lite Series	MorphoWave ® Compact
Terminal Administration Menu	✓	✗	✓
Webserver Application	✓	✓	✓
Distant system Application	✓	✓	✓
USB Scripts	✓	✓	✓
Morpho Bio Toolbox	✓	✓	✓

- **Terminal Administration Menu:** The administrator can login to terminal and access several functionalities under administration menu. This allows administrator to perform configuration, add users, upload multimedia, download logs, etc. The complete menus are covered in the subsequent sections of this document;

- **Webserver Application:** Webserver can be termed as a remote configuration panel of MorphoAccess® SIGMA Family Series terminal. Using Webserver, the administrator can configure any parameter of the terminal while connected remotely. Webserver is connected to the terminal through Ethernet or Wi-Fi™ network. Only an administrator with full administrative rights can login to Webserver. Webserver also has a 'Complete Configuration' tab from which the administrator can configure all possible parameters.For detailed description of all the parameters, please refer to **MorphoAccess® 5G Series – Parameters Guide** document.

Modifying the value of a parameter

There are two ways an administrator can modify the value of a terminal parameter:

- Remotely through Ethernet or Wi-Fi™, with a client application/interface running on the Host System (such as **MorphoBioToolbox** or a web browser connected to the embedded Webserver),

- With a USB mass storage key, which contains a script prepared on a PC using MorphoBioToolBox.

Configuring a Networked MorphoAccess®

Introduction

The administrator can manage a MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal by a PC connected to the terminal, by using an application such as a web browser connected to the embedded Webserver (in MA5G mode) or **MorphoBioToolbox**.

The remote operations available are mainly:

- Time and Attendance configuration
- Read and Modify parameter values
- Manage access schedules
- Manage network configuration
- User Management
- Log Management
- Tamper settings, etc.

The terminal works as a TCP/IP server, which waits for a request from the Host System application that acts as a TCP/IP client.

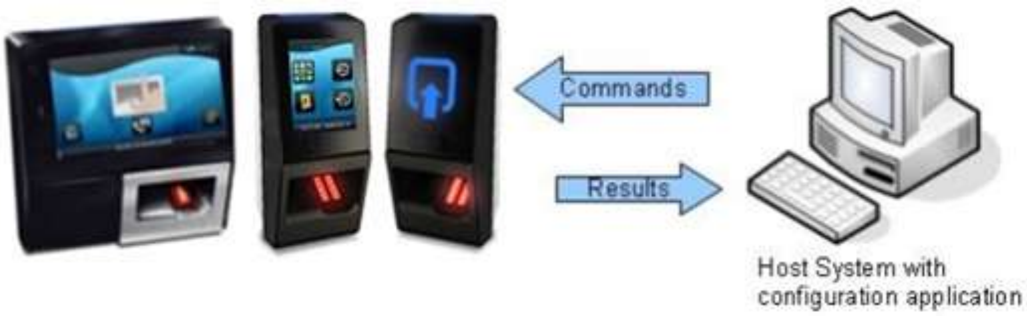


Figure 5: Configuration of a MorphoAccess® SIGMA Family terminal by a Host System

To know more on the commands supported by the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal, the administrator needs to refer to **MorphoAccess® 5G Series – Host System Interface Specifications** document.

Network factory settings

By default the IP address of the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal is 192.168.1.10. The administrator can change IP address either by the local Administrator Menu or a distant system connected though an IP link or with a USB flash drive (USB Scripts).

The default server port is 11010.

Date/Time settings

The administrator can update the date/time of the terminal by a distant system, by the local Administrator Menu or Webserver.

SSL Securing

Secure Sockets Layer (SSL) and its successor Transport Layer Security (TLS) are cryptographic protocols designed to provide communication security over Ethernet or Wi-Fi™ channels.

These protocols are used to protect the communication between the MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal and a distant system, such as a central access controller or a terminal configuration station.

References

- Refer to "*SSL Configuration*" under Security Menu section in this guide, to enable and configure SSL communication port

Network Wi-Fi™ configuration

Administrator can configure Wi-Fi™ parameters, Wi-Fi™ connection is available under the following conditions:

- The administrator has plugged in a Wi-Fi™ USB adapter. Details of the Installation procedure are described in the **MorphoAccess® SIGMA Series Installation Guide or** in the **MorphoAccess® SIGMA Lite Series Installation Guide**

- The administrator had loaded MorphoAccess® WI-FI™ License in the terminal.

NOTE 1: A DHCP server and a DNS server are mandatory when the Wi-Fi™ interface is configured in DHCP mode.

- The DHCP server automatically attributes an IP address to the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal

- The DNS server links the terminal hostname to its real IP address

- It is also important that the DNS server is updated each time the DHCP server attributes another IP address to a terminal.

NOTE 2: A MorphoAccess® Wi-Fi™ License is mandatory.

- If Wi-Fi™ USB adapter is plugged in and if there is no license present; then on configuring WLAN, the terminal will display an error message: “license not present”.

See Wi-Fi™ parameters description in “*Wi-Fi™ Network Configuration*” section.

MorphoAccess® Terminal Database Management

Database Management	SIGMA Series SIGMA Extreme Series	SIGMA Lite Series	MorphoWave® Compact
From administration menu of the terminal	✓	✗	✓
From Webserver Application	✓	✓	✓

General

The administrator can manage the database of the MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal by using administration menu of the terminal or through Webserver application connected to terminal.

Adding a user to the database

Adding a user means to create a record of the biometric data of two fingers of the user and a unique identifier. Users stored in the database are of following types:

- **Normal Users** are the ones to whom access is granted or rejected based on access rights check
- **Authorized Users** are the ones which are checked by the centralized access controller, before granting access
- **VIP Users** are allowed access without performing biometric/PIN check by the terminal. Read more about VIP users under "*Access Control Process for VIP Users*"
- **Administrators** are stored also in the user database. Administrators are allowed access to the management menu of the terminal and perform configurations.

The user's enrolment is directly done on the MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal without managing a database on the PC.

Removing a user from the database

Removing a user means deleting the user's record from the database of the MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal.

The user can be removed directly from the MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal without managing a database on the PC.

Database Size

The MorphoAccess® SIGMA Family Series / *MorphoWave®* Compact terminal database storage is as follows:

Database Limits	SIGMA Series SIGMA Extreme Series	SIGMA Lite Series	MorphoWave® Compact
Maximum User (Including Administrator)	5,000	500	5,000
Maximum Authorized User	250,000	250,000	250,000
Maximum VIP User	100	100	100
Transaction Log	100,000	100,000	100,000

- **Maximum User** indicates the basic capacity of terminal users' database including administrators.
- **Maximum Authorized User** List Capacity indicates the maximum number of users which can be added to authorize user list. The default capacity is 250,000 users. Or 40,000 users for the *MorphoWave®* Compact
- **Maximum VIP User** capacity, indicates the maximum capacity of the users which can be enrolled as VIP users. The default capacity is 100 users.
- **Transaction Log** capacity, indicates the maximum capacity of terminal to store transaction logs. The default capacity is 100,000 users.

The administrator can increase database size by installing licenses. E.g. the user record storage size can be increased up to 10,000 user records with a MA_10K_USERS license. For more details on license management please refer to "*MorphoAccess® Terminal License Management*".

MorphoAccess® Terminal License Management

The administrator can install one or more licenses in the terminal in order to unlock one or several optional features of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal. The MorphoAccess® SIGMA Family Series and *MorphoWave®* Compact terminals support the following license types:

License type	SIGMA Series	SIGMA Extreme Series	SIGMA Lite Series	MorphoWave® Compact
MA_3K_USERS	✗	✗	✓	✗
MA_10K_USERS	✓	✓	✓	✗
MA_20K_USERS	✗	✗	✗	✓
MA_40K_USERS	✗	✗	✗	✓
MA_50K_USERS	✓	✓	✗	✗
MA_100K_USERS (extends the maximum size of the database)	✓	✓	✗	✗
MA_250K_LOGS	✓	✓	✗	✓
MA_500K_LOGS	✓	✓	✗	✓
MA_1M_LOGS (extends the maximum size of the database)	✓	✓	✓	✓
MA_WI-FI™ (allows Wi-Fi™ connection)	✓	✓	✓	✓
MA_3G	✓	✗	✗	✗

The function of each license is described in detail in the following sections.

User licenses

Administrator can install user licenses for extending this maximum database limit. User data are stored with two fingers per user record. In case of duress finger is enabled, it can have three fingers per user record. These are the license categories to choose from:

- The **MA_3K_USERS** license extends the maximum size of the database to 3,000 user records. This license is applicable for MorphoAccess® SIGMA Lite Series terminal.
- The **MA_10K_USERS, MA_50K_USERS** and **MA_100K_USERS** licenses extend the maximum size of the database to respectively 10,000 user records, 50,000 user records and 100,000 user records. These licenses are applicable for MorphoAccess SIGMA Family Series only.
- The **MA_20K_USERS** and **MA_40K_USERS** licenses extend the maximum size of the database to respectively 20,000 user records and 40,000 user records. These licenses are applicable for the *MorphoWave®* Compact only.

⚠**WARNING:** It is a pre-requisite that the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal should have SD card plugged in it, prior to a license upgrade.

Log licenses

By default, MorphoAccess® SIGMA Family and *MorphoWave®* Compact Terminals can store up to 100,000 logs. The administrator can upgrade the storage capacity of the logs by installing Log licenses. Following are the types of Log Licenses:

- The **MA_250K_LOGS** license extends the maximum size of the database to store 250,000 logs
- The **MA_500K_LOGS** license extends the maximum size of the database to store 500,000 logs
- The **MA_1M_LOGS** license extends the maximum size of the database to store 1,000,000 (1 million) logs

Communication licenses

MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminals support communication to distant system through Ethernet Connection. There are other networks such as Wi-Fi™ and 3G which can be used for connecting terminal with distant systems. The administrator needs to install license(s) in order to enable the communication between the terminal and the distant system. Following is an overview of the types of licenses available.

Following types of communication licenses are available:

- MA_WI-FI

  The MA_WI-FI license enables the Wi-Fi™ network (WLAN) which replaces the standard Ethernet connection. The terminal can communicate with distant systems through WLAN.

  NOTE: The license alone is not enough, a USB Wi-Fi™ adapter compatible with MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminals is mandatory. The adaptor and license can both be ordered under reference "MA WI-FI PACK".

- MA_3G

  The administrator needs to install the MA_3G license in order to enable the 3G network (GPRS/GSM/3G) which replaces the standard Ethernet connection. The terminal can communicate with distant systems through 3G/GPRS/GSM network. This license is applicable to MorphoAccess® SIGMA Series terminal only.

Getting a license for a MorphoAccess® SIGMA Family Series or *MorphoWave®* Compact terminal

Morpho Online License Generator allows ordering any type of license for any kind of Morpho biometric product. The file containing the license is automatically sent by email.

To access the Online License Generator, the administrator requires an account in the biometric terminals support website. Administrator also needs to create an account in the License Generator sub website.

www.biometric-terminals.com (see “License Generator" section)

If the administrator does not have an account, the customer support service must be contacted:

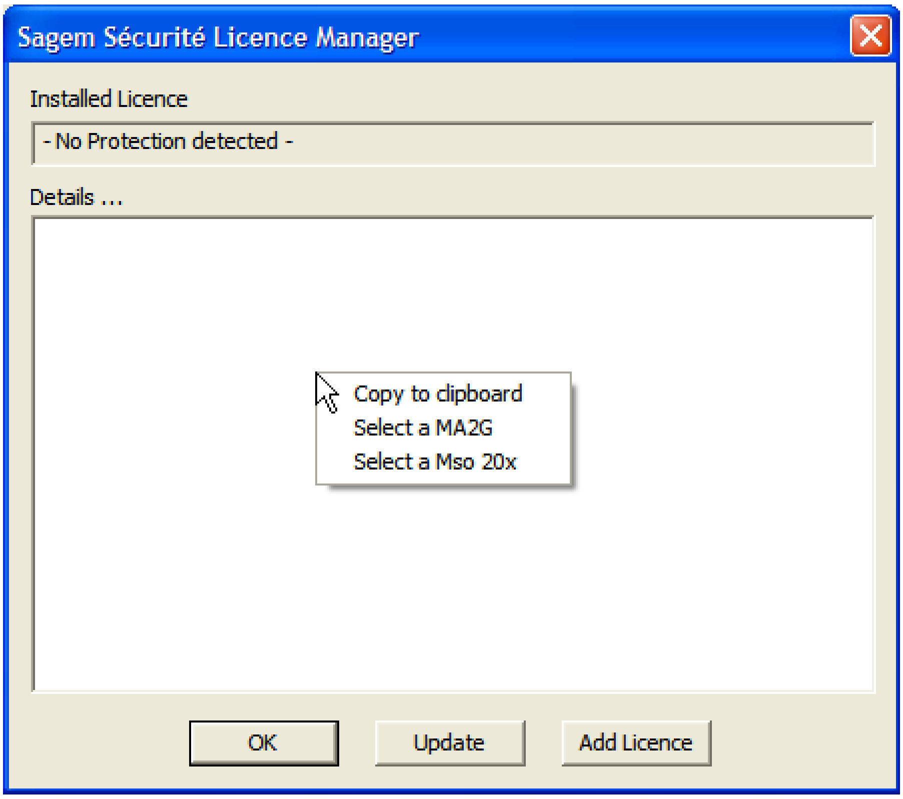
support.bioterminals@idemia.com

The license is delivered in a file dedicated to only one terminal. Each license file is generated for a unique serial number, and this is checked by the license installation tool, when the license is added to the terminal. The file must not be modified.

Checking licenses installed in the terminal with license manager application

The Terminal Info page of the Webserver on MorphoAccess® SIGMA Lite or Information Menu of the terminal (on MorphoAccess® SIGMA, SIGMA Extreme and SIGMA Lite+ and *MorphoWave®* Compact) allows to check the installed licenses: please refer to **Information Menu > Device section**. If the administrator wants to view the installed licenses or add licenses from a PC, an Ethernet or Wi-Fi™ connection and License Manager Application are needed. The application can be downloaded from our biometric terminals website (www.biometric-terminals.com).

Screens & Steps



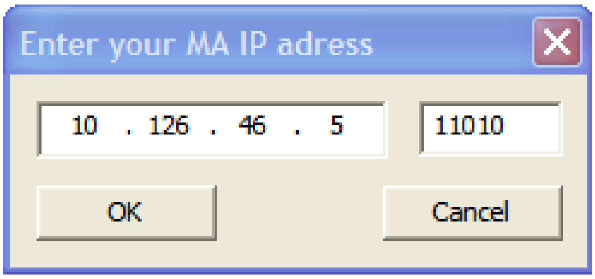
Sagem Sécurité Licence Manager

Installed Licence

- No Protection detected -

Figure 6: License Manager, adding a MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal

1. Launch the License Manager application, right click in the main window and select the “Select a MA2G” operation.



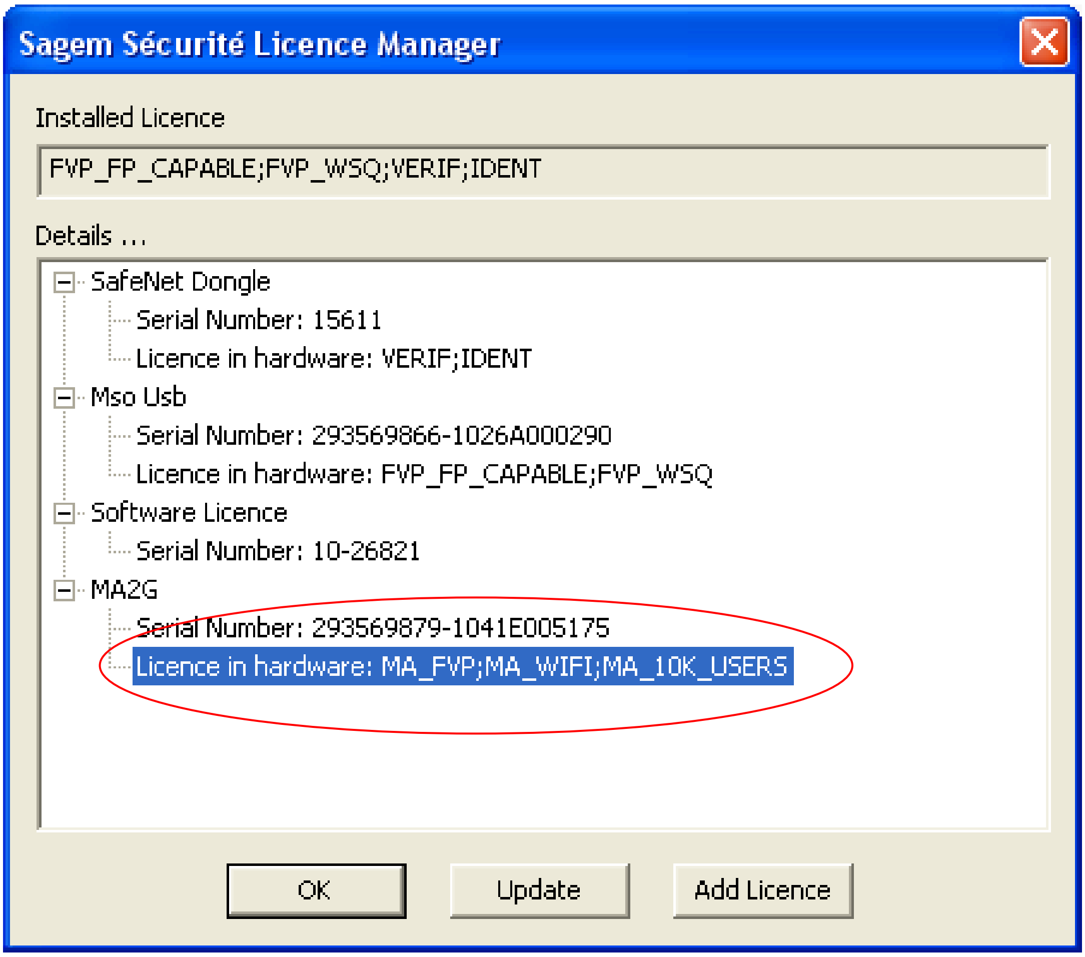
Enter your MA IP adress

10 . 126 . 46 . 5

11010

Figure 7: License Manager, enter the IP address

2. Enter the IP address of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal in the window that opens.



Sagem Sécurité Licence Manager

Installed Licence

FVP_FP_CAPABLE;FVP_WSQ;VERIF;IDENT

Details ...

- SafeNet Dongle
  - Serial Number: 15611
  - Licence in hardware: VERIF;IDENT
- Mso Usb
  - Serial Number: 293569866-1026A000290
  - Licence in hardware: FVP_FP_CAPABLE;FVP_WSQ
- Software Licence
  - Serial Number: 10-26821
- MA2G
  - Serial Number: 293569879-1041E005175
  - Licence in hardware: MA_FVP;MA_WIFI;MA_10K_USERS

Figure 8: Licenses installed in a MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal

3. Refer to the screenshot above, the licenses on the MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal are listed in the “license in hardware" line in the main window.

For further information concerning the license management tool (License Manager PC tool), please see the document **MorphoAccess® SIGMA, SIGMA Extreme and SIGMA Lite Series License Management**.

Installing a new license

To install a new license, the administrator must follow the steps mentioned below:

- Copy the received license file (.lic extension) on the PC
- Launch the "License Manager" application then add the MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal IP address as specified in the previous section.
- Click “Add license”, then “Browse…” to select the license file (.LIC).
- A specific window will open to indicate whether or not the license has been loaded successfully.
- The main window will then indicate the presence of the new license.

The terminal must be restarted to activate the different functions unlocked by the new license.

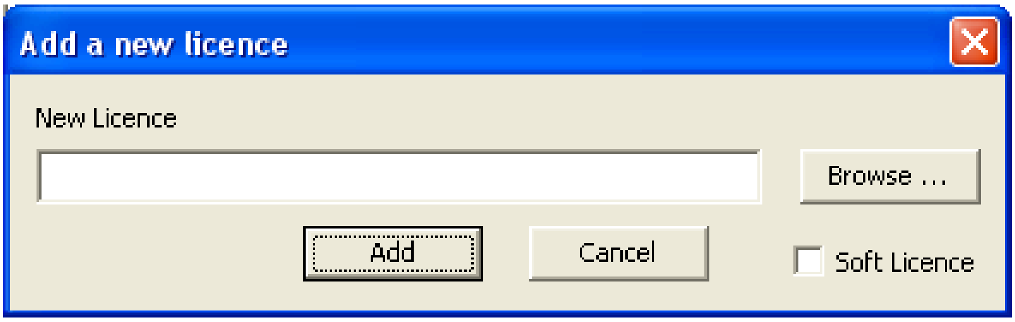


Figure 9: Adding a license in a MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact terminal

For further information on how to use the license management tool (License Manager PC tool), the administrator needs to refer **MorphoAccess® SIGMA, SIGMA Extreme and SIGMA Lite Series License Management** document.

Terminal Firmware Upgrade

How to get latest version of firmware

The administrator can obtain the latest version of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact firmware on a CD/ROM package from the customer service, or download it from IDEMIA Website dedicated to biometric terminals:

http://www.biometric-terminals.com/

The administrator needs to have a login name and a password in order to access the protected location which contains the firmware. If the administrator does not have the login information, please ask for it to our customer service using the mailing address below:

support.bioterminals@idemia.com

How to Open/Close the Retrofit port

Retrofit port or Firmware upgrade port can be set to open or close through a configuration key "comm_channels_state.upgrade_firmware". By default the value of this configuration is "1" which implies the port is open. To close the retrofit port, set the value of this key as "0".

How to upgrade the firmware

The administrator can upgrade the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal firmware. This can be done from PC through an IP link, i.e., Ethernet or Wi-Fi™.

The easiest way to update the firmware is to use **MorphoBioToolBox** software application.

Note: The administrator must not switch the terminal off during a firmware upgrade. The administrator also needs to ensure that the power supply of the terminal is stable before commencing a firmware upgrade. Otherwise instability can occurs.

Also ensure that the retrofit port is open before starting the firmware upgrade. To check if the retrofit is open or not, check the value of configuration key "*comm_channels_state.upgrade_firmware*" which should be set to 1 (default value). If the value is set to 0 then the retrofit port is closed and the firmware upgrade process could not be started.

Firmware upgrade using a USB Mass Storage Key

The administrator can update the firmware using a USB mass storage key.

This operation is possible by using USB Scripts created from **MorphoBioToolBox** software application.

Firmware upgrade tool for expert users

Upgrade Tool

A software application called RetrofitTool is available for expert users. This tool allows the administrators to upgrade the firmware of a specified MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, directly. This tool has no graphic interface. The firmware can be upgraded via the command line interface.

Syntax of the command-line

[-h] [-v] -f *path_to_file* -e *IP_address* [-t *timeout*] [-p *port_number*]

Options	Description
-h	Displays the help menu.
-v	Verbose mode. This is optional.
-f path	Path to the binary file used for upgrade. This is mandatory.
-e IP_address	IP address of the terminal to upgrade. This is mandatory.
-t timeout	Timeout of the connection (in ms). This parameter is optional. Its default and minimal value is 10s.
-p port_number	TCP port number to be used to connect the terminal. This is an optional parameter. Its default value is 11010.

Samples

The following command upgrades firmware of terminal at IP address 192.168.1.2 using file new_firmware.bin

```
-f new_firmware.bin -e 192.168.1.2
```

Upgrades firmware of terminal at IP address 192.168.1.2 using file new_firmware.bin, with a 15 seconds timeout

```
-f new_firmware.bin -e 192.168.1.2 -t 15000
```

Upgrades firmware of terminal at IP address 192.168.1.2 using file new_firmware.bin using verbose mode

```
-v -f new_firmware.bin -e 192.168.1.2.
```

Note: If the Ethernet connection is broken during the firmware upgrade process, user can re-plugin the Ethernet cable and relaunch RetrofitTool with the same command line. The firmware upgrade is restarted from beginning and executes all commands including proper restarting of the terminal.

MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact Modes

MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact native mode

MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminals are by default delivered in the native mode. The native mode is designed by MA5G which means MorphoAccess® 5th generation. This mode supports a lot of new features and for certain terminals a remote management application called Webserver.

MorphoAccess® 500 or J Series legacy mode

The MorphoAccess® SIGMA Family terminal can be operated in MA500 mode (also referred as Legacy Morpho). For that, the administrator shall download a dedicated firmware : firmware name with the following extension “MA2G “.

In this case, the terminal will support configurations and operations of MA500 terminals. It can authenticate users enrolled in the MA500 terminals, using biometric check as well as contactless card. New users can also be enrolled in MA500 mode.

Note : The *MorphoWave®* Compact does not emulate the legacy terminals.

L-1 Bioscrypt 4G Series legacy mode

MorphoAccess® SIGMA Family terminal can be operated in Bioscrypt 4G mode (also referred as Legacy L1). For that, the administrator shall download a dedicated firmware : firmware name with the following extension “BS“.

In this case, the terminal will support limited operations and configurations done via the SecureAdmin application. The terminal in L1 mode is able to authenticate the users enrolled on 4G terminals and contactless cards. However **user enrolment** in legacy L1 mode on MorphoAccess® SIGMA Family terminal is possible only when the SecureAdmin station is equipped with a MorphoSmart™ MSO biometric sensor.

For details about these limitations, refer to **MorphoAccess® 5G Series – Morpho L-1 Bioscrypt Legacy Mode Limitations** document**.**

Note : The *MorphoWave®* Compact does not emulate the Bioscrypt terminals.

Access Path to read the mode applied by the terminal

Access point	Access Path	SIGMA Series SIGMA Extreme Series	SIGMA Lite Series

		Morpho*Wave*® Compact	
Terminal Menu	Information Menu > Terminal > Firmware Version	✓	✗

NOTE: When terminal switches from MA5G to any of the legacy modes via a firmware upgrade, the entire configuration and database is erased except communication links and the language settings.

Section 4 : **Terminal First Boot Assistant**

Assistant Initialization

First Boot Assistant (FBA) is launched as soon as the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is started for the first time. All the basic configurations can be done by following the simple and easy to follow menu on the FBA screen. FBA can also set to launch on terminal reboot.

The administrator needs to follow the access path mentioned below in order to access First Boot Assistant from the Management menu.

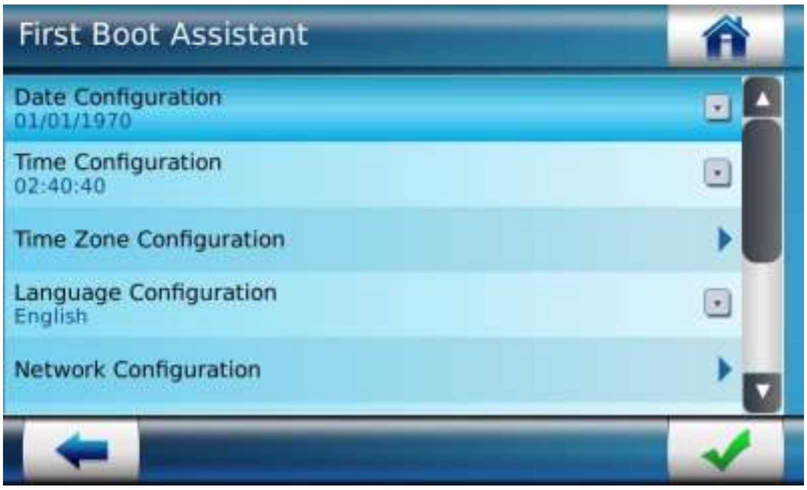
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant	✓	✗

Pre-requisites

- The administrator needs to verify that the battery is plugged in the terminal beforehand. Battery backup is necessary for preventing data loss in the event of a power cut or a power loss.
- The administrator also needs to ensure that if the terminal is not powered for a very long time, it will be necessary to change the battery

Screens & Steps


First Boot Assistant

Date Configuration
01/01/1970

Time Configuration
02:40:40

Time Zone Configuration

Language Configuration
English

Network Configuration

Figure 10: First Boot Assistant Screen displayed on Installation

1. By default the First Boot Assistant screen will open when the terminal is powered up for the first time. The administrator can also access FBA settings by following the access path mentioned above.
2. The administrator can configure the basic parameters via the First Boot Assistant Screen. For more details, please refer to the sections below:

Date & Time Configuration

The administrator must configure the current date, time and time zone in the terminal, on the first boot or a reboot of the terminal.

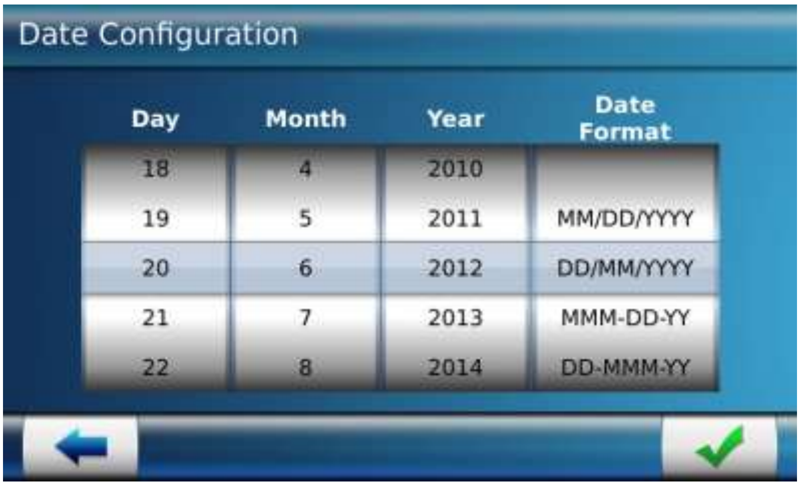
NOTE: The time stored in the product is not lost if power supply is removed for up to 48 hours.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant ***OR*** System Menu > Terminal Settings > Date and Time Settings	✓	✗

Screens & Steps

1. Select **Date Configuration**



Date Configuration

Day	Month	Year	Date Format
18	4	2010	
19	5	2011	MM/DD/YYYY
20	6	2012	DD/MM/YYYY
21	7	2013	MMM-DD-YY
22	8	2014	DD-MMM-YY

Figure 11: Configuring Current Date

2. Scroll up or down to select current **Day**, **Month**, and **Year**
3. Select **Date Format** in which, the date should be displayed. The available formats are:
   a. MM/DD/YYYY

   b. DD/MM/YYYY

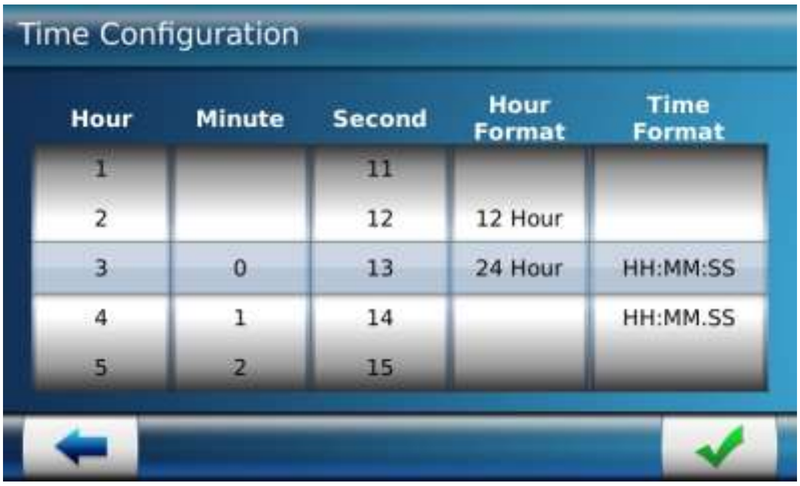
   c. MMM-DD-YY

   d. DD-MMM-YY

   e. YYYY/MM/DD (this format is not available, if terminal is set in L1 mode)

4. Click on the Check button "✓" to save the setting

5. Select **Time Configuration**



Time Configuration

Hour	Minute	Second	Hour Format	Time Format
1		11		
2		12	12 Hour	
3	0	13	24 Hour	HH:MM:SS
4	1	14		HH:MM.SS
5	2	15		

Figure 12: Configuring Current Time

6. Scroll up or down to select current **Hour**, **Minute**, and **Second**

7. Set **Hour Format** as analogue i.e. '12 Hour' or digital i.e. '24 hour'

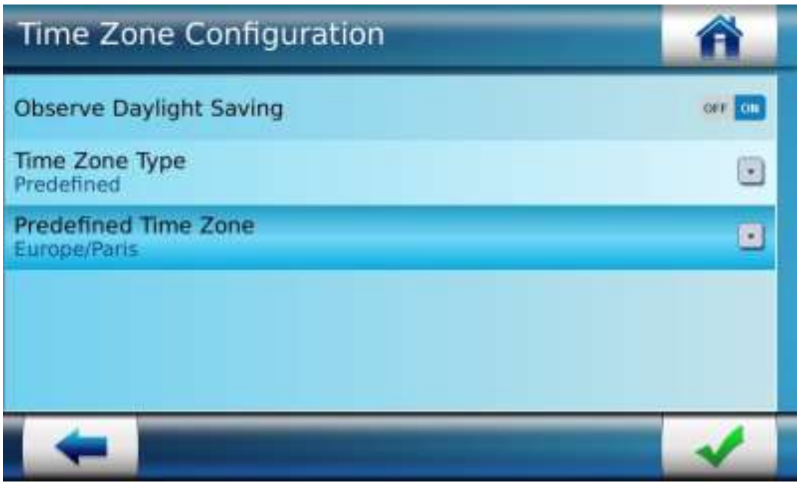
8. Set **Time Format** in the selection area which is used to select display format. The available formats are

   a. HH:MM:SS

   b. HH:MM.SS

9. Use Check button "✓" to save the setting

10. Select **Time Zone Configuration**



Time Zone Configuration

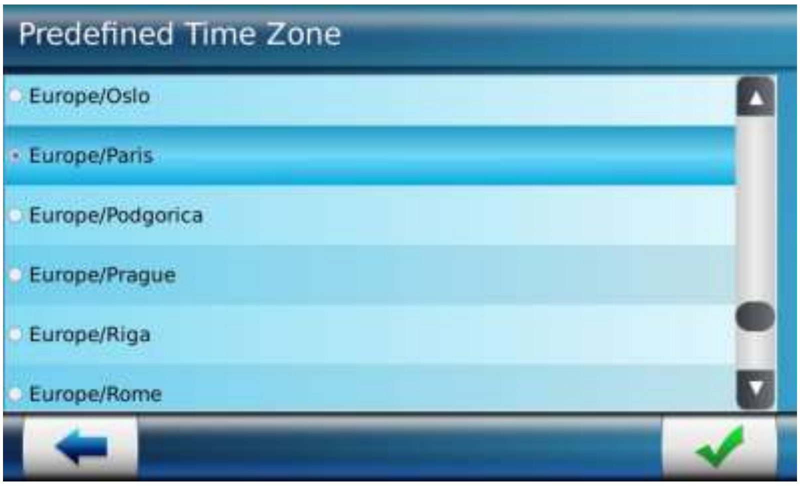
Observe Daylight Saving OFF ON

Time Zone Type
Predefined

Predefined Time Zone
Europe/Paris

Figure 13: Configuring Time Zone

11. Select **Observe Daylight Saving** as ‘On’, in case the administrator needs to auto-schedule the time during the daylight saving months. By doing this, the terminal’s time is automatically set to an hour later than the actual time while in the daylight saving time frame. For example, if the current time is 10 am then in the day light saving period, the time is automatically set to 11 am.
12. Select **Time Zone Type** as ‘Predefined’ or ‘Custom’. If the administrator selects Predefined, the list of Predefined time zones of the entire world will be displayed to choose from. The administrator must specify a customized time zone when ‘Custom’ has been selected.
13. Administrator must click on the Check button “✓” to save the setting
14. Based on the **Time Zone Type**, Time Zone selection parameters are displayed next

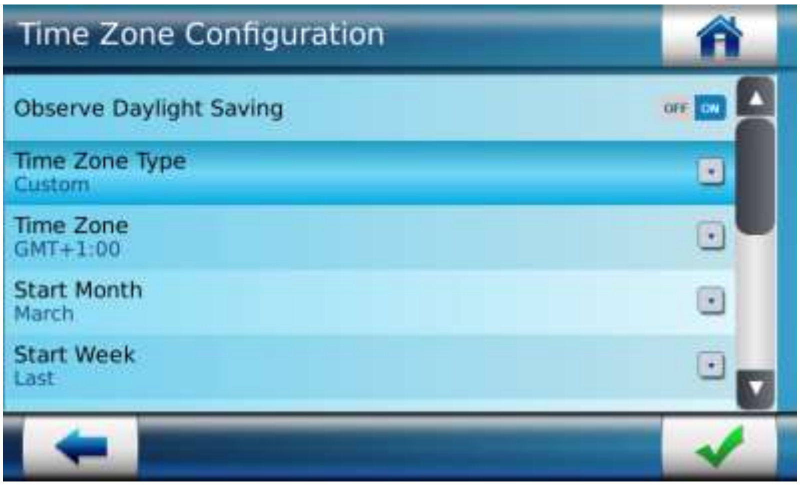


Predefined Time Zone

○ Europe/Oslo
● Europe/Paris
○ Europe/Podgorica
○ Europe/Prague
○ Europe/Riga
○ Europe/Rome

Figure 14: List of Predefined Time Zones of World

15. The list of Predefined Time Zones of the entire world is displayed
16. Scroll up or down to select required **Time Zone** from the list
17. Click on the Check button "✓" to save the setting



Time Zone Configuration

Observe Daylight Saving OFF ON

Time Zone Type
Custom

Time Zone
GMT+1:00

Start Month
March

Start Week
Last

Figure 15: Custom Time Zone Setting

18. If the administrator selects the **Time Zone Type** as 'Custom', then an administrator need to define the below mentioned time zone parameters:
19. Select **Time Zone**

NOTE: While setting a customized time zone, the administrator needs to ensure that the GMT offset that is set is the 'Standard GMT Offset' of the region.

20. **Start Month**, **Start Week**, **Start Day**, **Start Hour of Day**, **End Month**, **End Week**, **End Day** and **End Hour of the Day**
21. Click on the Check button "✓" to save the setting

Trigger Event

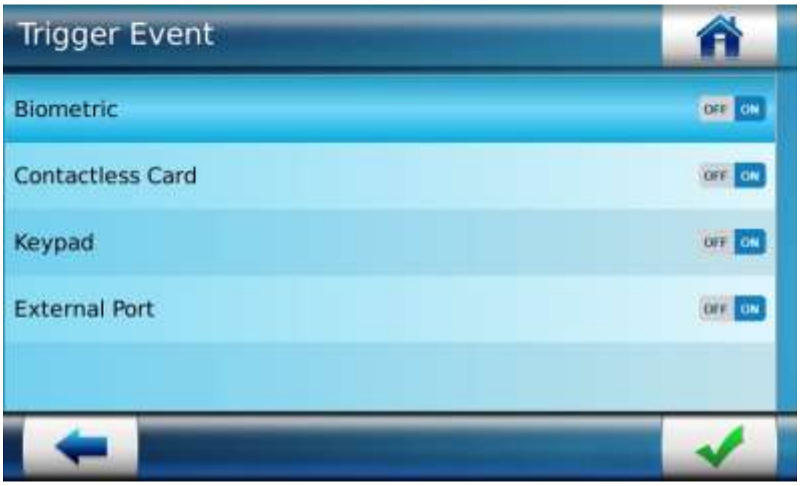
MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal will begin checking for access rights upon the occurrence of a specific event on the terminal. By setting these configurations the administrator can define as to when the terminal would commence performing access checks. The administrator can chose from the following events.

- **Biometric**, a finger is detected on the biometric sensor (which starts biometric identification process)
- **Contactless card**, a contactless card is detected, which starts authentication process using user's data found on the card
- **Keypad**, a User ID is entered with the keypad
- **External Port**, a User ID is received on Wiegand or Clock and Data input port.
- **QR code,** a QR code is detected and the authentication process starts with the User ID parsed from the QR code

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant > Trigger Event ***OR*** Security Menu > User Control Settings > Trigger Event	✓	✗

Screens & Steps



Trigger Event

Biometric OFF ON

Contactless Card OFF ON

Keypad OFF ON

External Port OFF ON

Figure 16: Selecting the event(s) that starts access control rights check process

1. The administrator can select from the above stated events. The event can be selected to be ON or OFF.
2. Click on the Check button "✓" to save settings

Language Configuration

The administrator can select the language of the terminal's display by using this functionality. Multiple language options are available to select from, e.g. English, French, Spanish and Arabic.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant > Language Configuration ***OR*** Home Screen > Language	✓	✕

Screens & Steps

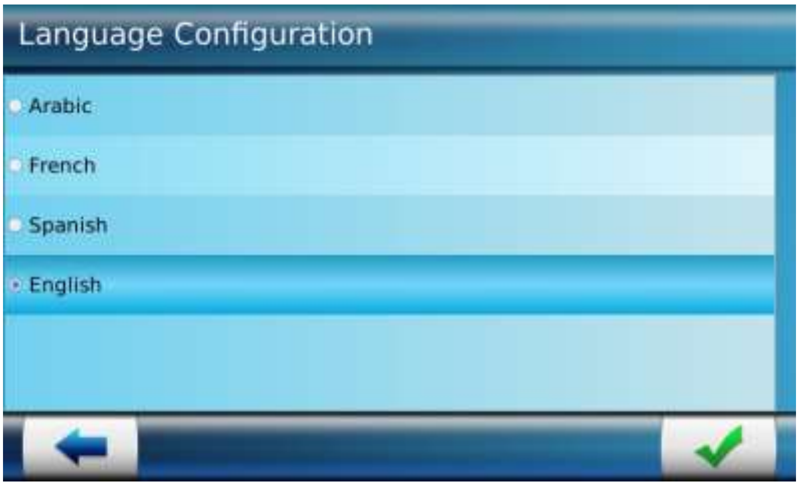
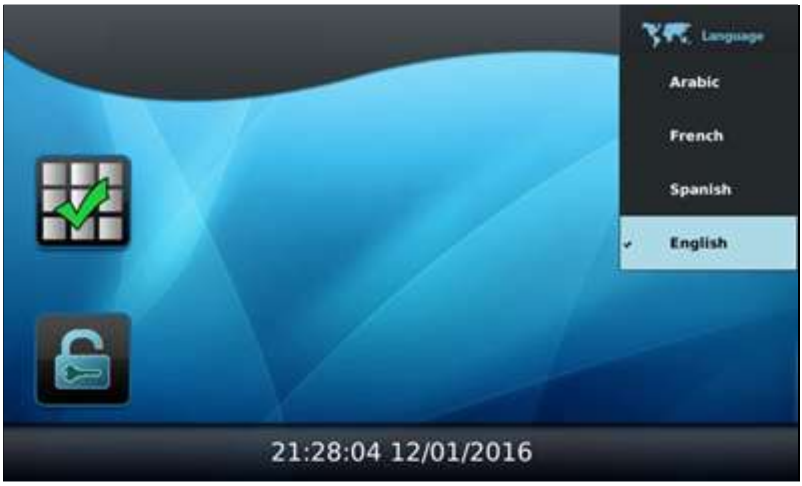


Figure 17: Configure Language

1. On the FBA screen, the administrator needs to select **Language Configuration**
2. 'English' is the default language selected
3. The administrator can select from the language options such as Arabic, French, Spanish or English
4. Click on the Check button "✓" to save the setting



Press Language to select

Figure 18: Language selection on main screen

1. On the Home Screen, the administrator can select from the language options such as Arabic, French, Spanish or English.

Results

The preferred language is saved. The text display on the screen will be in the language selected by the administrator.

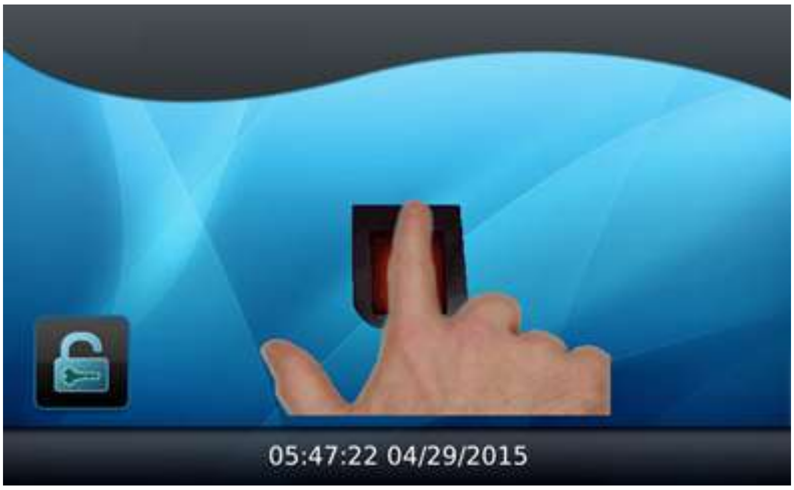
Note: The administrator must ensure that the audio messages played on the terminal must be in the same language as the one chosen. Administrator needs to upload the audio files from "Audio Settings" under Multimedia menu.

Show/Hide Language Icon

The administrator can chose whether to display the language icon on the home screen or not. This can be done via the Web Server application. The value of this parameter (misc.language_config_display) can be 0 or 1. The language icon will not be displayed on the home screen if the administrator sets misc.language_config_display to 0. The default value of this parameter is '1'.

Access Path

Web Server > Complete Configuration > misc.language_config_display



Language icon is hidden

Figure 19: Hide Language Icon

Ethernet Interface Settings

The administrator can connect MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal to other servers and door panels via **Ethernet channel.** Using Ethernet connection, the terminal can make access request to the access controller and receive result message.

The administrator can configure the terminal to communicate through Ethernet channel by means of the FBA screen. An administrator can set the IP attribution protocol as DHCP or Static.

- The administrator needs to allocate the IP address of the terminal manually when the selected IP mode is 'Static'.
- When the administrator choses the 'DHCP' mode, the IP address is assigned automatically. There is no need to manually enter it. IP Mode is selected to be Staic , by default.

Access Path

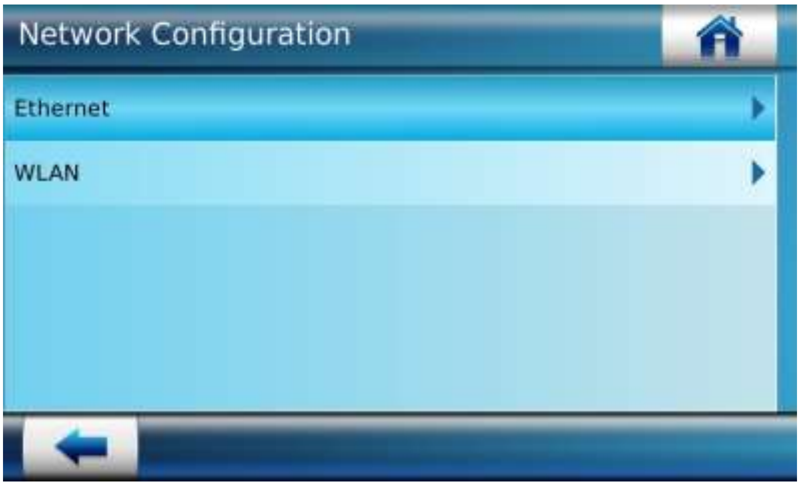
Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant > Network Configuration > Ethernet ***OR*** Communication Menu > Network Interface > Ethernet	✓	✗

NOTE:

Terminal can support connection through Ethernet and Wi-Fi™ both simultaneously.

Terminal can support connection through Ethernet and 3G/GPRS/GSM network simultaneously (for terminal supporting 3G/GPRS/GSM network).

Screens & Steps



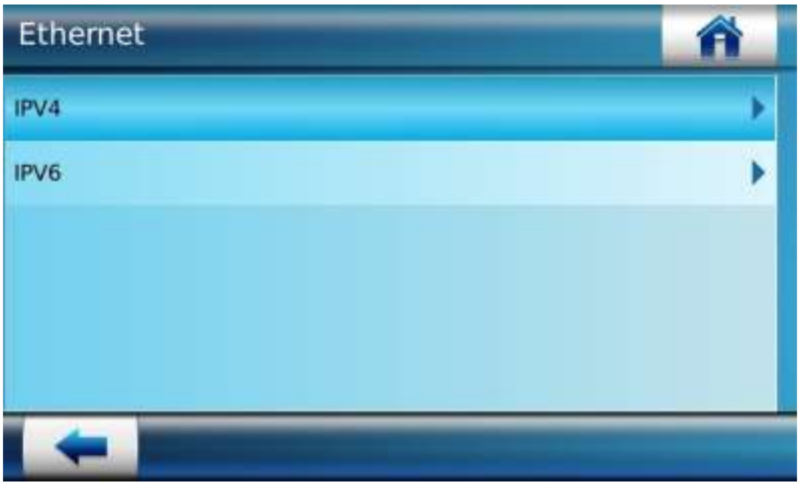
Network Configuration

Ethernet

WLAN

Figure 20: Selecting Ethernet-Network Configuration

1. Select **Ethernet**
2. Select **IP Configuration**



Ethernet

IPV4

IPV6

Figure 21: Ethernet Configuration

3. Under Ethernet tab, the administrator can select **IPV4** or **IPV6**
4. On next screen, default IP Mode is selected as DHCP. Press on **IP Mode** for update

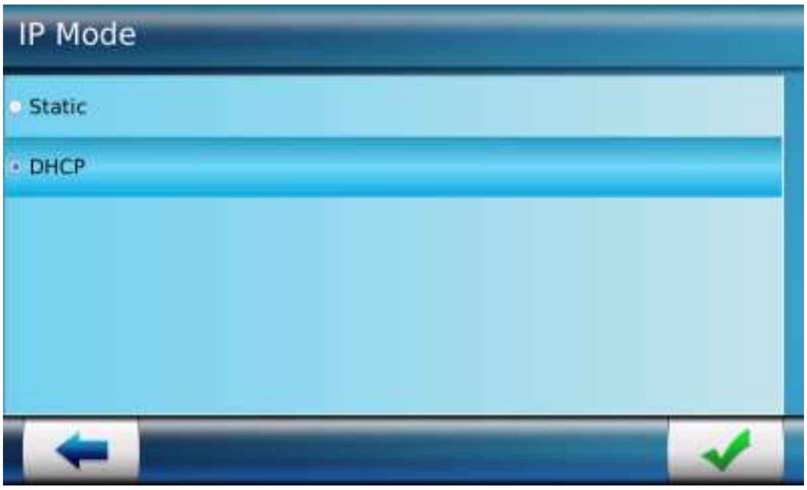
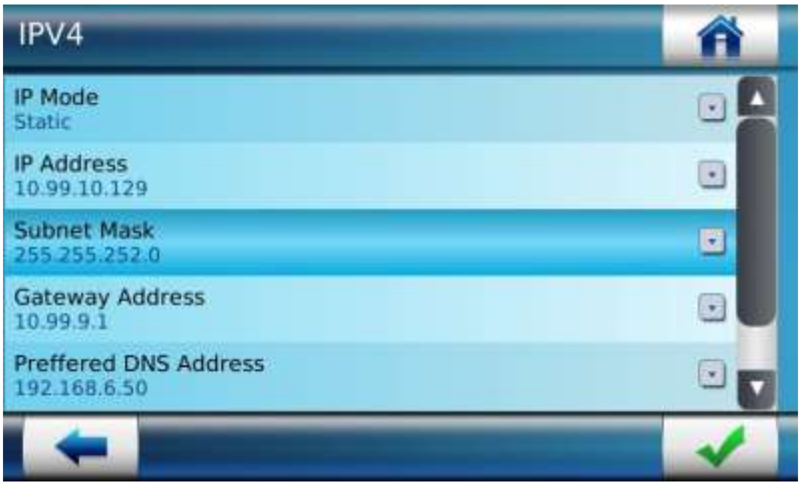


Figure 22: IP Mode Selection

5. An administrator can select **IP Mode** as ‘Static’ or ‘DHCP’
6. Use Check button “✓” to save the setting


IPV4

IP Mode
Static

IP Address
10.99.10.129

Subnet Mask
255.255.252.0

Gateway Address
10.99.9.1

Preffered DNS Address
192.168.6.50

Figure 23: Configuring IP Address under Static IP Mode

The administrator can manually configure ‘IP Address’ of the terminal, ‘Subnet Mask’, 'Network Mask', 'Gateway Address' and 'DNS Servers under the Static IP Mode.

Results

Once the Ethernet Configuration is done, the terminal can be connected to a distant server. An administrator can also configure parameters to prevent unauthorized access to the terminal. These settings can be done from Security menu, refer “*Network & Communication Security Settings*”.

Wi-Fi™ Configuration

The administrator can connect MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal to other servers and door panels via **WLAN (Wi-Fi™ network).** Using Wi-Fi™ connection, the terminal can make access request to the access controller and receive result message.

The administrator can configure the terminal to communicate through WLAN by means of the FBA screen. There are two ways to configure WLAN:

- **Automatic:** Administrator can select a 'specific' network from the list of available networks and connect by entering the encryption key.
- **Manual:** The administrator can chose the manual configuration in order to connect to a hidden Wi-Fi™ network. This can be done by entering SSID, Encryption Mode and Encryption Key.

Access Path

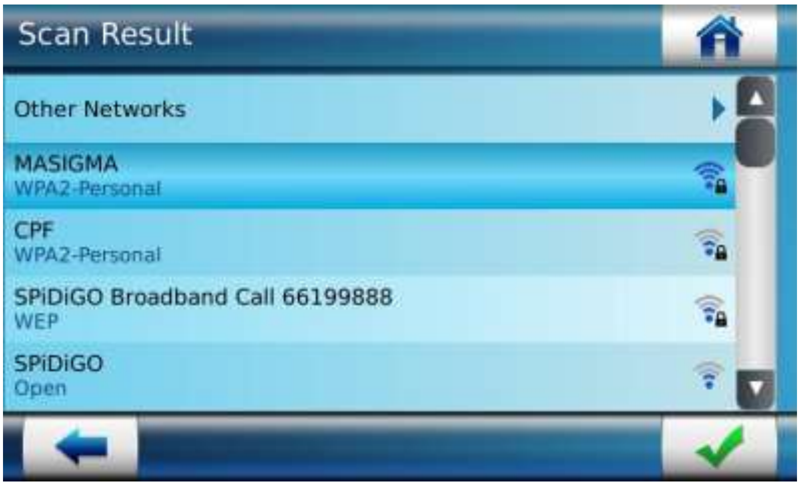
Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant > Network Configuration > WLAN ***OR*** Communication Menu > Network Interface > WLAN	✓	✗

Pre-requisites

- Administrator must ensure that the Wi-Fi™ USB dongle is plugged in.
- Administrator must ensure that the MA_WI-FI™ license is installed on terminal

Screens & Steps

Automatic Configuration

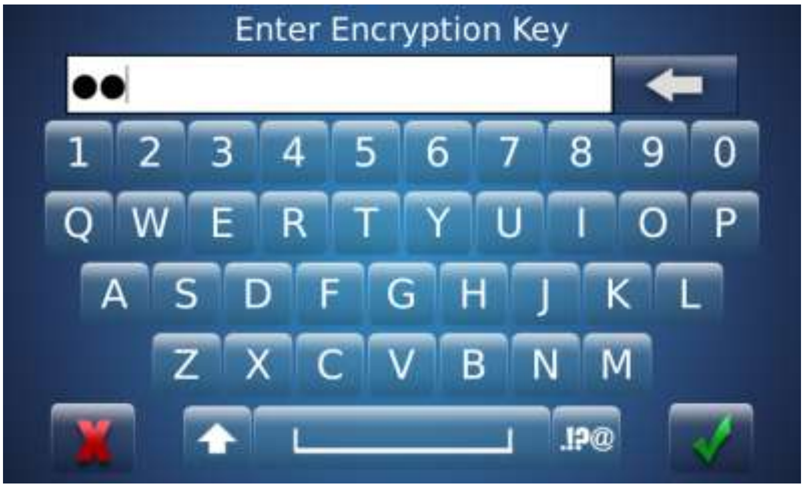


Scan Result

Other Networks	
MASIGMA WPA2-Personal	
CPF WPA2-Personal	
SPiDiGO Broadband Call 66199888 WEP	
SPiDiGO Open	

Figure 24: Selecting available Wi-Fi™ network

1. Select from the list of scanned Wi-Fi™ networks

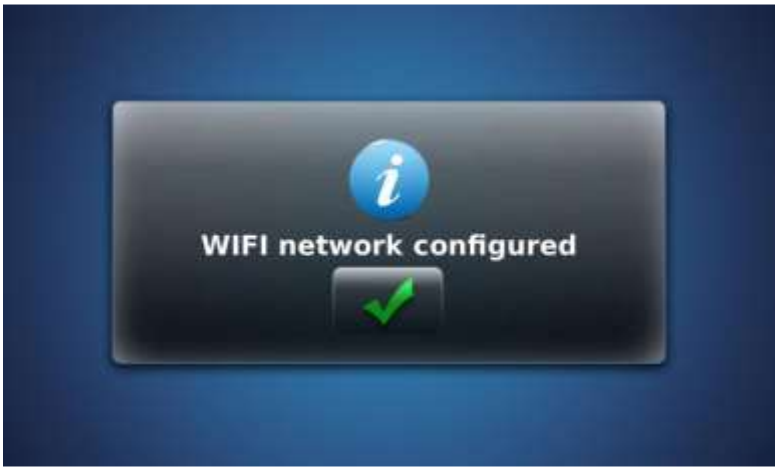


Enter Encryption Key

●●

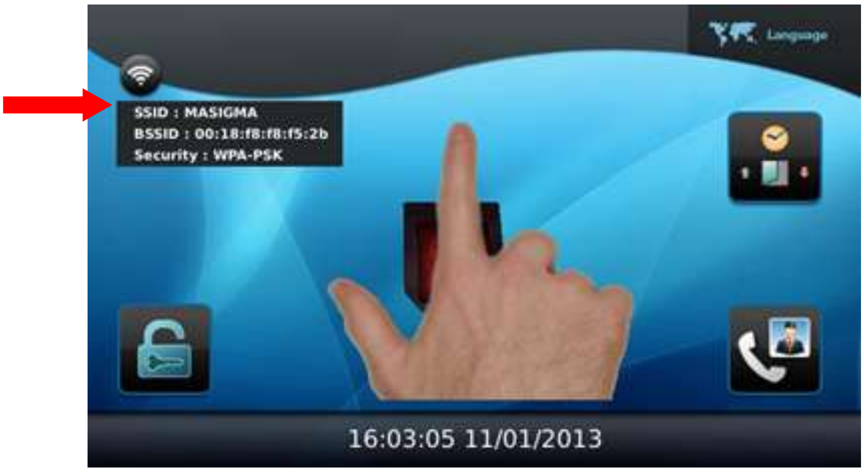
Figure 25: Enter Encryption Key

2. Enter an **Encryption Key** to connect to the selected Wi-Fi™ network



WIFI network configured

Figure 26: Success message is displayed showing Wi-Fi™ network is configured

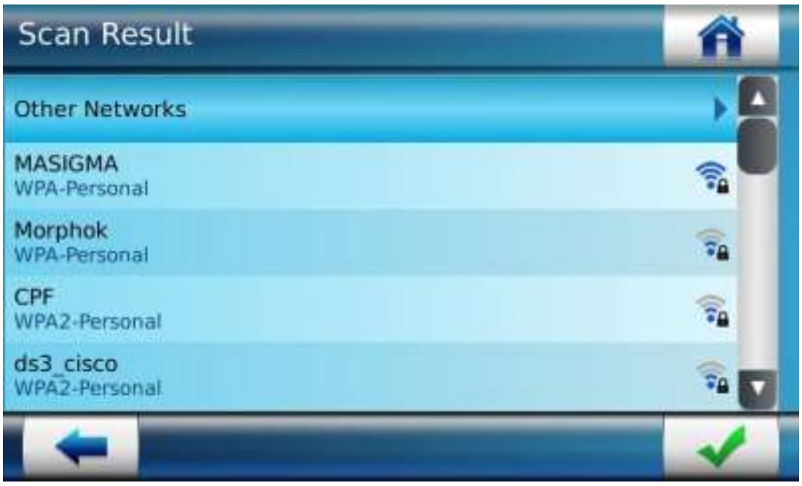


SSID : MASIGMA
BSSID : 00:18:f8:f8:f5:2b
Security : WPA-PSK

Figure 27: Connected to Wi-Fi™ network

Manual Configuration

1. Select **WLAN Configuration** to set up Wi-Fi™ Network



Scan Result

Other Networks

MASIGMA
WPA-Personal

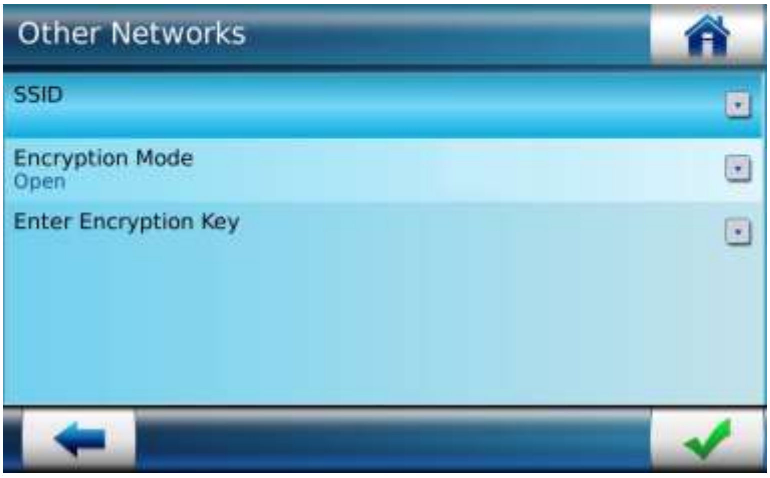
Morphok
WPA-Personal

CPF
WPA2-Personal

ds3_cisco
WPA2-Personal

Figure 28: Selecting Other Network to set up Wi-Fi™ network manually

2. The list of available Wi-Fi™ networks will be displayed. Select **Other Network** to set up Wi-Fi™ network manually



Other Networks

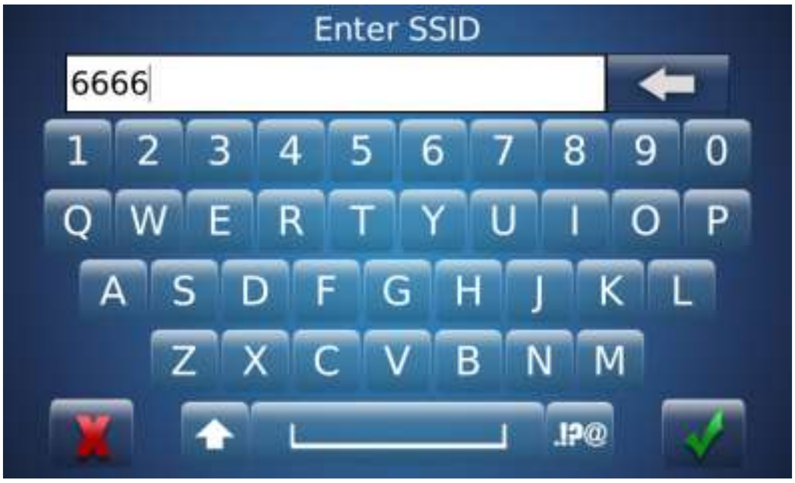
SSID

Encryption Mode
Open

Enter Encryption Key

Figure 29: WLAN Parameter Configuration

3. Under the Other Networks tab, the administrator needs to configure **SSID**, **Encryption Mode** and **Encryption Key** provided by the Wi-Fi™ network provider


Enter SSID

6666

Figure 30: Setting SSID

4. Enter **SSID** and click on "✓" button to save. To cancel the operation, use "✗" button

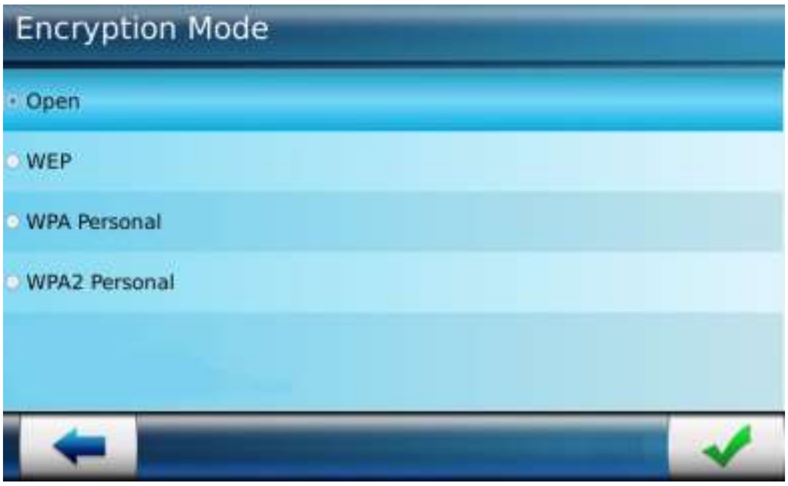

Encryption Mode

Figure 31: Selecting Encryption Mode

5. The administrator needs to select the **Encryption Mode**, as supported by a Wi-Fi™ Router. In order to avoid unauthorized access, Encryption mode is selected. The available Encryption modes are:
   a. Open (no encryption)
   b. WEP
   c. WPA Personal
   d. WPA2 Personal

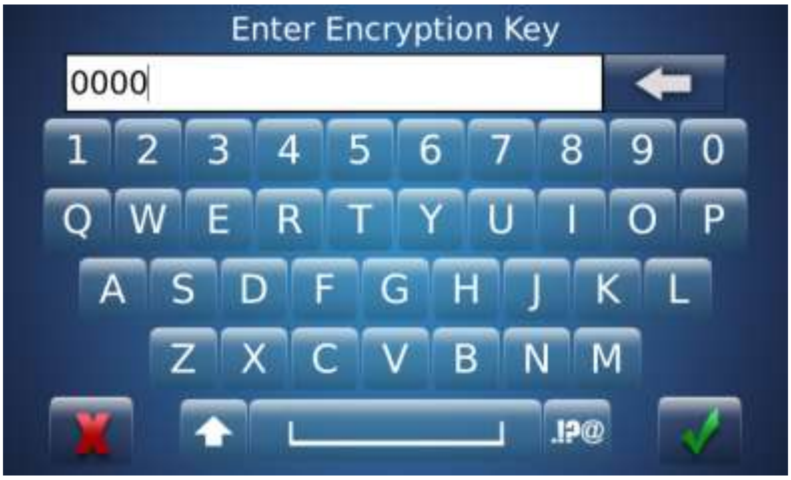


Figure 32: Define Encryption Key

6. Administrator needs to enter Encryption Key to connect to Wi-Fi™. Only by entering Encryption Key, the Wi-Fi™ network can be accessed
7. Click on the Check button "✓" to save the setting

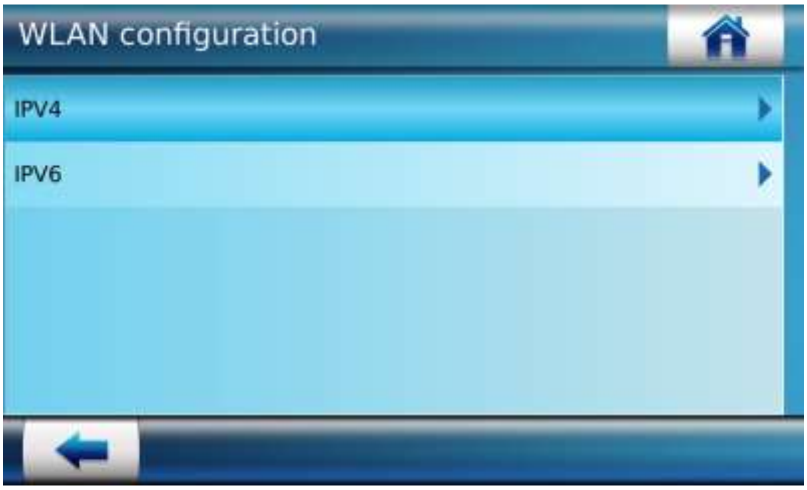
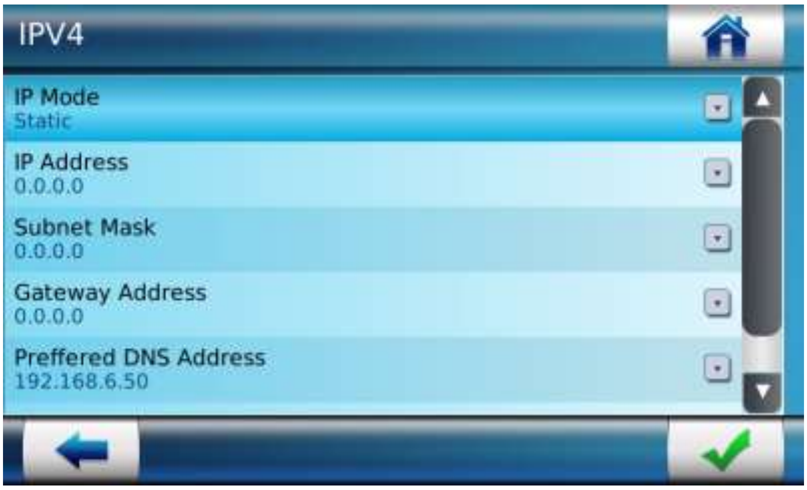


Figure 33: Entering in WLAN – IP Configuration

8. On WLAN screen select "IP Configuration" to set up the IP which is required to be connected through WLAN
9. Select **IPV 4** or **IPV 6**


IPV4

IP Mode
Static

IP Address
0.0.0.0

Subnet Mask
0.0.0.0

Gateway Address
0.0.0.0

Preffered DNS Address
192.168.6.50

Figure 34: WLAN – IP Configuration

10. An administrator can select **IP Mode** as ‘Static’ or ‘DHCP’
    a. If IP Mode is ‘Static’, then enter parameters such as IP Address, Subnet Mask, Gateway Address, Preferred DNS Address and Alternate DNS Address
    b. If IP Mode is ‘DHCP’, then IP address is allocated automatically to the terminal
11. Click on the Check button “✓” to save the setting

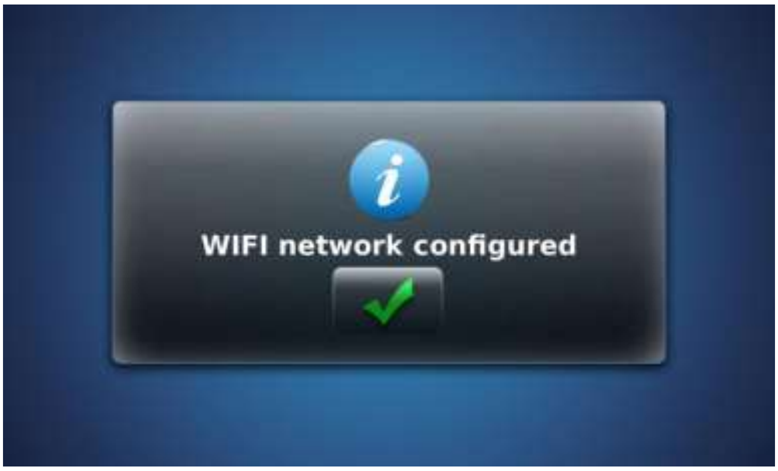

WIFI network configured

Figure 35: Success message is displayed showing Wi-Fi™ network is configured

Password Configuration

The administrator can use this function to reset the default login password of the terminal. The administrator can use this password to access the administration menu and perform required configurations. It is highly recommended to change the default login password in order to avoid any unauthorized access to the administration menu of the terminal.

The administrator must change the login password periodically to ensure better security. The administrator can change password anytime from "*Change LCD Password*" under Security Menu.

The password is a numeric value with 4 digits minimum and 8 digits maximum.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant> Password Configuration ***OR*** Security Menu > Communication > Change LCD Password	✓	✗
WebServer	Welcome Admin > Change password	✓	✓

Screens & Steps

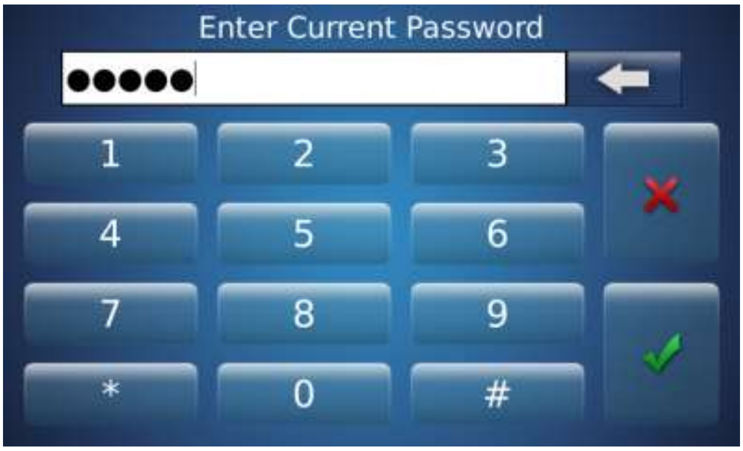
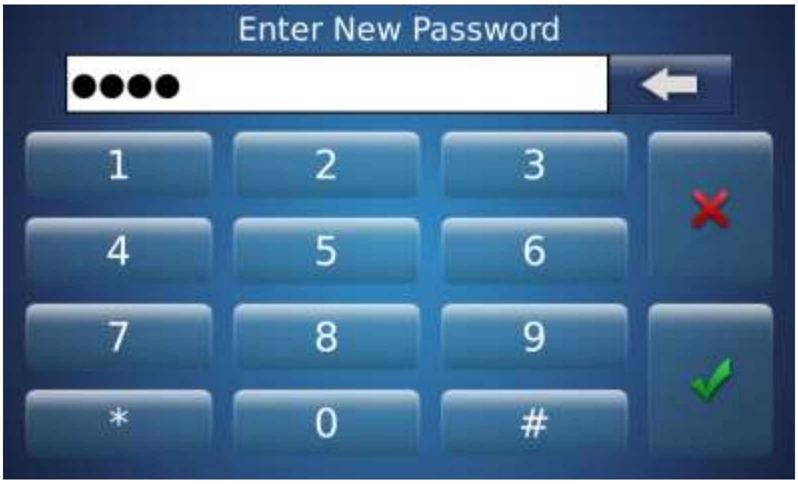


Figure 36: Resetting Device Password

1. Administrator needs to enter **Current Password** and use “✓” button to move on next screen. By default, the login password of the terminal is set as “12345”

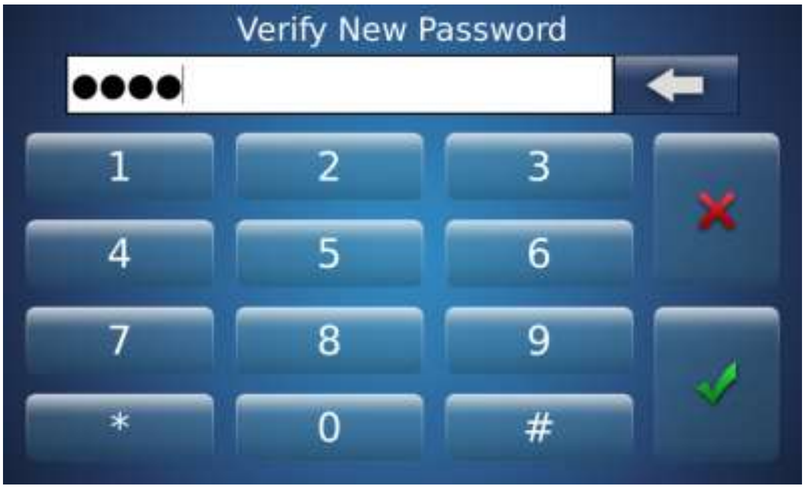


Enter New Password

●●●●

Figure 37: Entering New Password

2. Enter a **New Password** of your choice.
3. Use “✓” button to move on next screen



Verify New Password

●●●●

Figure 38: Verifying New Password

4. Administrator needs to re-enter the **New Password** for verification
5. Use “✓” button to **Save**

Results

The administration menu of the terminal can be accessed now by entering the new password.

First Boot Assistance At Next Boot Configuration

The configuration defined with the First Boot Assistant, can be either permanent or temporary. This is specified by the "First Boot Configuration Storage Type" parameter as described below:

- **ON**: If the administrator sets this to ON, then at the next startup of the terminal, the First Boot Assistant (FBA) screen will be displayed with the configurations stored. User can change the required parameters.
- **OFF**: If the administrator sets this to OFF, then at the next startup of the terminal, the First Boot Assistant (FBA) screen will not be displayed and the configurations stored previously will continue to apply.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > First Boot Assistant > First Boot Assistance At Next Boot	✓	✗

Screens & Steps

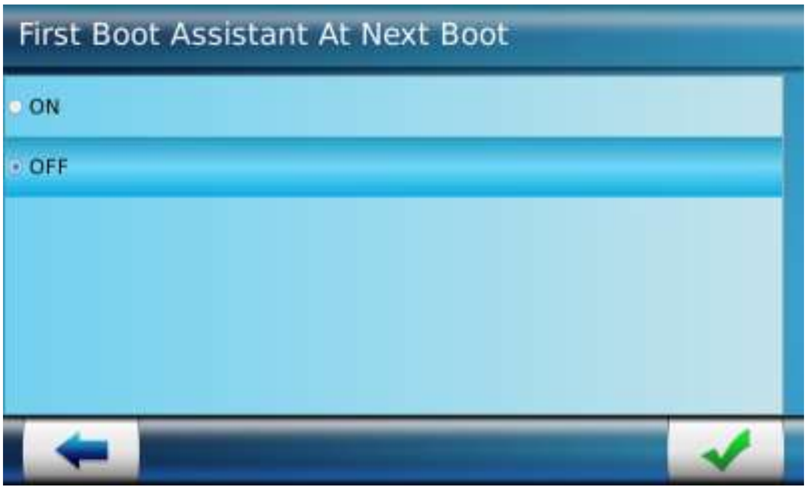


Figure 39: First Boot Assistance At Next Boot

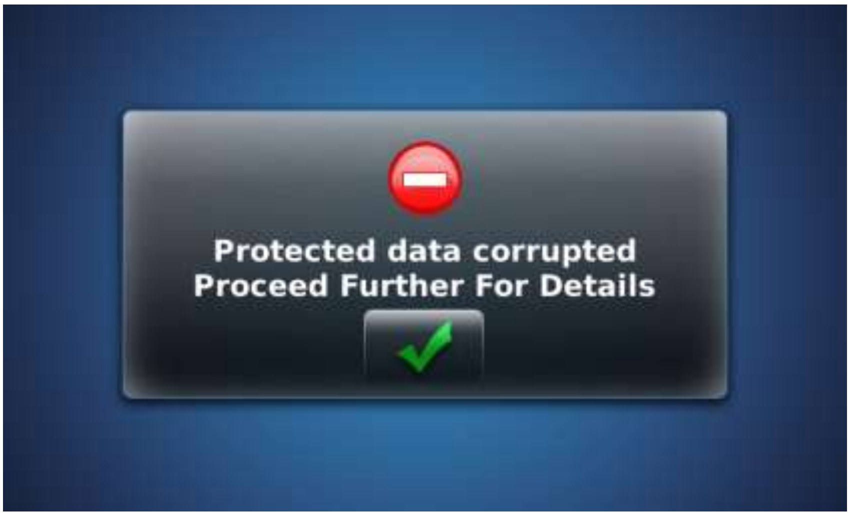
1. Select ON or OFF
2. Use Check button “✓” to save the setting

Results

The preferred value of “First Boot Assistant At Next Boot” is saved. The terminal will display FBA menu, based on the value this parameter.

Recover Corrupted Components

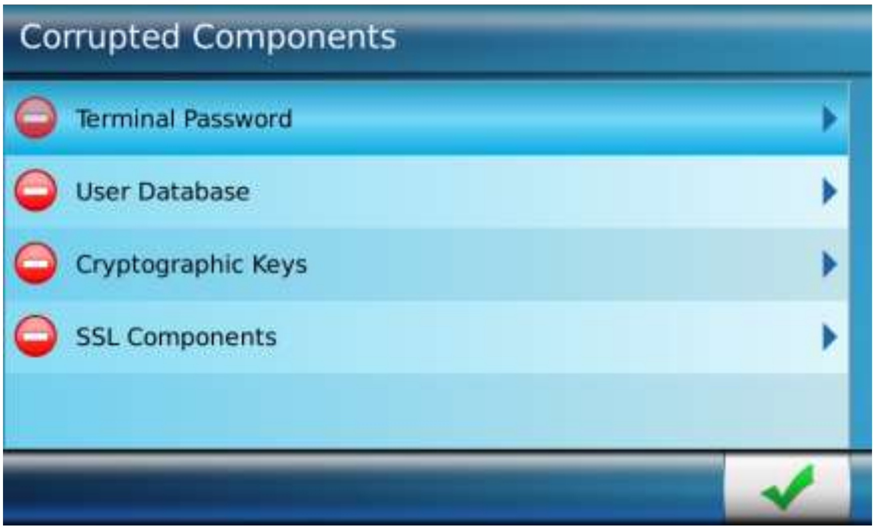
There is a mechanism in the terminal to recover corrupted data such as Smartcard Keys, Terminal Password, SSL Certificate and User Database. This could have been corrupted in the event of a power failure or interrupt in ongoing operation. When booting up the terminal device, if corruption is detected in any of these data security components, the following message will be displayed on the screen.



Protected data corrupted
Proceed Further For Details

Figure 40: Protected Data Corrupted Error

The administrator can view the list of corrupted components by clicking on "✓". This has been illustrated in the snapshot below



Corrupted Components

- Terminal Password
- User Database
- Cryptographic Keys
- SSL Components

Figure 41: Corrupted Components

The corrupted components will restore to default values when the administrator selects "✓".

Section 5 : **Terminal Administration Menu**

Access to Administration Menu

The administrator can login to MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal using a default password. The administration menu allows user to perform various actions and configurations on the terminal, through the categories of menu listed below. This section is about configurations that can be done via the terminal menu for MorphoAccess® SIGMA Family Series and the *MorphoWave®* Compact.

- **User Menu**: For enrolling and managing users
- **Multimedia Menu**: For uploading and managing Audio, Video and Images in the terminal
- **System Menu:** Allows configuration of the Terminal, Transaction Log and perform miscellaneous configurations.
- **Communication Menu**: For setting network interface and serial parameters.
- **Security Menu**: Allows the administrator to configure Biometric, Communication, Multi-user verification, LCD password change and additional user control
- **USB Menu**: Allows initialization of USB, the import and export data using USB.
- **Information Menu:** Used for viewing information of terminal.
- **Reboot Product:** The administrator can reboot the terminal from here.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Home Screen	✓	✗

Screens & Steps

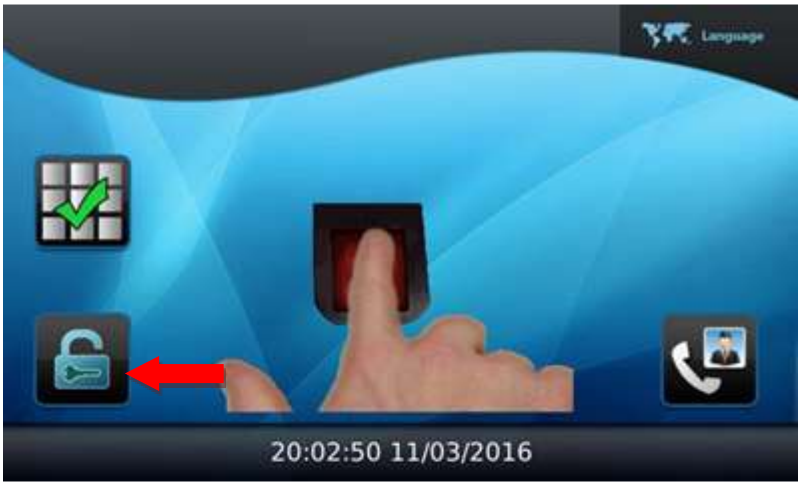


Figure 42: Logging in Device

1. Press on **key lock** icon

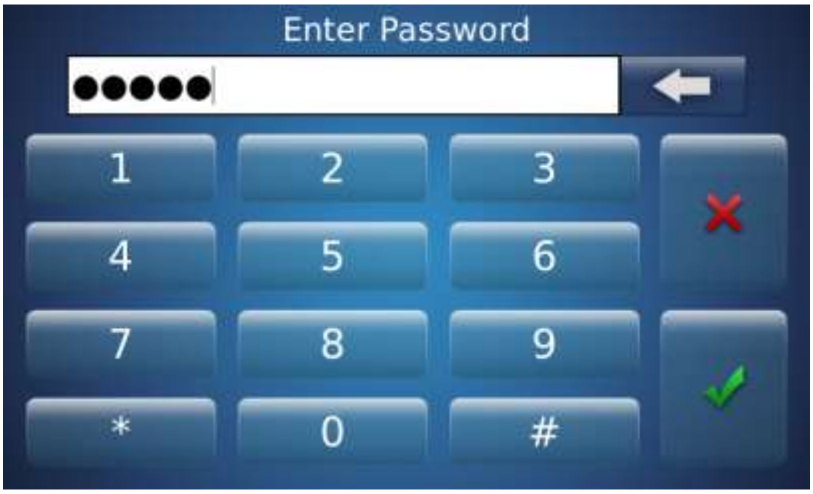


Figure 43: Entering Password

2. Enter **Password** and Press on validation button ✓

NB Identification policy depends of misc.LCD_login_optionvalue :

0 - Password only (***0** - Default)*
1 - ID + Password
2 - ID + BIO + Password
3 - ID + BIO

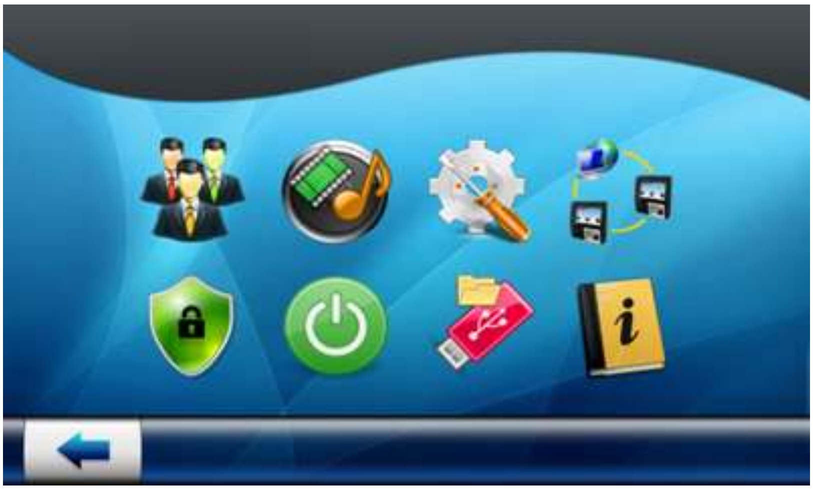


Figure 44: Administrator Menu

3. On successful login, The administration menu is displayed along with the various sub menus

User Menu

User menu offers all functions related to the end users. An administrator can use this to enroll new user in the system, edit user information, delete users from the terminal database, and reset user information from contactless smart cards.

The administrator can only access this menu if enrolled with either Full Administrator Rights or Database Administrator Rights or Limited Database Administrator Rights.

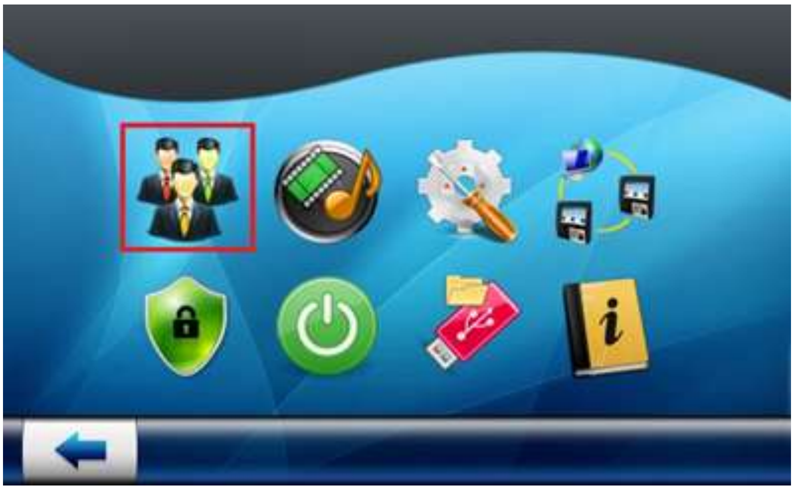


Figure 45: User Management Menu

User Enrollment in Database

By using this feature of MorphoAccess® SIGMA Family / *MorphoWave®* Compact terminal, the administrator can enroll new users in the terminal. The user information such as name, biometric data (e.g. fingerprint), User ID and PIN, access rights, etc. can be entered and stored in the terminal database.

Terminal will allow access to the user by comparing the data provided by the user at the time of access request, with the data provided by the user at the time of enrolment.

Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series	SIGMA Lite Series	MorphoWave ® Compact
Terminal Menu	User Menu > Add/Enroll User > Only DB	✓	✗	✓
User Management Menu of the Webserver	User Management > User Enrollment > Enrollment mode > DB Only	✓	✓	✓

Pre-requisites

- Only an Administrator with ‘Full Admin Rights’ or ‘Database Admin Rights’ or ‘Limited Database Admin Rights’ can enroll new users
- The following sections and screenshots are for MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminal only.

Screens & Steps

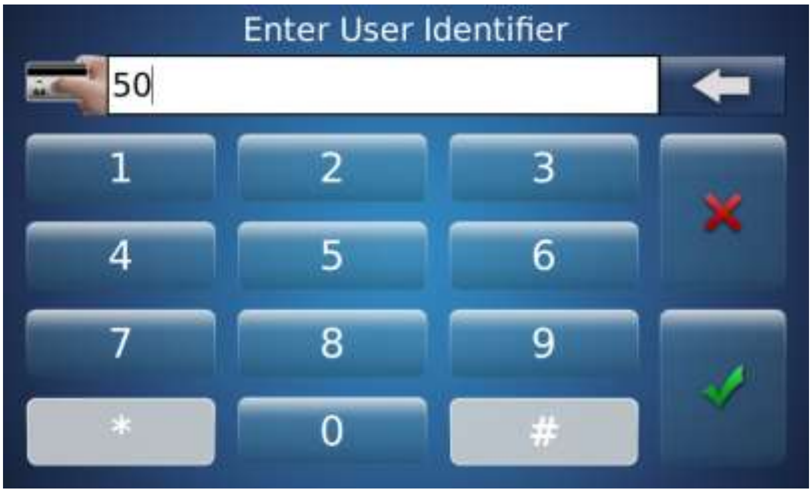


Figure 46: Entering User Identifier

1. Enter **User Identifier (User ID)**. Numeric value up to 24 digits.

NOTE:

- Wiegand protocol doesn't support special characters such as "*" and "#", then is not recommended to insert these characters in the User ID value.
- There is a configuration key, **misc.user_id_edit**, to make user ID field read only. With this parameter, the user id can be extracted from the Smartcard and restrict user to edit this field. **misc.user_id_edit** is accessible from PC application or Web Server**.**

2. Press on "✓" button to save

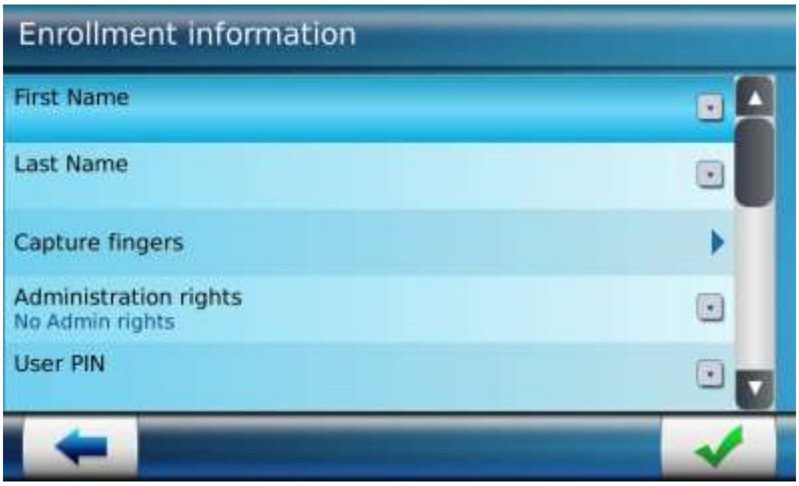
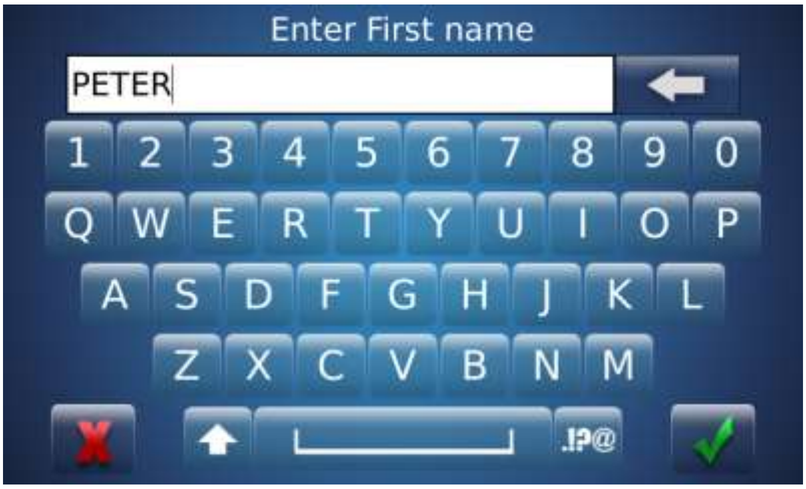


Figure 47: Adding user information

3. Under **Enrolment Information** screen, an administrator needs to enter several parameters:


Enter First name

PETER

Figure 48: Enter First Name of User

4. First Name of user and Press on "✓" button to move to the next screen.
5. Similarly, on next screen, Enter **Last Name** of user and Press on "✓" button to move to the next screen.
6. Press on **Capture Fingers** to enroll fingerprints of the user

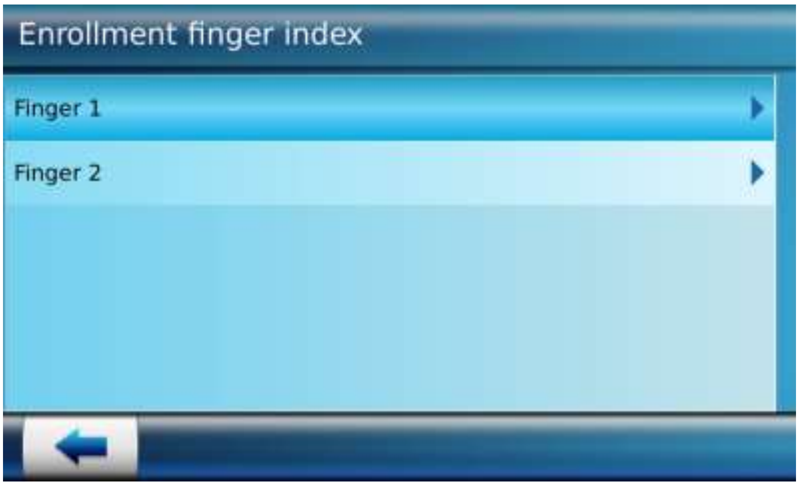


Figure 49: Enrolling Finger Index

7. A user is required to provide the biometric data of at least two different fingers. Select first finger for biometric data capture

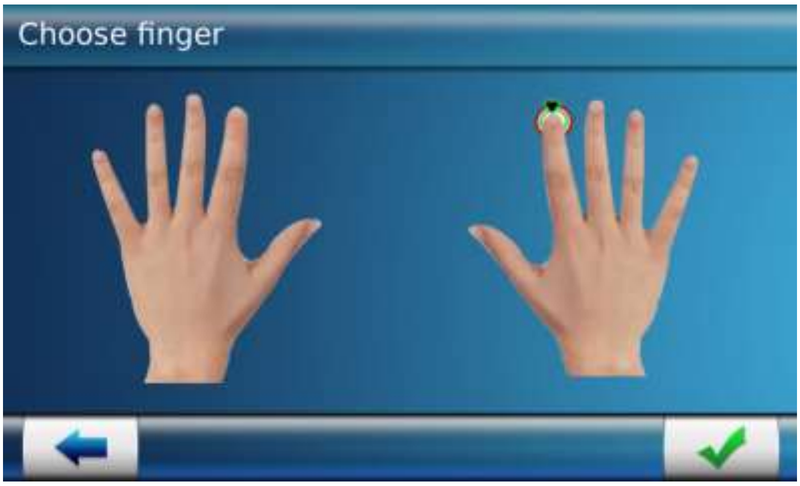


Figure 50: Select first finger to capture

8. Select finger for biometric data capture

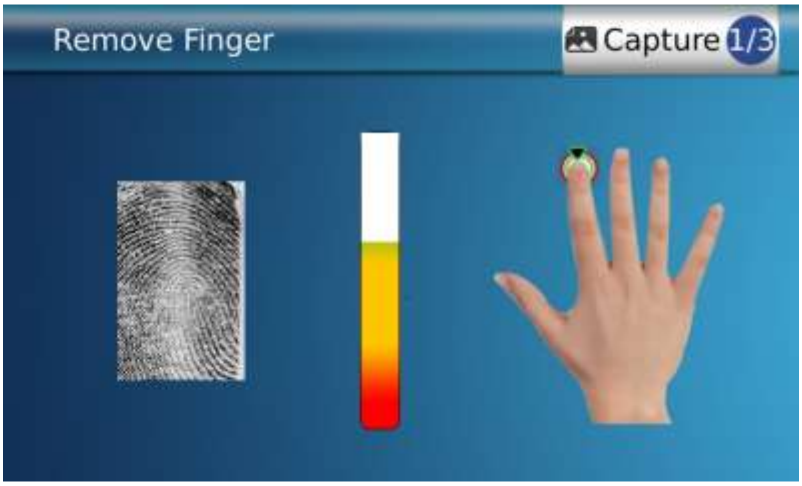
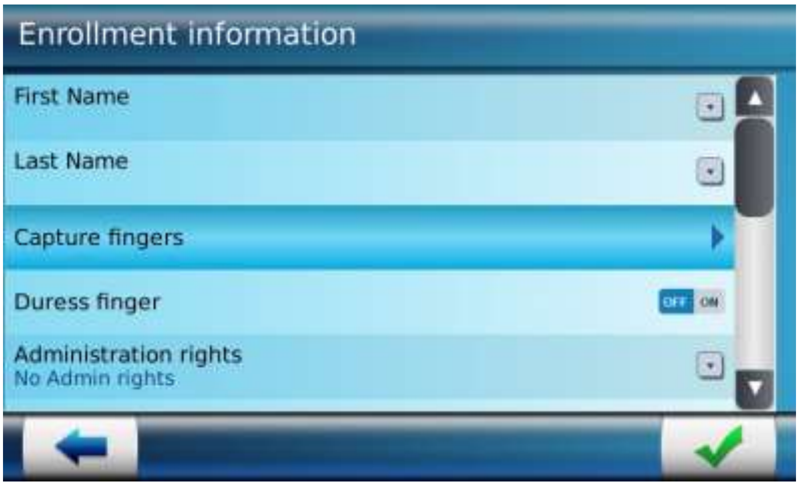


Figure 51: Biometric data capture

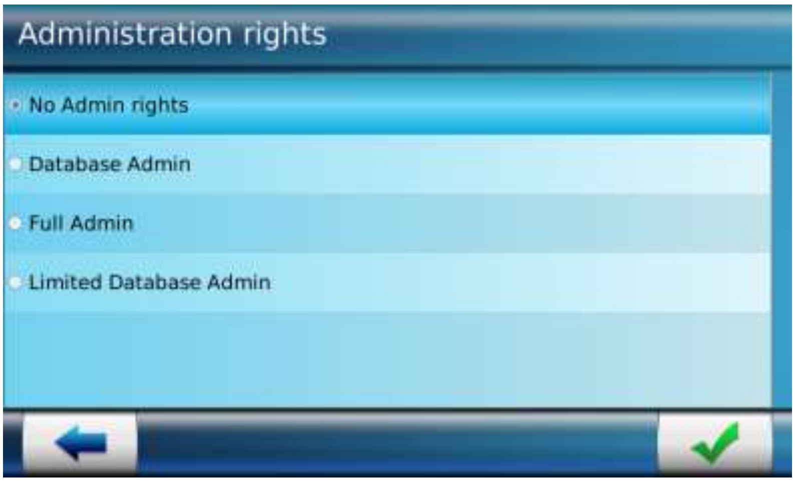
9. Place user's finger on **biometric Sensor**. If finger is not placed properly or within the time limit, an error message is displayed. Refer to "*SIGMA Family Series* Finger Placement Recommendation" section to know the correct position of finger.
10. Fingerprint is captured three times and the best quality image is auto-selected by the terminal
11. Once the fingerprint is stored, the administrator will be redirected to enrolment finger index screen, wherein the second finger should be selected for capture, The administrator needs to repeat steps 8 to 10 for enrolling finger 2



Enrollment information

Figure 52: Set Duress Finger as ON

12. Once the administrator completes capturing fingerprints of the first and second finger, an option for capturing **Duress Finger** is enabled.
13. The administrator needs to select **ON** if it is required to capture duress finger. Follow steps 8 to 10, for enrolling duress finger



Administration rights

Figure 53: Assigning Access Rights

14. **Admin Rights** enables the administrator to select the ‘rights’ that can be given to the user.
    a. **No Administrator Rights:** The user is a regular user who has no right to access administration menu or modify the terminal configuration.Regular users can only use the terminal for requests of Access and/or Time & Attendance.
    b. **Database Admin:** The user is an administrator with database administration rights.He or She is capable of accessing User menu and performing all available actions in the User menu, except for **Update Admin Rights** operation.

c. **Full Admin:** The user is an administrator with full Admin Rights. He or she can access all the menus in the administration menu and perform operations. An administrator with full Admin Rights can enroll regular users, as well as administrators.

d. **Limited Database Admin:** The user is an administrator with limited database administration rights. He or she is capable of accessing User menu and performing all available actions in the User menu, except for **Edit User**, **Delete User or Update Admin Rights** operation.

The following tables sum up available features according to the administrator profile :

- User related features

Profile	User Menu					
	Add	Edit	Delete	Authenticate	Card manager	Update admin rights
No Admin right	✗	✗	✗	✗	✗	✗
Limited Database Admin	✓	✗	✗	✓	✓	✗
Database Admin	✓	✓	✓	✓	✓	✗
Full Admin	✓	✓	✓	✓	✓	✓

- USB related features

Profile	USB Menu								
	Initialize	Format	Import			Export			
			User Database	Contactless Key	Language	Transaction Log	Error log	User Database	Contactless key
No Admin right	✗	✗	✗	✗	✗	✗	✗	✗	✗
Limited Database Admin	✗	✗	✗	✗	✗	✗	✗	✗	✗
Database Admin	✗	✗	✗	✗	✗	✗	✗	✗	✗
Full Admin	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Others features

Profile	Multimedia Menu	System Menu	Communication Menu	Security Menu	Reboot	Information Menu
No Admin right	✗	✗	✗	✗	✗	✓
Limited Database Admin	✗	✗	✗	✗	✗	✓

Database Admin	✗	✗	✗	✗	✗	✓
Full Admin	✓	✓	✓	✓	✓	✓

15. **Press** on “✓” to save setting

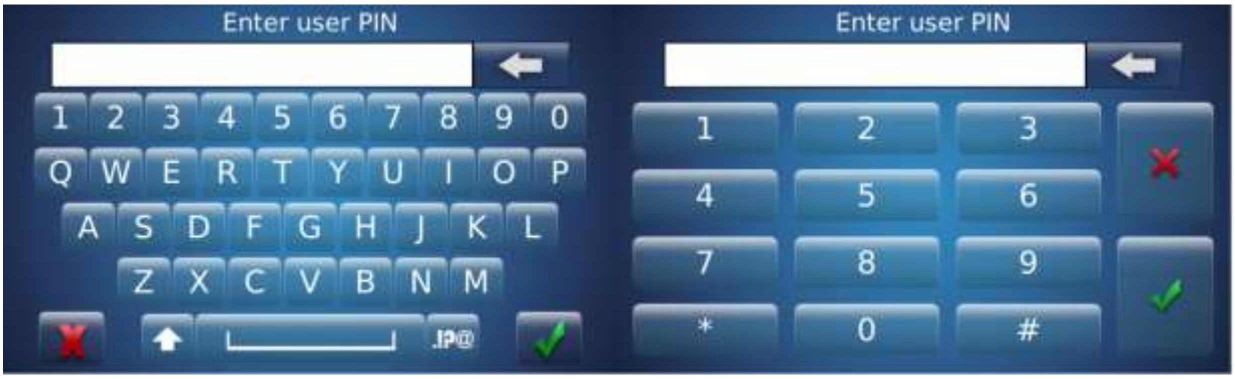
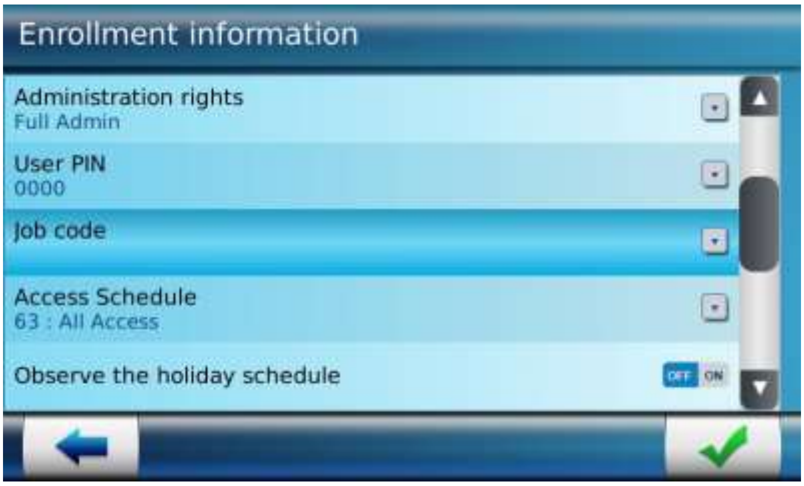


Figure 54: Enter User PIN – Alphanumeric/Numeric

16. The administrator has to enter **User PIN** which can be either numeric or alphanumeric based the *LCD_configuration.PIN_keypad_type*. Default value of this parameter is 1 which enables Numeric keypad for User PIN. On setting value to 0, terminal will enable Alphanumeric Keypad. The value will be of up to 15 digits alphanumeric/numeric. This PIN can be used by user, when PIN based authentication mode is enabled. The user will be required to enter PIN along with fingerprints, for authentication.

17. Press on “✓” to save setting


Enrollment information

Administration rights
Full Admin

User PIN
0000

Job code

Access Schedule
63 : All Access

Observe the holiday schedule OFF ON

Figure 55: Setting Job Code

18. The administrator can set a Job Code in a user profile. On access request, user has to enter job code along with fingerprint and PIN. Only on successful authentication of the user, the access is granted. Press on **Job Code**

NOTE:

1. The administrator can enable the Job Code as a parameter for authentication. This can be done from the Biometric Security tab.
2. When the Time and Attendance mode is enabled, entering job code during authentication is optional despite the Job Code Check being enabled. It is based on the value of parameter *time_and_attendance.jobcode_by_key* and selected time and attendance key during authentication.

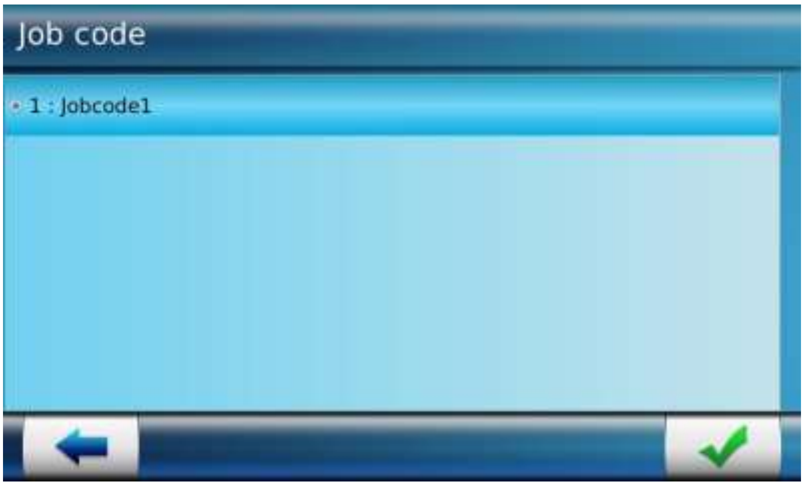
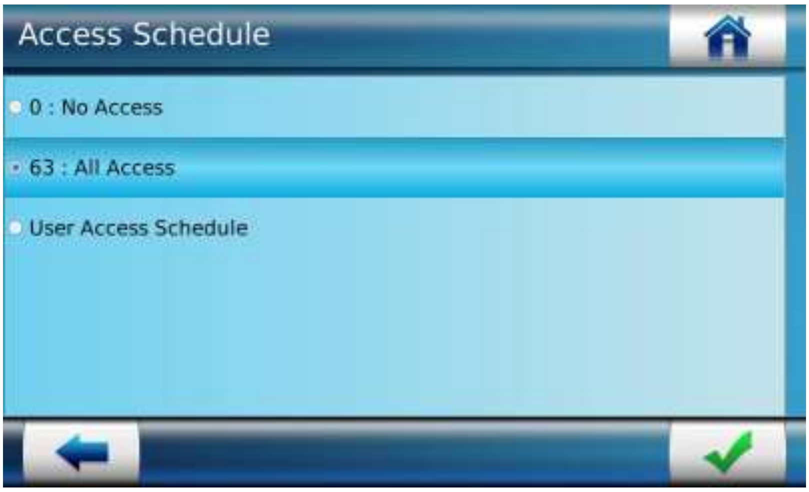


Figure 56: Setting Job Code in user profile

19. The list of Job Codes configured in terminal is displayed. An administrator can select a job code to associate with the profile.

NOTE: The Job Codes are configured in terminal using **MorphoBioToolbox**, webserver or distant command.

20. Press on "✓" to save setting



Access Schedule

○ 0 : No Access

● 63 : All Access

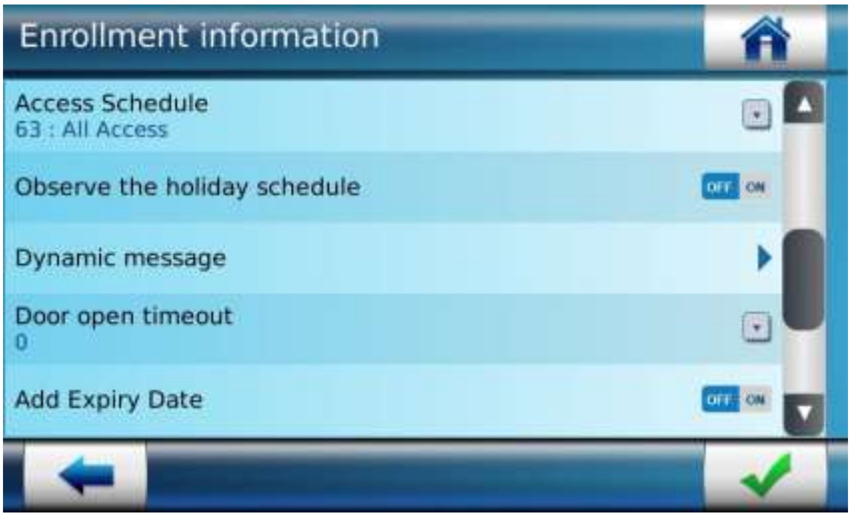
○ User Access Schedule

Figure 57: Assigning Access Schedule

21. The administrator can select an **Access Schedule**, if the access is to be allowed within a particular time period of the day. By default, the access schedule is selected as Schedule 63 which means access is allowed at any time of the day.

    NOTE: Refer to “*Define Access Schedules*” *and “Define User Access Schedule”* under Configuration through Webserver section to know more about access schedule.

22. Press on “✓” to save



Enrollment information

Access Schedule
63 : All Access

Observe the holiday schedule: OFF

Dynamic message

Door open timeout
0

Add Expiry Date: OFF

Figure 58: Enrolment Information Screen – Configuring parameters

23. The administrator can configure the **Observe Holiday Schedule** as ON or OFF. If this parameter is set as ON, then access on a holiday will be provided as per the defined holiday schedule. If this parameter is set as OFF, then authentication is done without any check on holiday schedule.

NOTE: Refer to "*Define Holiday Schedule*" under Configuration through Webserver section to know more about access schedule.

24. The administrator can select **Dynamic Message** as OFF or ON. Dynamic Message can include images or plain text. This message can be different for each user. This dynamic message will be displayed on the LCD screen on the occurrence of one or more user control events defined by "**dynamic_message.mode**" parameter. Please refer to **MorphoAccess® 5G Series – Parameters Guide** document for more details about this parameter. This dynamic mode configuration can also be done through webserver (refer section **Erreur ! Source du renvoi introuvable.**).

NOTE: It is a pre-requisite to attach an SD card to the terminal, in order to configure and use Dynamic Message functionality.

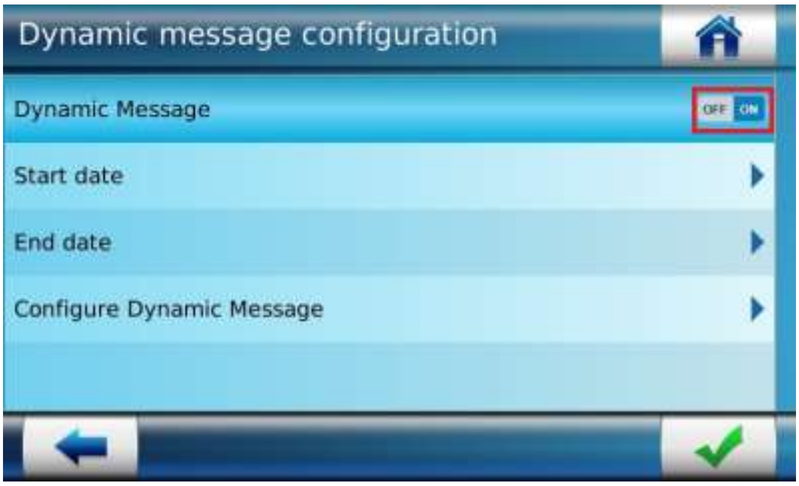


Figure 59: Configuring Dynamic Message for User

25. Set **Dynamic Message** as On

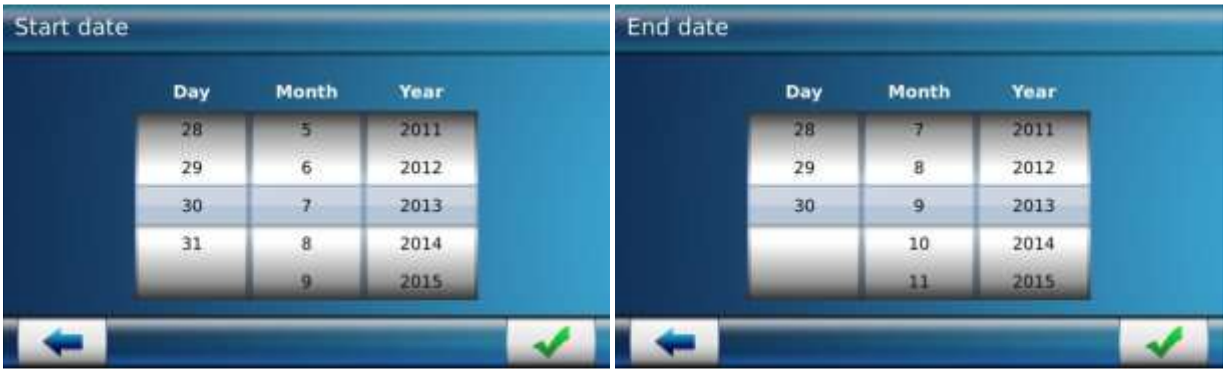
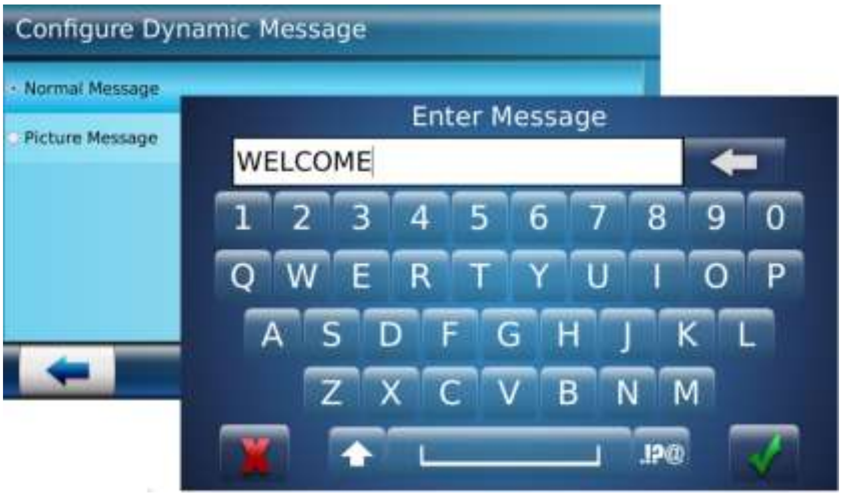


Figure 60: Setting duration for dynamic message

26. Select the duration for which the Dynamic Message is to be displayed on LCD screen by selecting the **Start Date and End Date**

27. Press on "✓" to save



WELCOME

Figure 61: Configuring Dynamic Message for User

28. The administrator can select the type of dynamic message as "**Normal**" or a "**Picture Message**"
    a. If Normal Message is selected, then on the next screen the message to be displayed, needs to be entered by the administrator. Press on "✓" icon to save message
    b. If Picture Message is selected, then the image uploaded in Multimedia Menu > Images will be displayed on terminal LCD screen every time when access is granted to the user.

NOTE: Refer to "*Images Settings*" section in this document to know how the dynamic message can be uploaded.

29. Press on "✓" to save

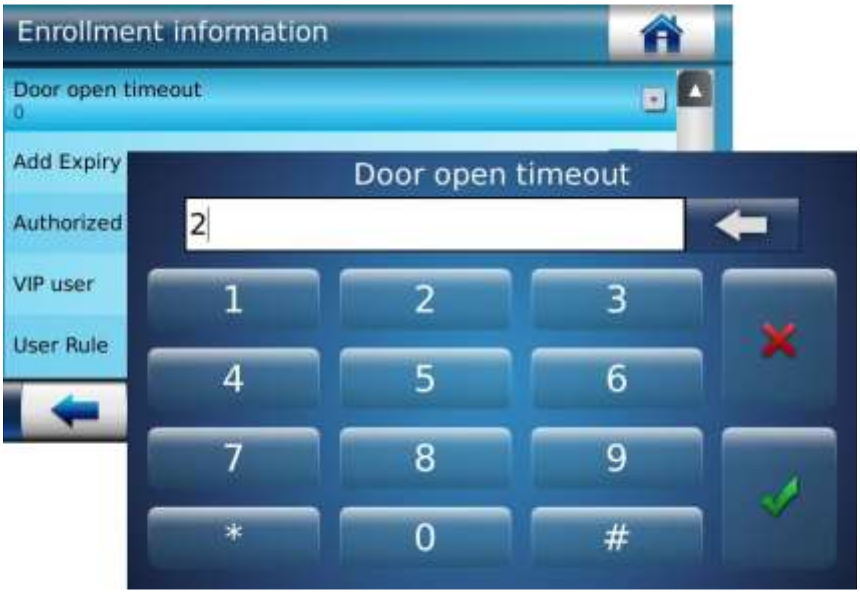


Figure 62: Configuring Door Open Time Out

30. The administrator can configure **Door Open Time Out** in seconds. The door stays open for the time duration defined here.

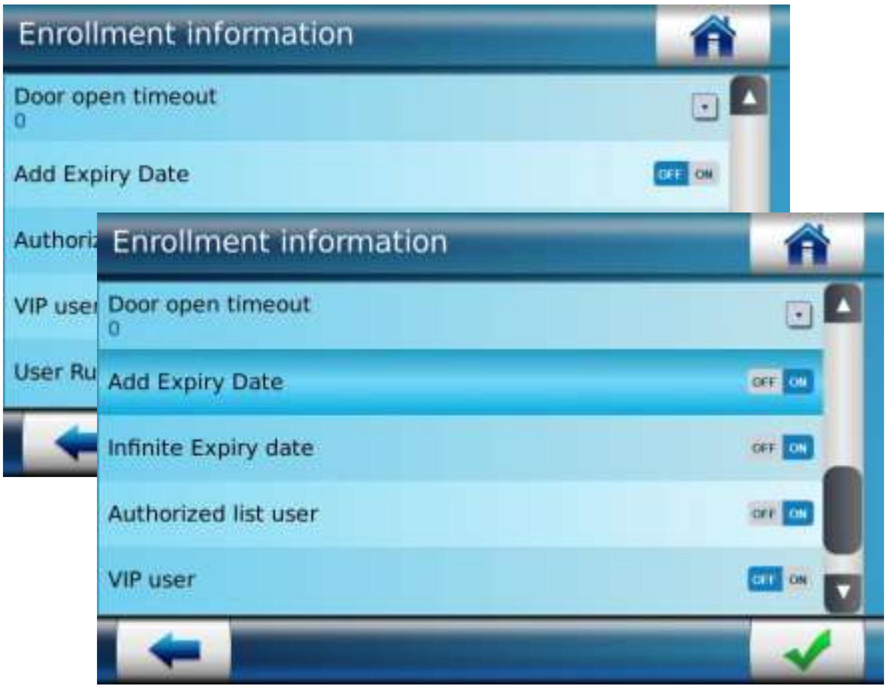


Figure 63: Enrolment Information Screen

31. The administrator can configure **Add Expiry Date** as ON or OFF. If **Add Expiry Date** is ON, then administrator can configure the user account expiry date parameter. This parameter indicates whether user account is active for specific duration or will remain active forever.

a. To apply Infinite Expiry Date, select **Infinite Expiry Date** as ON.

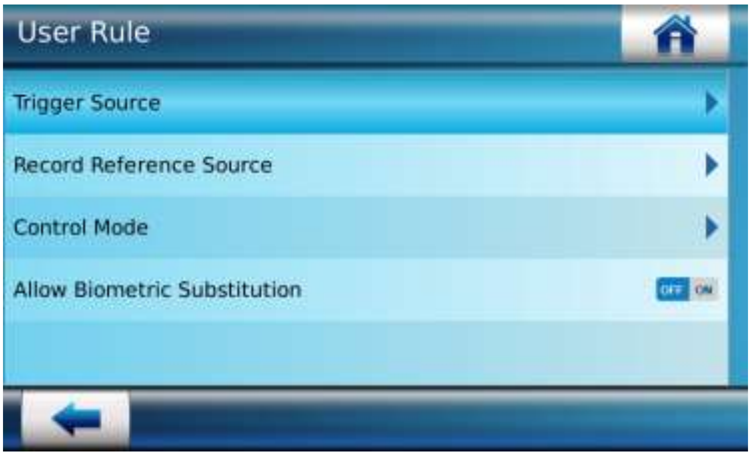
b. To apply specific Expiry Date, select **Infinite Expiry Date** as OFF and select **Expiry Date**

32. The administrator can configure **Authorized List User** as ON or OFF. Only if the user is in the Authorized list, access will be granted. This parameter is set as ON, by default.

NOTE: The authorized list parameter will be effective only if the parameter “Authorized List Check Mode” is set as ON, under Additional User Control settings.

33. The administrator can configure **VIP User** as ON or OFF. If the user is enrolled as a VIP user, then at the time of authentication, the terminal will not ask for biometric or PIN or BIOPIN.

34. The administrator can configure **User Rule**. This configuration panel allows the administrator to modify the general authentication rules that are applied to all users, into user specific settings.


User Rule

Trigger Source

Record Reference Source

Control Mode

Allow Biometric Substitution OFF ON

Figure 64: Defining User Rule

35. The User Rule settings includes below parameters:

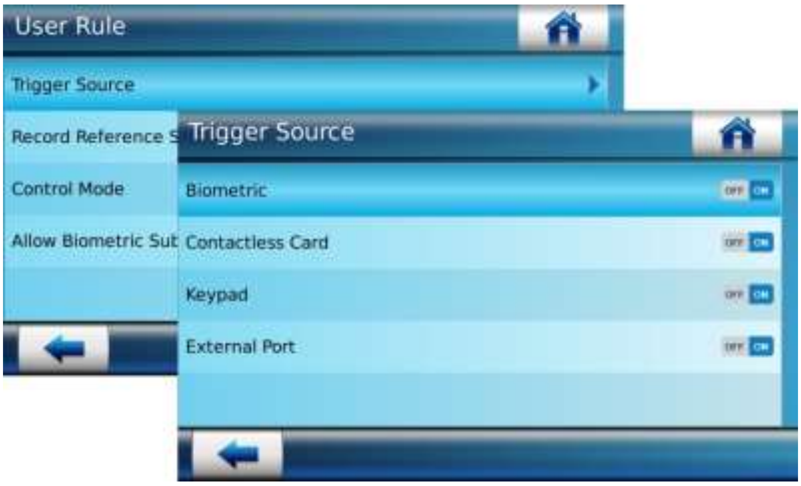


Figure 65: Defining User Rule – Trigger Source

36. **Trigger Source**: The administrator can configure which of the following triggers the terminal for the access.
    a. Set **Biometric** as ON, if the administrator wants to allow user to access by fingerprint identification. If trigger event through biometric is OFF, then user cannot initiate the access rights check using fingerprint. And Biometric Check will be bypass for the particular user.
    b. Set **Contactless Card** as ON, if the administrator wants to allow the user to request access by presenting card authentication
    c. Set **Keypad** as ON, if the administrator wants to allow the user to request access by entering User ID and PIN using keypad. The authentication is done by matching provided PIN with the stored data of the same user.
    d. Set **External Port** as ON, if the administrator wants to allow the user to request access by providing his User ID through External port

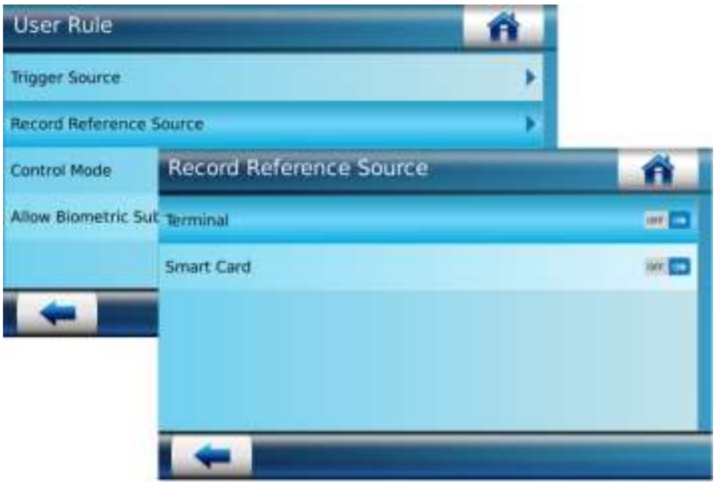


Figure 66: Defining User Rule – Record Reference Source

37. The administrator can configure whether user's information should be looked up in the Terminal database and/or on the Smart Card using **Record Reference Source**
    a. Select **Terminal** as ON, if it is required for the terminal to look up the user's profile in database
    b. Select **Smart Card** as ON, if it is required for the terminal to look up the user's profile in smart card

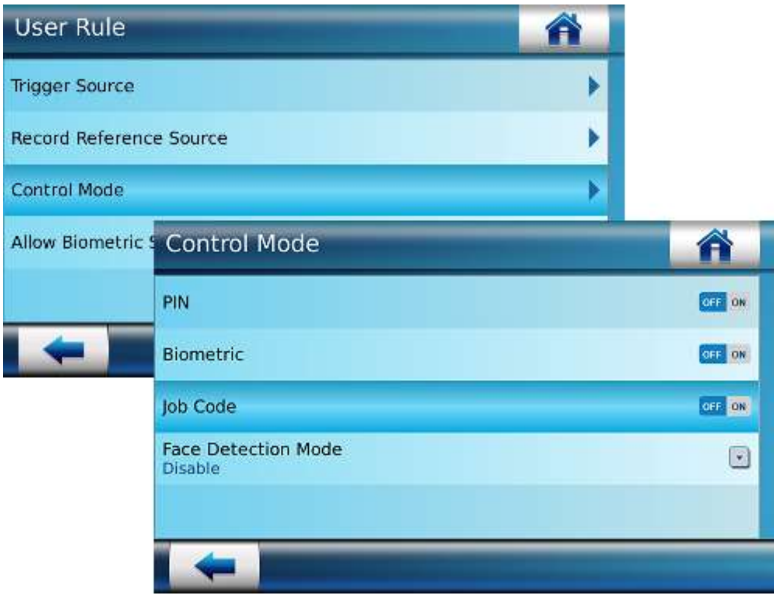
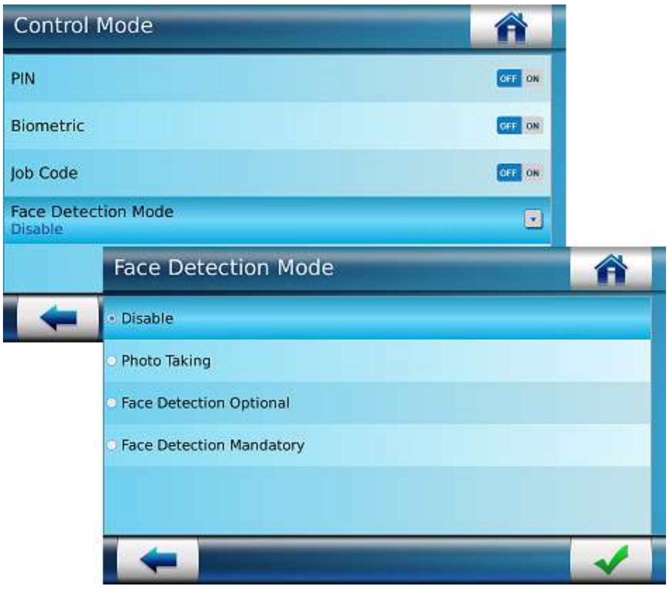


Figure 67: Defining User Rule – Control Mode

38. The administrator can set the following parameters under Control Mode
    a. **PIN** mode as ON, if PIN based authentication is required
    b. **Biometric** as ON, if Biometric authentication is required
    c. **Job Code** as ON, if job code based authentication is required



Control Mode

PIN OFF ON

Biometric OFF ON

Job Code OFF ON

Face Detection Mode
Disable

Face Detection Mode

● Disable

○ Photo Taking

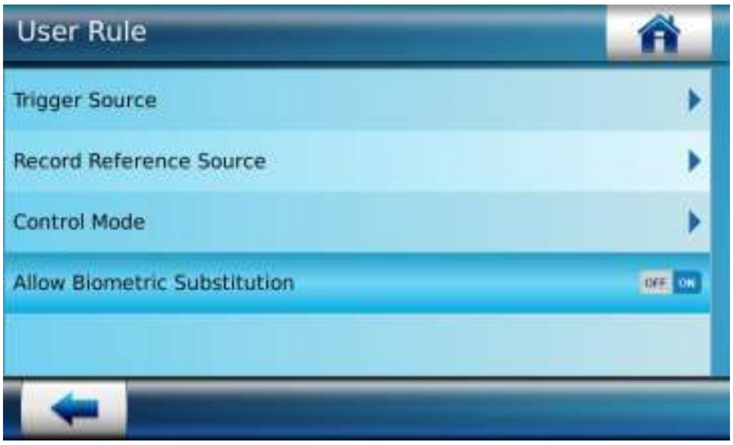
○ Face Detection Optional

○ Face Detection Mandatory

Figure 68: Defining Control Mode - Face Detection Mode

d. **Face Detection Mode:** (SIGMA Families only) The administrator can configure face authentication check rule as depicted in the snapshot above. Please refer to “*Additional User Control Settings”* to understand Face Detection workflow.

39. The administrator can set **Allow Bio Substitution** parameter as ON. It indicates that instead of Biometric, the user can be authenticated through a substitute such as BIO-PIN



User Rule

Trigger Source

Record Reference Source

Control Mode

Allow Biometric Substitution OFF ON

Figure 69: Defining User Rule – Biometric Substitution

40. Press on “✓” to **Save** user information

Results

A confirmation message is displayed showing User is enrolled successfully. The user information is stored in the database.

Whenever user tries to access by providing fingerprint, terminal will match the fingerprint with the records stored in the database and allow access on successful identification.

Recommendation: In case of authentication failure due to bad biometrics, the administrator can re-enroll the user.

User Enrolment in Card

The administrator can encode a contactless smartcard for a user, using this functionality. The user's data are saved only on the card, and not in the terminal database. It means, that the authentication of the user is done by checking the user's data stored in the card. For example, when user place finger on biometric sensor, the terminal will check the biometric provided by the user with the biometric stored in the users card.

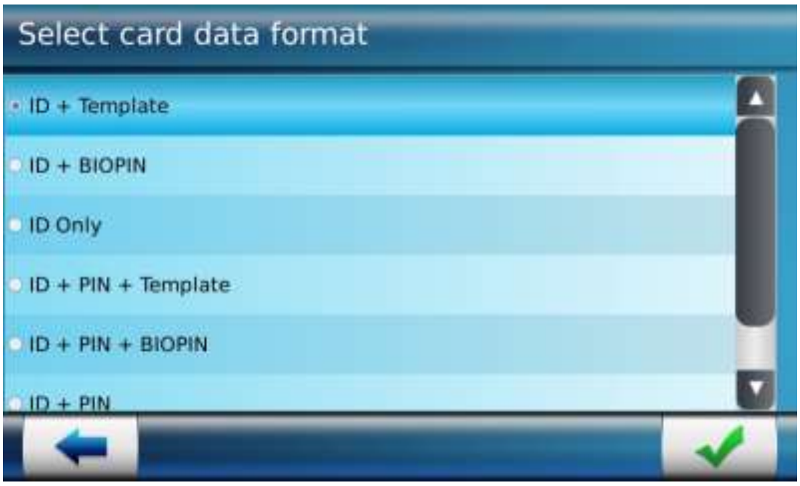
Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Add/Enroll User > Card Only	✓	✗
Webserver	User Management > User Enrollment > Enrollment Mode > Card Only	✓	✓

Pre-requisites

- Only an Administrator with 'Full Admin Rights' or 'Database Admin Rights' or 'Limited Database Admin Rights' can enroll new users
- User name and first name stored in cards are limited to 20 characters. By consequence even if user name and first name until 40 characters are authorized for local enrolment, encoding card will be not possible if they are longer than 20 characters.

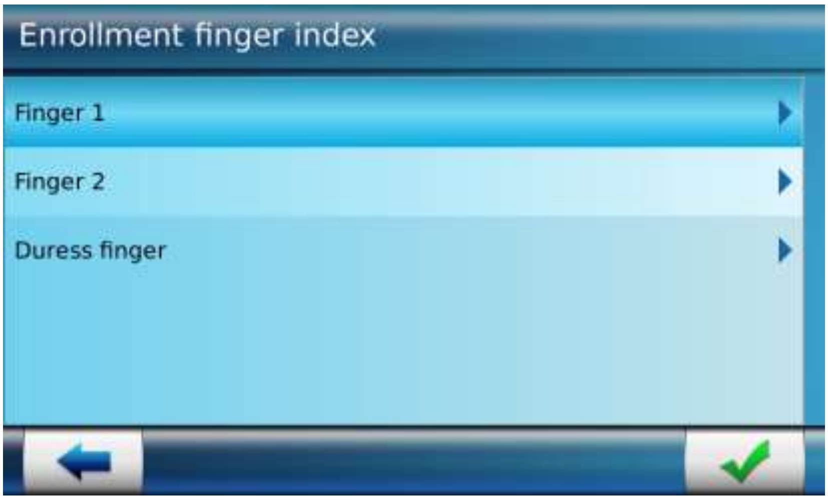
Screens & Steps



Select card data format

Figure 70: Select Card Data Format

1. The administrator can use the Card Data Format to select the data that will be used for user authentication. Following are the options available:
   a. **ID + Template:** When the administrator selects this format, it implies that the user authentication is done by verifying the User ID and biometric template (i.e. fingerprint registered by user) Three biometric templates can be stored for a user including two mandatory biometric templates (fingerprints) and one duress finger



Enrollment finger index

Finger 1

Finger 2

Duress finger

Figure 71: Enrollment Finger Index in Card

   b. **ID + BIOPIN:** When the administrator selects this format, it implies that the user authentication is done by verifying the User ID and BIOPIN (i.e. PIN that is used in place of biometric data)
   c. **ID Only:** When the administrator selects this format, it implies that the user authentication is done by verifying the User ID
   d. **ID + PIN + Template:** When the administrator selects this format, it implies that the user authentication is done by verifying the User ID, PIN, and Biometric Template
   e. **ID + PIN + BIOPIN:** When the administrator selects this format, it implies that the user authentication is done by verifying the User ID, PIN, and BIOPIN
   f. **ID + PIN:** When the administrator selects this format, it implies that the user authentication is done by verifying the User ID, and PIN
2. According to the selected Card Data Format, next user's data will be captured and stored in the card. The below screens are for ID + Template format
3. Please refer steps 1 to 11 of section "*User Enrolment in Database*"

4. A message to place card at terminal is displayed.
5. **Place Smart Card** on the card reader. You may have to place card for 1 to 10 seconds, till the success message is displayed showing the user's data is stored in the card

Results

The user is enrolled successfully and user's data is stored in the Card. The user can initiate access request by placing a card at terminal. The terminal will read User ID and ask user to enter required data, i.e. biometric/pin/biopin.

Note: The user’s data stored on card are not editable or viewable.

User Enrolment in Card & Database

An administrator can use this functionality to enroll a new user and store the user data in a contactless smartcard as well as in the database of the terminal. This implies that the authentication of the user is done by checking the details stored in the card as well as in terminal database. For example, when user places finger on biometric sensor, the terminal will check the biometric provided by the user matches with the biometric stored in the users card.

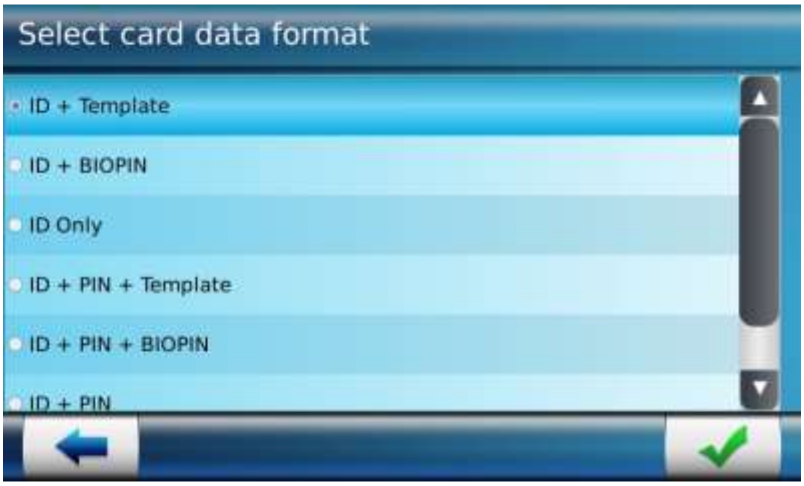
Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Add/Enroll User > Card + DB	✓	✗
Webserver	User Management > User Enrollment > Enrollment Mode > Db+Card	✓	✓

Pre-requisites

- Only an Administrator with 'Full Admin Rights' or 'Database Admin Rights' or 'Limited Database Admin Rights' can enroll new users

Screens & Steps



Select card data format

- ● ID + Template
- ○ ID + BIOPIN
- ○ ID Only
- ○ ID + PIN + Template
- ○ ID + PIN + BIOPIN
- ○ ID + PIN

Figure 72: Select Card Data Format

1. The administrator can select the user data that is required for access rights check, by means of Card Data Format. The administrator must select the appropriate user data type and then encode the user's card accordingly.
2. Please refer to "*User Enrolment in Database*" section step # 1 to 40
3. Wait for the message to place card at terminal, to get displayed. **Place Smart Card** now
4. On placing card, the user's data is stored in the card

Results

The user is enrolled successfully and user's data are stored in the terminal database as well as in the smartcard. The user can initiate access request by placing the card on the terminal. The terminal will read User ID and ask user to enter required data, i.e., biometric, pin or biopin. The authentication of the user is done based on **Record Reference Source** selected in User Rule.

Note: The user's data stored on card are not editable or viewable.

Recommendation: If the user authentication has failed due to bad biometric, the administrator can re-enroll the user.

Update User Information

The administrator can edit user information stored in database, by using this functionality. The administrator cannot update the user information if the user has been enrolled only in the card. However it is possible to erase and rewrite the user's card with new data.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Edit User	✓	✗
Webserver	User Management > Users	✓	✓

Screens & Steps

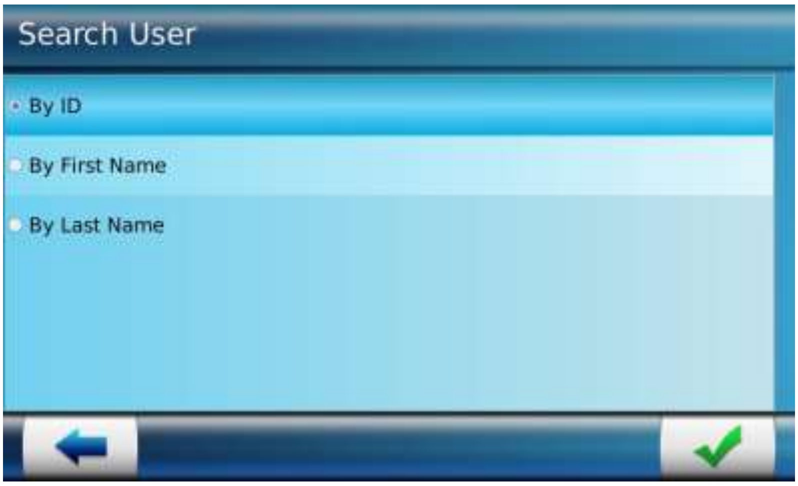


Figure 73: Selecting Search Criteria

1. Select Search User by **ID**, **First Name** or **Last Name**
2. Press on "✓" button to move on next screen

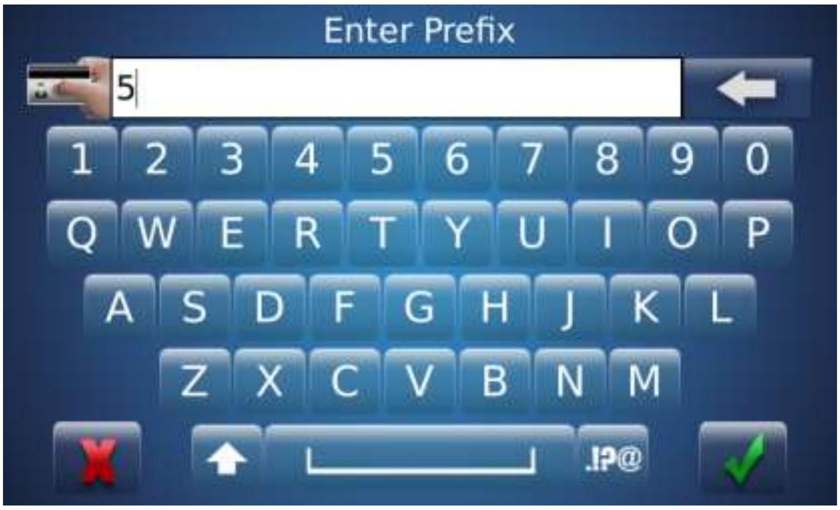


Figure 74: Entering first digits of the searched User ID

3. Enter the **User ID** of the user account which is required to be edited
4. Press on "✓" button to move to next screen

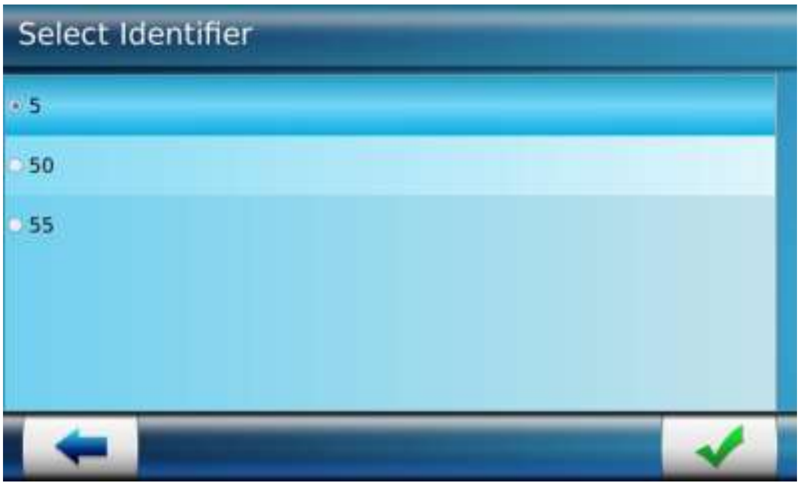
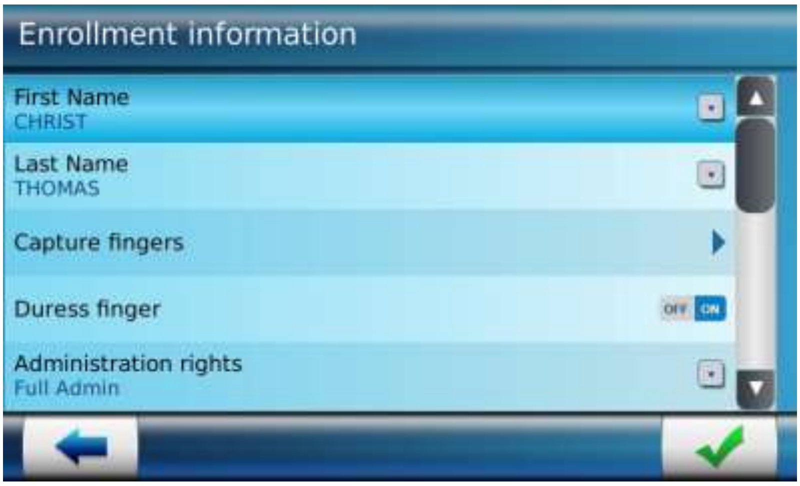


Figure 75: Selecting User ID

5. The list of User IDs matching with the entered id will be displayed. **Select User ID** from the list and Press on "✓" to proceed.



Enrollment information

First Name
CHRIST

Last Name
THOMAS

Capture fingers

Duress finger OFF ON

Administration rights
Full Admin

Figure 76: Enrolment Information screen is displayed for editing

6. Only an Administrator with 'Full Admin Rights' or 'Database Admin Rights' can update the following user details, by means of the Enrolment Information screen as depicted in the above snapshot.
    a. First Name and Last Name of the user
    b. Capture Fingerprints
    c. Update Admin Rights (Only Administrator with 'Full Admin Rights' can update)
    d. Update User Pin
    e. Assign Job Code
    f. Configure Access Schedule
    g. Set Observe Holiday Schedule
    h. Set Door Open Timeout
    i. Add Expiry Date
    j. Configure Authorized list
    k. Configure VIP User
    l. Configure User Rules
7. Press on "✓" to **Save** user information

Results

The user information is updated and stored in database. When user tries to access, the updated information is used for verification.

Authenticate User

Only an Administrator with 'Full Admin Rights' or 'Database Admin Rights' can authenticate user by using this functionality. This feature can be used by the administrator to test whether the enrolled user is allowed access or not.

However the user can authenticate from the home screen, by entering in User ID and then placing finger when asked.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Authenticate User	✓	✗

Screens & Steps

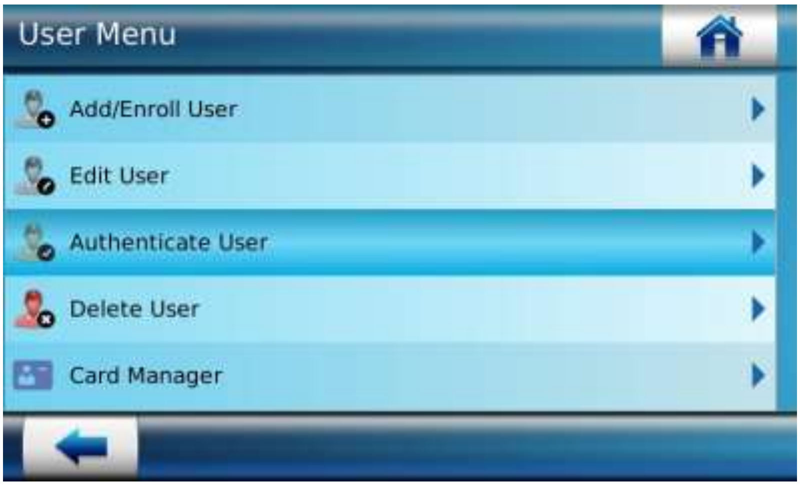
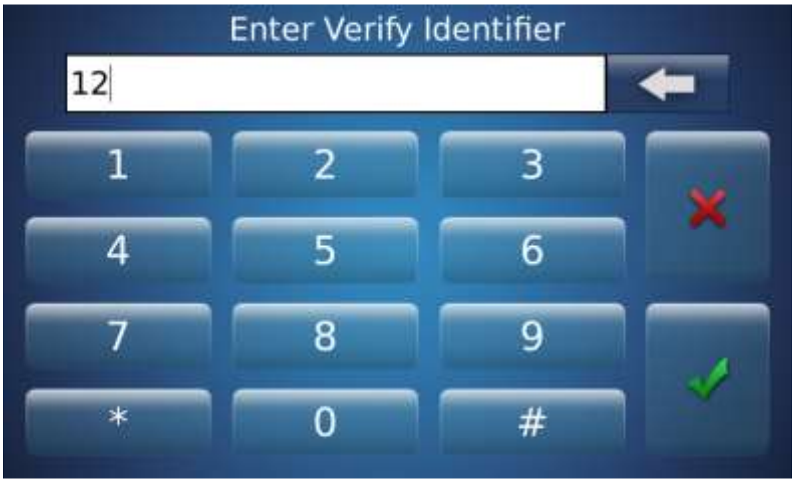


Figure 77: Authenticate User



Enter Verify Identifier

12

Figure 78: Entering User ID for authentication

1. Enter the **User ID** that is required to be authenticated and Press on "✓" button
2. Terminal will ask user to place finger on biometric sensor

Results

A success message is displayed and user will be granted access on successful authentication. In case authentication is not successful access is denied.

Delete User

Only an Administrator with 'Full Admin Rights' or 'Database Admin Rights' can delete user information by using this functionality. There are several options for deleting users:

- Delete a User
- Delete All Users

Delete a User

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series

Terminal Menu	User Menu > Delete User > Delete User	✓	✗
Webserver	User Management > Users	✓	✓

Screens & Steps

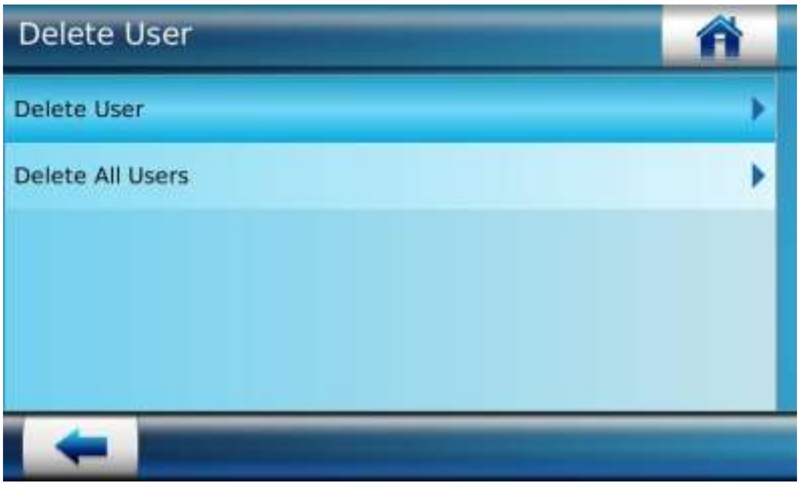


Figure 79: Deleting User

1. If the administrator needs to delete a single user, Select **Delete User**.

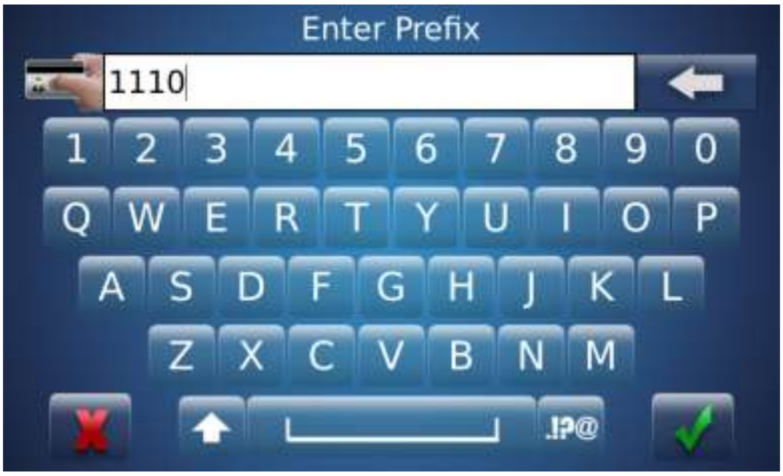
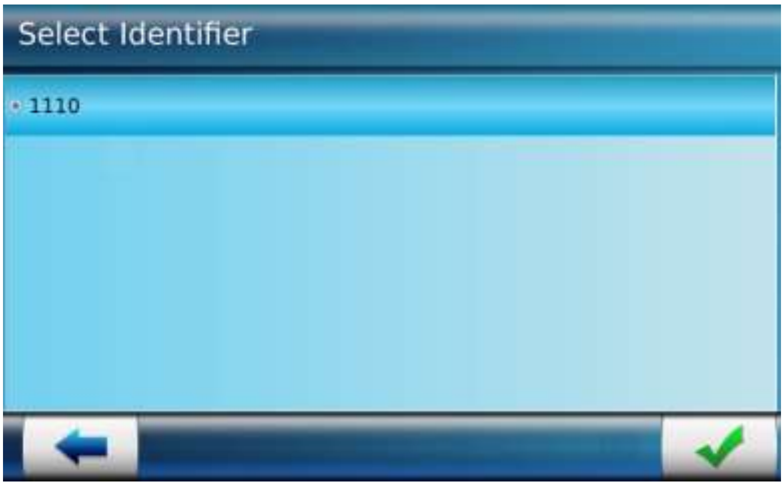


Figure 80: Searching User ID

2. The administrator needs to enter the **User ID** that needs to be deleted.

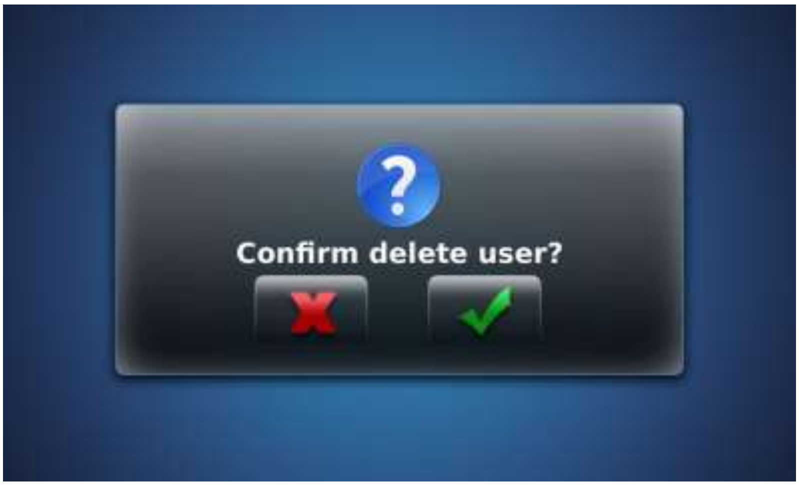


Select Identifier

- 1110

Figure 81: Deleting User ID

3. The list of User IDs matching entered User ID is displayed. Select a User ID
4. Press on "✓" button to move to next screen



Confirm delete user?

Figure 82: A confirmation message pop up for delete

5. A confirmation message is displayed, asking to confirm the action
6. Press on check "✓" to confirm delete action

Results

The User ID is deleted successfully. The terminal will deny access to the deleted user.

Delete All User ID

The administrator can use this functionality to delete all the users stored in terminal database.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Delete User > Delete All User	✓	✗
Webserver	User Management > Users	✓	✓

Screens & Steps

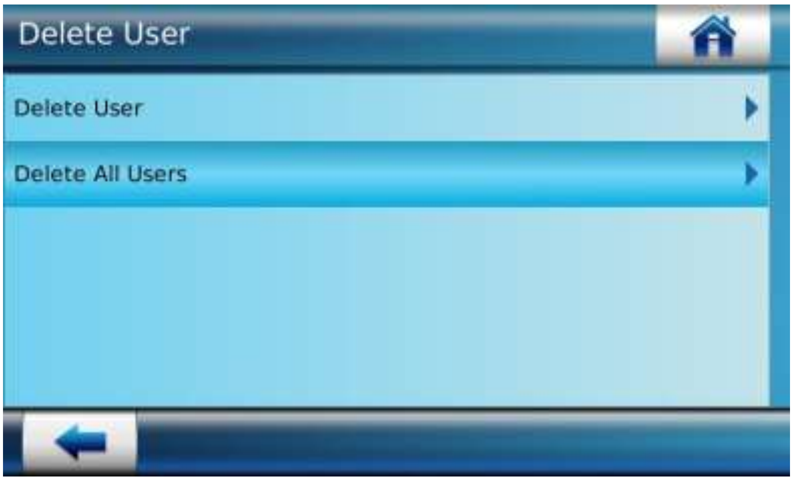
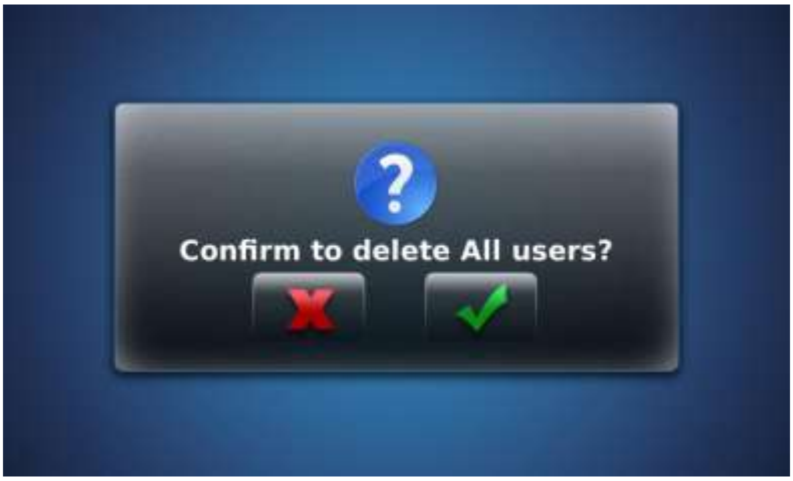


Figure 83: Select Delete action

1. The administrator needs to Select **Delete All Users** to delete all the users in the database



Confirm to delete All users?

Figure 84: Confirm All User Deletion

2. A confirmation message is displayed, asking the administrator to confirm the action
3. Press on check "✓" to confirm delete all users action
4. A success message is displayed showing all users are deleted

Card Manager

MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminals allows user enrolment and authentication using contactless smart cards. When the administrator enrolls a user on a smart card, the User Identifier, Fingerprint Template and PIN/BIOPIN are stored in the card. The terminal will now refer to the information on the card for user authentication if configured to do so.

The administrator can configure the contactless smart card parameters that are supported by MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals, by means of the Card Manager Menu.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager	✓	✗
Webserver	Control Configuration > Contactless Card	✓	✓

The subsequent sections are pertaining to MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals.

Screens & Steps

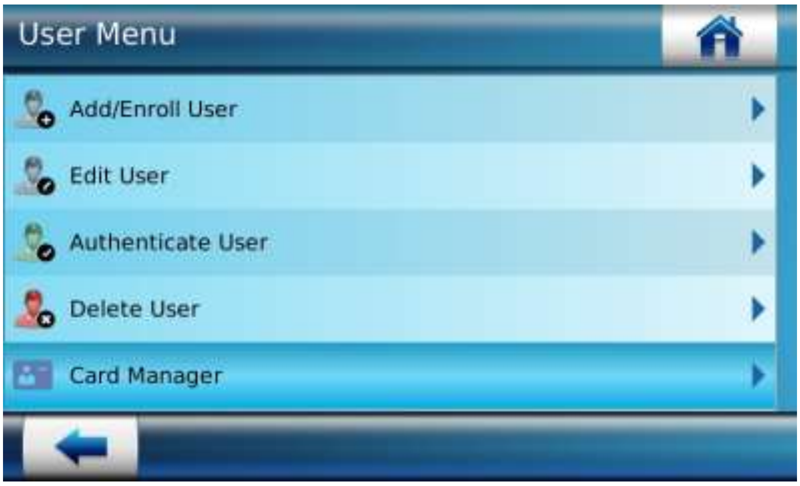


Figure 85: Accessing Card Manager

For correct operation, the administrator needs to configure certain parameters in the Card Manager tab. These parameters are explained in the subsequent section.

Renewal of User Card

A smart card may have an expiry date. Once the smart card has expired it is not useful for verification. The administrator can renew a contactless card that has expired with the same user data such as User ID, fingerprint, PIN and BIOPIN that is saved in it. This can be done using the Renewal of User Card functionality. By renewing user card, the expiry of the card is reset and card can be used for verification.

This feature is also useful when a user loses his card. In that case, it is recommended to add the lost card to the Banned list, in order to avoid fraudulent use of the lost card.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Renewal User Card	✓	✗
Webserver	User Management > Users	✓	✓

Pre-requisites

- User data stored must be available in terminal database, the same data is written on the card on renewal
- Card is secured with the same key as on terminal
- To store fingerprint, user data should contain at least two finger templates, not only one

Screens & Steps

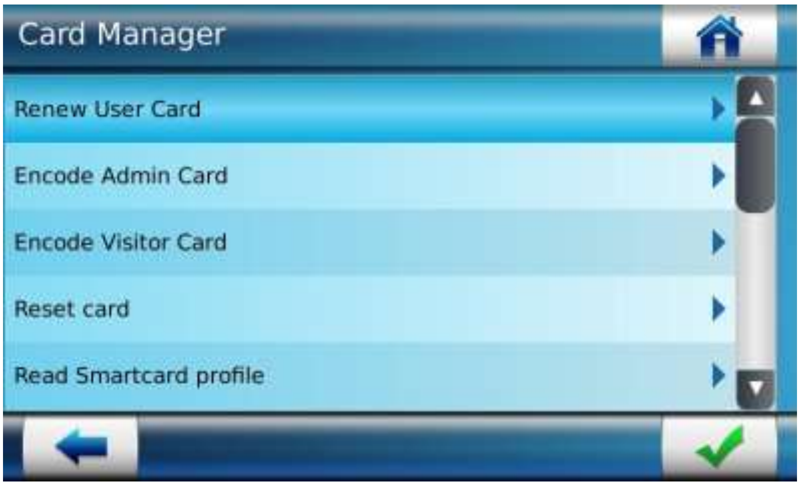


Figure 86: Renewal of User Card

1. Select **Renew User Card**

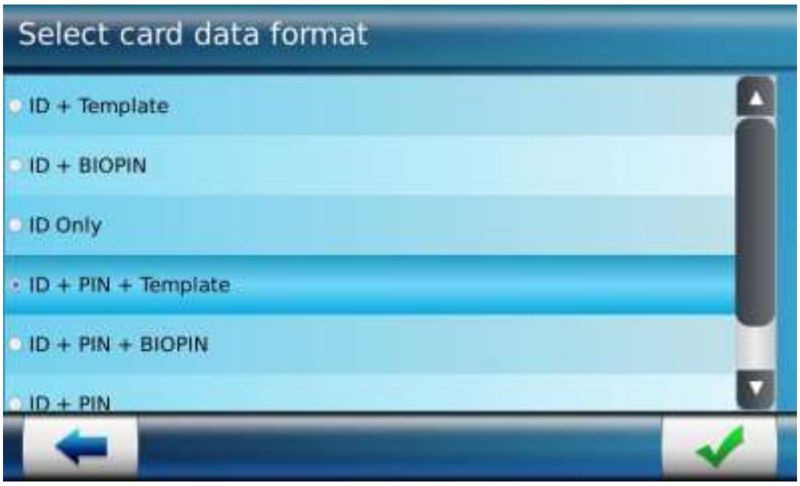


Figure 87: Select Card Data Format

2. Select the card data format from available options as below:
   a. ID + Template (fingerprint)
   b. ID + BIOPIN
   c. ID Only
   d. ID + PIN + Template
   e. ID + PIN + BIOPIN
   f. ID + PIN
3. Press on check box to move next

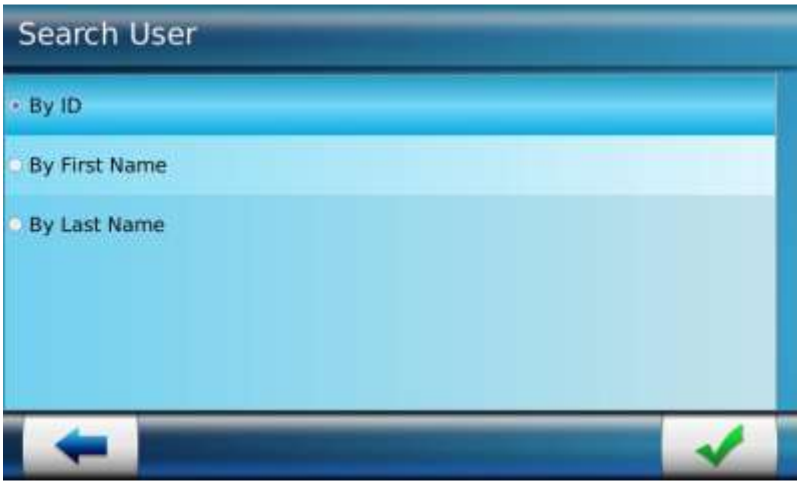


Figure 88: Select search criteria

4. Select criteria to search user by ID, First Name or Last Name
5. Press on check button to move next

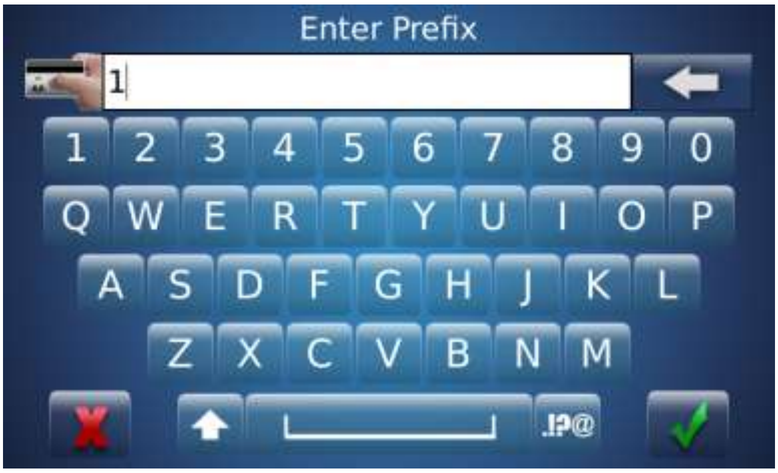
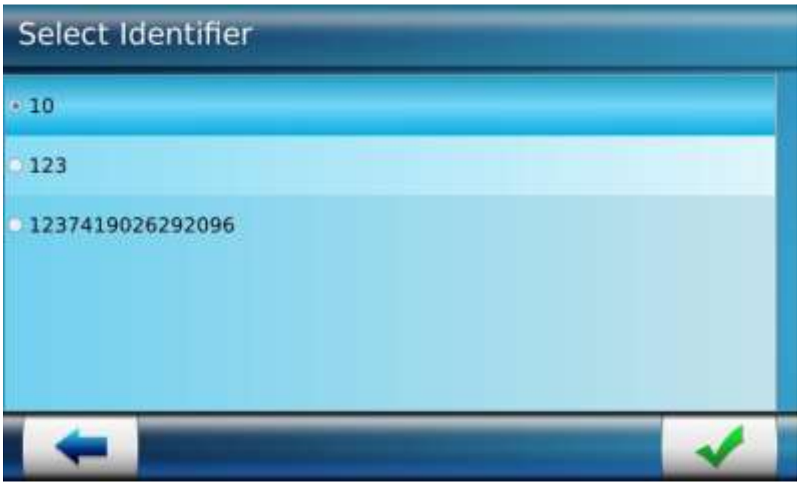


Figure 89: Entering User ID to be searched

6. Enter the first characters of the selected search criteria. E.g. if search by User ID is selected, then enter User ID Prefix

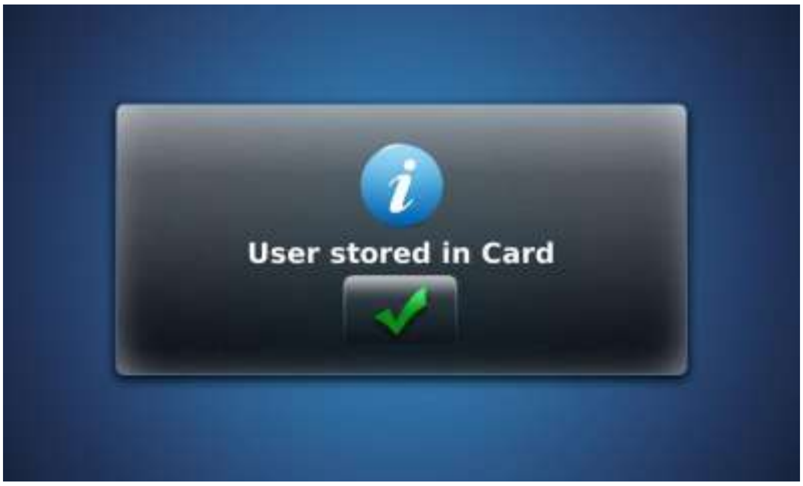


Select Identifier

- 10
- 123
- 1237419026292096

Figure 90: Selecting User ID

7. The list of User IDs matching the first characters entered in search criteria are displayed. The administrator will now have to select a **User ID** that needs to be written to the card.
8. Press on "✓" to move ahead
9. Terminal will ask for placing the card on card reader. **Place card**



User stored in Card

Figure 91: A success message is displayed showing user is stored in card

Results

User's data stored in terminal database are copied on the card. The card is renewed with new expiry date. Now user can use this card for authentication.

Encode Administrator card

When site key in a terminal is changed, it is required to load the same site key in all the terminals in a premises. In such scenario, an Administrator card can be used to change the site key in other terminals.

The administrator can use the Encode Administrator card feature to store contactless site key in the card. This can be copied to other terminals by using the administrator card.

NOTE:

- The administrator can change site key using Administrator card provided the terminal supports the same card type. For example, using MIFARE® Administrator card an administrator can change site key of the terminal that supports MIFARE® card.
- If you are using administration DESFire card to change site key (with begin/start validity date equal to day you used the administration card on the terminal), you could not change them again using distant command.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Encode Administrator card	✓	✗

Pre-requisites

- Card is encoded with terminal’s key only, no user data is stored on administrator card
- Default start block number is used for reading Administrator card

Screens & Steps

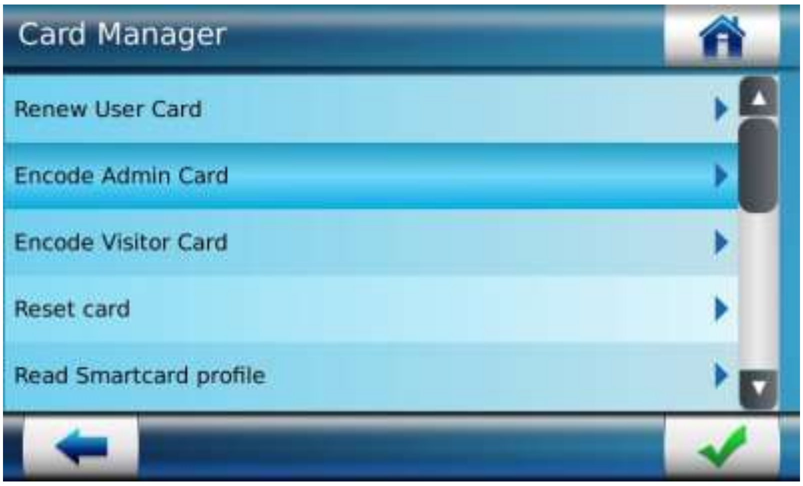


Figure 92: Encoding Administrator card

1. Select **Encode Administrator card**

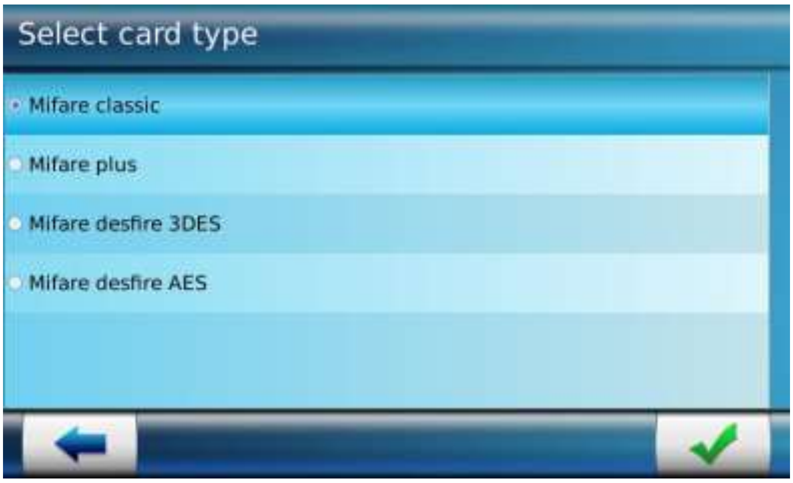


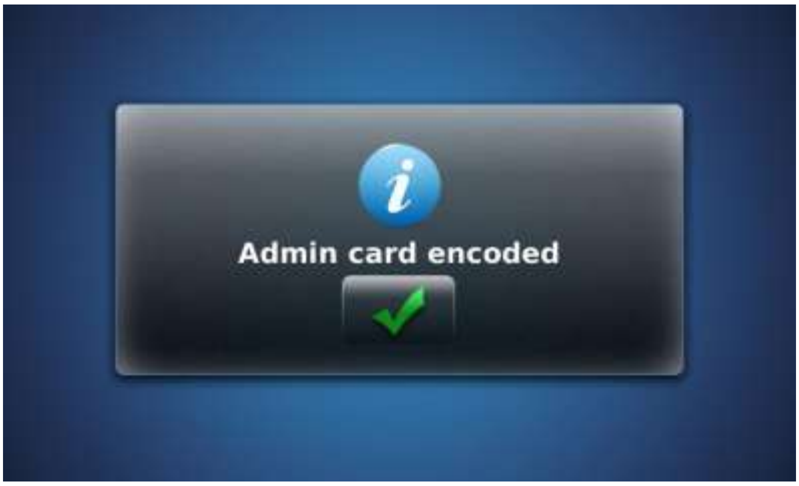
Figure 93: Select Card Type to be encoded

2. Select the **Card Type**, for which site key is to be generated. Options are MIFARE® Classic, MIFARE® Plus, DESFire® 3DES, and DESFire® AES

NOTE:

- The administrator must be careful while encoding MIFARE® 1K Cards. If the number of start block is set as 20 or more, then an error message, i.e., 'Error in Encoding Administrator card' is displayed. Refer to “No. of Start Block for MIFARE® Cards”, to know how to configure the number of start block.

3. Press on “✓” button to save and next
4. The Terminal will ask user to **Place Card** on card reader. Present the selected card type on card reader



Admin card encoded

Figure 94: Administrator card is encoded

Results

A success message is displayed showing that the administrator card is encoded. The site key in the terminal is copied in the administrator card. The administrator can change the site key of other terminals using same administrator card.

Encode Visitor Card

Encoding means writing user data, which includes Name, Biometric data, PIN or BIOPIN; on contactless smart cards. Cards for normal users as well as visitors can be encoded.

The administrator can encode a contactless card for a visitor by means of this functionality. Basically such a card is for a guest user who needs to enter the premises temporarily. For a visitor card, the Terminal does not require information such as Name, Biometric data, PIN or BIOPIN. On presenting visitor card, terminal will authenticate the visitor card, read User ID and allow access.

Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Encode Visitor Card	✓	✗

Pre-requisites

- Card data Format for Visitor Card is set to ID only

Screens & Steps

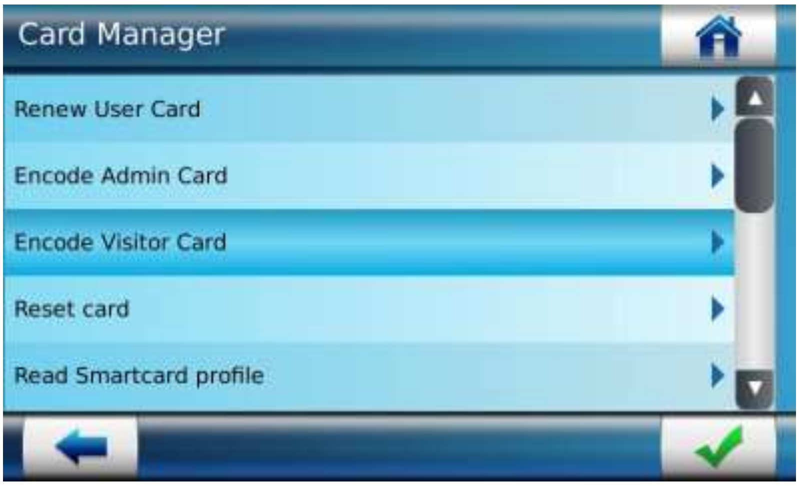


Figure 95: Encoding Visitor Card

1. Select **Encode Visitor Card**

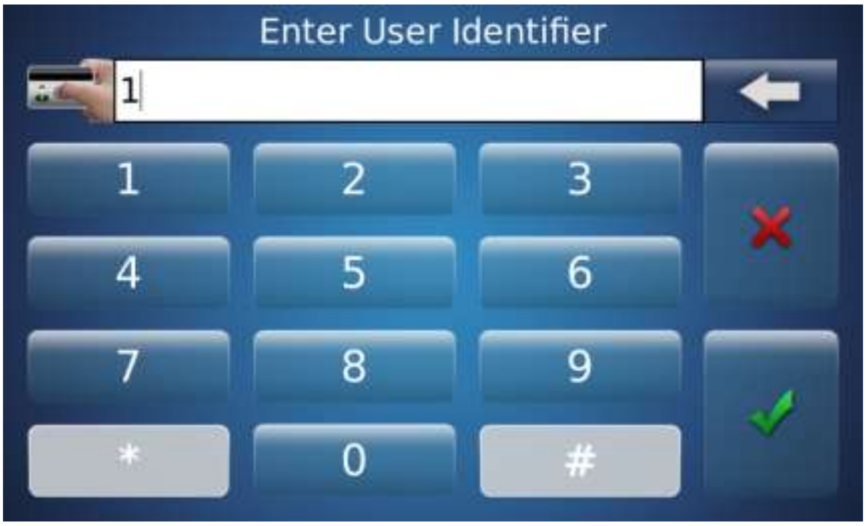


Figure 96: User ID for Visitor Card

2. Terminal will prompt to enter **User ID**.

   NOTE: Contactless card CSN can also be used as User ID by configuring a specific parameter. For more details, please refer to “Smart Card” section in **MorphoAccess® 5G Series – Parameters Guide**.

3. Press on “✓” button to save and next
4. Terminal will ask user to present card on card reader. **Present Card** on card reader
5. A success message is displayed showing visitor card is encoded successfully

Smart Card Read Profile

The administrator can set the type of card that MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal will be able to read, by means of this functionality. This implies that these cards can be used for authentication purpose only. The data on the card cannot be changed.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Smart Card Read Profile	✓	✗
Webserver	Control Configuration > Contactless Card > General Parameters > Read Profile	✓	✓

Screens & Steps

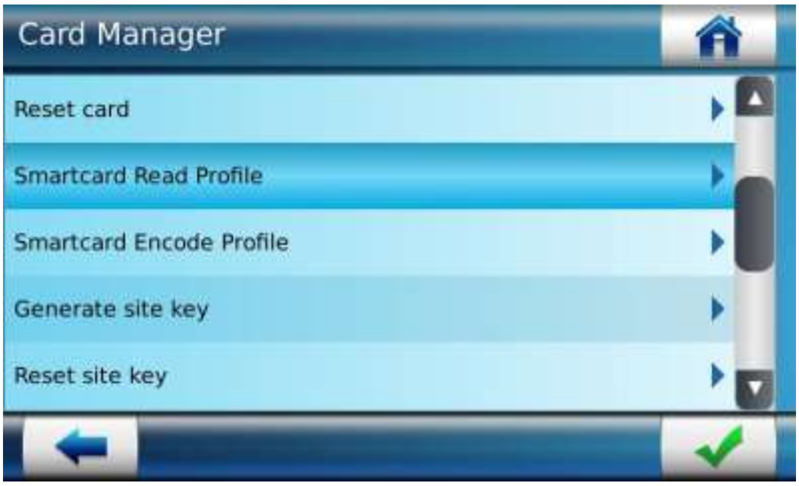
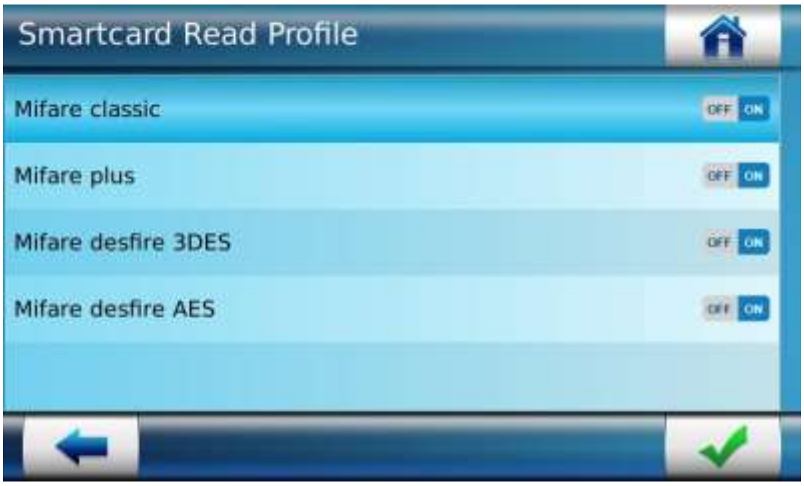


Figure 97: Smartcard Read Profile

1. Select **Smartcard Read Profile**
   a. *In case of Multi product.*


Smartcard Read Profile

Mifare classic OFF [✓ ON]

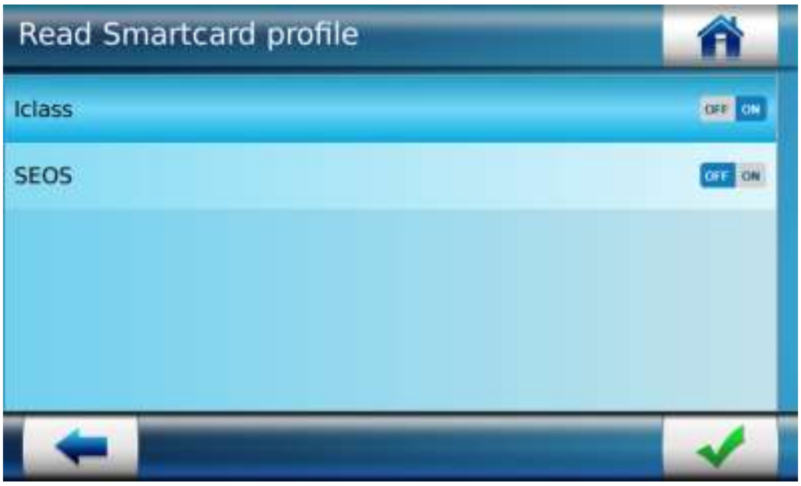
Mifare plus OFF [✓ ON]

Mifare desfire 3DES OFF [✓ ON]

Mifare desfire AES OFF [✓ ON]

Figure 98: Smartcard Read Profile_Multi

b. *In case of iClass product.*


Read Smartcard profile

Iclass OFF [✓ ON]

SEOS [✓ OFF] ON

Figure 99: Smartcard Read Profile_iClass

2. The administrator must set the following card read profile as ON, if it is required to be readable by the terminal.

➔ <u>In case of Multi Product</u>

a. MIFARE® Classic
b. MIFARE® Plus
c. MIFARE® DESFire® 3DES
d. MIFARE® DESFire® AES

➔ <u>In case of iClass Product</u>

a. IClass®
b. IClass®SE

3. Press on "✓" button to save configuration

Smart Card Encode Profile

The administrator can set the type of card that MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal will be able to encode, by using this functionality. These cards can be used to store user's profile and for user authentication. The administrator can update or reset the data on the card.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Smart Card Encode Profile	✓	✗
Webserver	Control Configuration > Contactless Card > General Parameters > Encode Profile	✓	✓

Screens & Steps

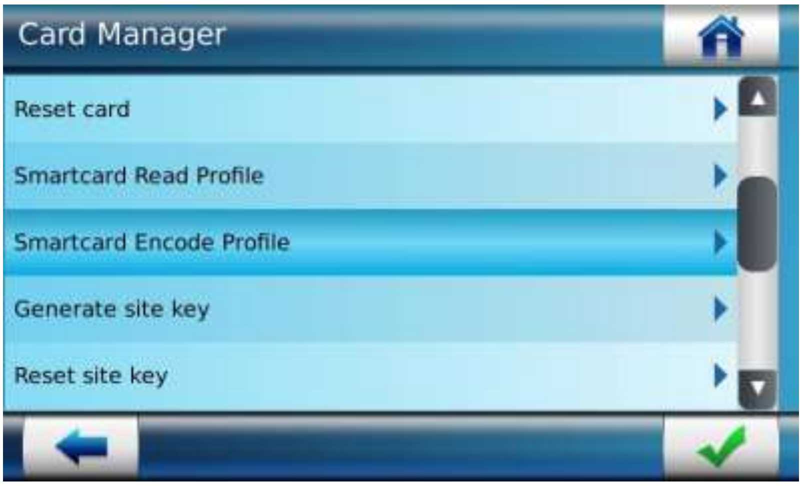
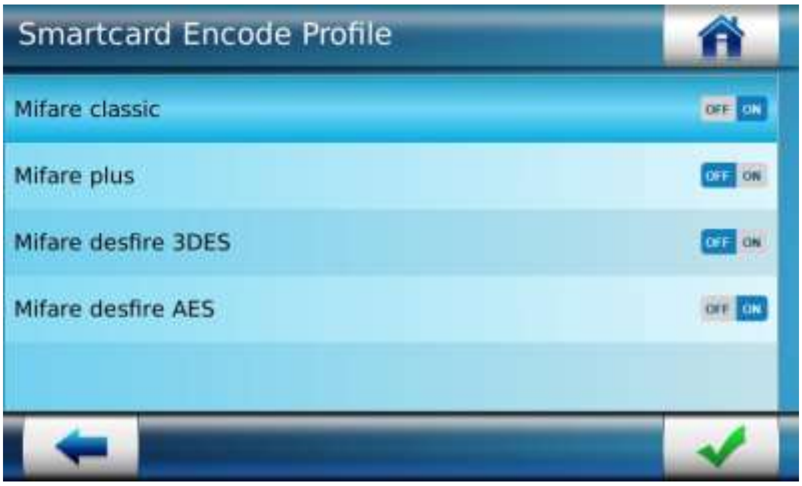


Figure 100: Smartcard Encode Profile

1. Select Smart card encode profile



Smartcard Encode Profile

Mifare classic OFF ON
Mifare plus OFF ON
Mifare desfire 3DES OFF ON
Mifare desfire AES OFF ON

Figure 101: Smartcard Encode Profile

2. The administrator needs to set the following smartcards encode profile as ON, if they are to be encoded by the terminal:
   a. MIFARE® Classic
   b. MIFARE® Plus
   c. MIFARE® DESFire® 3DES
   d. MIFARE® DESFire® AES

NOTE:

- It is not possible to encode several type of MIFARE (Classic) or DESFire (3DES and AES) cards at the same time.

3. Press on “✓” button to save configuration

Generate Site Key

Securing card includes protecting the card by primary/secondary keys to prevent unauthorized use. At the time of authentication using a smart card, the site key stored in card and the one in the terminal must match. There is a default site key which is present in the terminal as well as on the smart card. The administrator can generate a new site key in the terminal for all card types and upload the same key in the card by using Generate Site Key functionality.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Generate Site Key	✓	✗

Screens & Steps

1. Select **Generate Site Key**

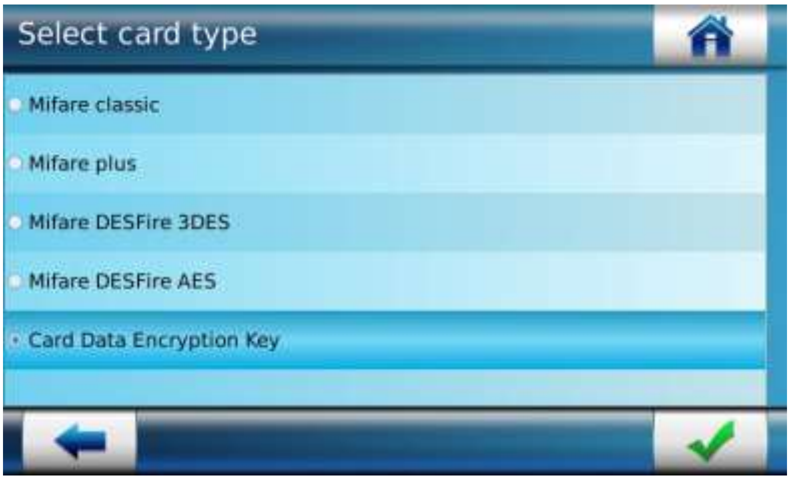
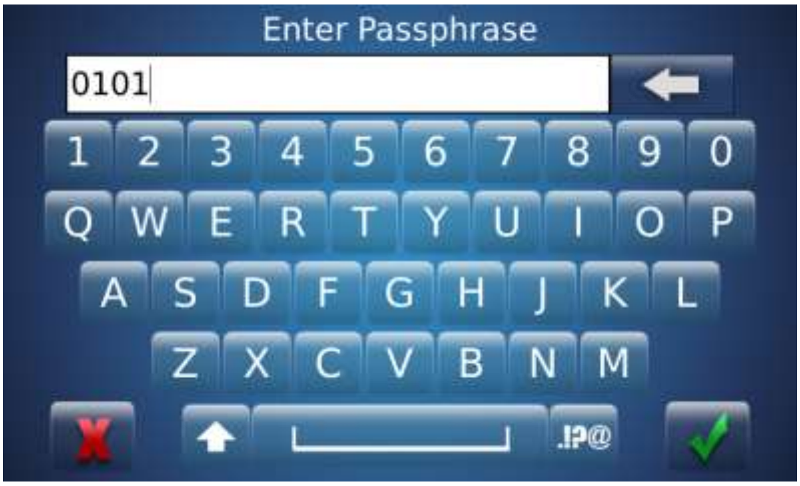


Figure 102: Selecting Key Type

2. Select the Key Type, for which site key is to be generated.
3. Press on "✓" button to save. Move to the next screen.

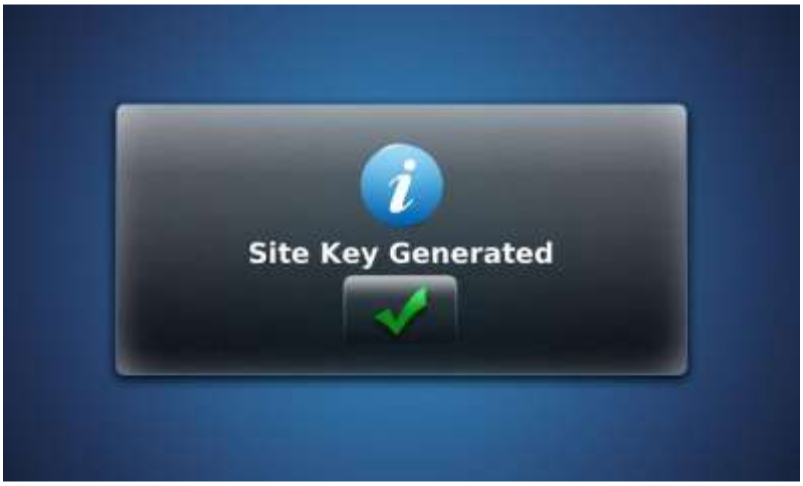


Enter Passphrase

0101

Figure 103: Generating Site Key

4. Enter the Passphrase to generate Site key using keyboard.
5. Use check button to save



Site Key Generated

Figure 104: Success message is displayed showing site key is generated in the terminal

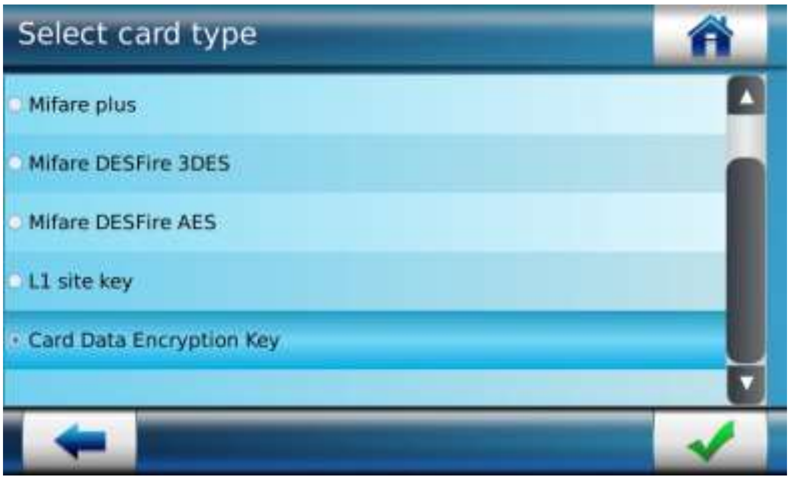
Reset Site Key

The administrator can reset security keys stored in terminal to factory default settings by using this functionality. The administrator can select the card type from the available card types.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Reset Site Key	✓	✕

Screens & Steps



Select card type

- Mifare plus
- Mifare DESFire 3DES
- Mifare DESFire AES
- L1 site key
- Card Data Encryption Key

Figure 105: Resetting keys

1. Select key type to be reset
2. Use "✓" to save settings

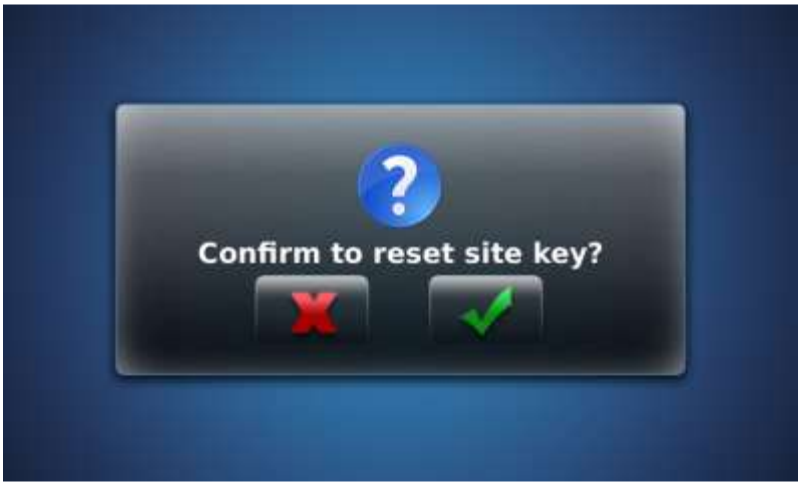

Confirm to reset site key?

Figure 106: Confirming reset key action

3. Confirm reset site key by click on "✓"

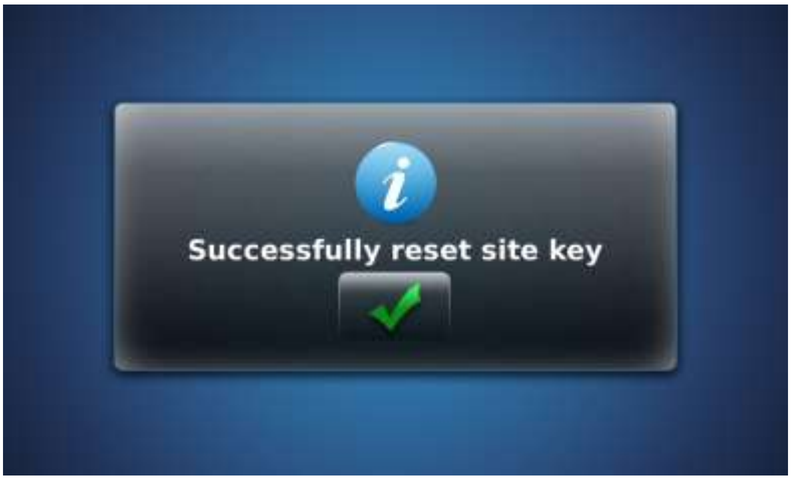

Successfully reset site key

Figure 107: Site Key is reset successfully

Activate Card Data Encryption

The administrator can enable Card Data Encryption. This configuration encrypts the smartcard data during the encoding operation and decrypts these encrypted data during the reading operation. The card data encryption depends on an encryption key generated by the administator.

By default, Card Data Encryption is disabled.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Activate Card data Encryption	✓	✗
Webserver	Control Configuration > Contactless Card > General Parameters > Activate Card data Encryption	✓	✓

Screens & Steps

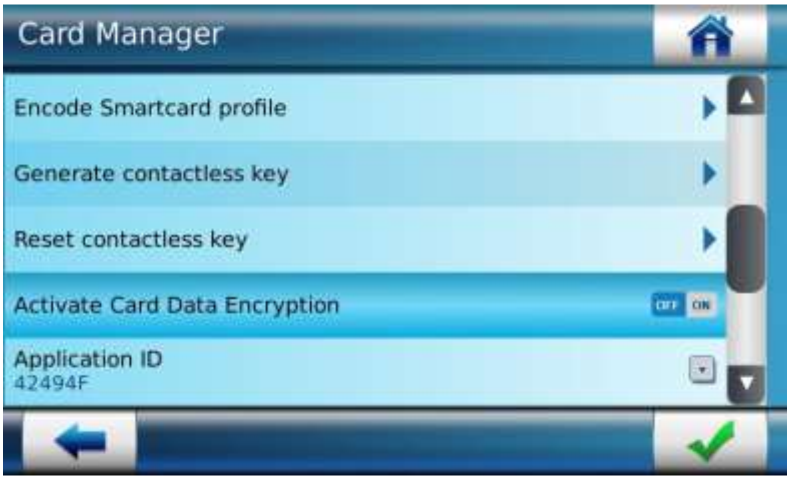


Figure 108: Activate Card Data Encryption

1. Login to Terminal and Navigate to User Menu >> Card Manager >> Activate Card Data Encryption
2. Enable the Activate Card Data Encryption Paramter
3. Use "✓" to save settings

Note :

The Card Data Encryption Key will be generated and stored in KMS as soon as “Activate Card Data Encryption” is ON and the administrator selects “Generate contactless key”.

The Card Data Encryption Key will be resetted to an hardcoded value and stored in KMS as soon as “Activate Card Data Encryption” is ON and the administrator selects “Reset contactless key”.

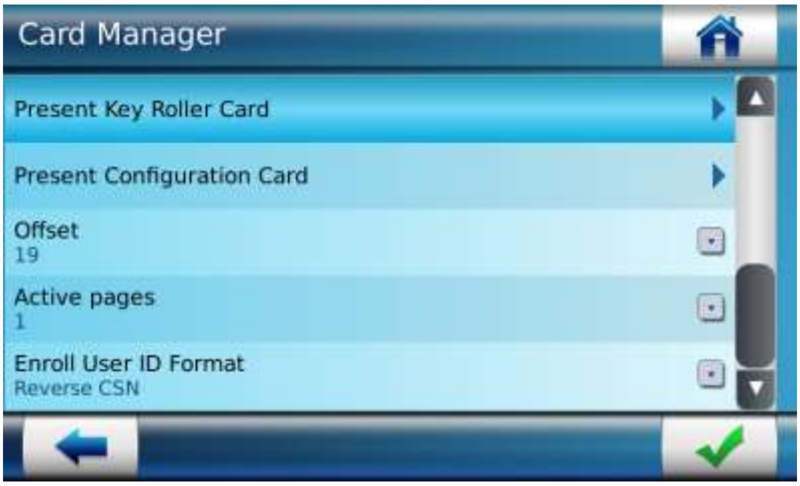
Configure ELITE Mode

The administrator can configure the iClass terminal in ELITE mode by using this functionality. The administrator can select the options to enable and/or disable the ELITE mode. When ELITE mode is enabled, the terminal will start accepting specific iCLASS card, ELITE card and starts rejecting the regular cards. There are two steps and two configuration card, to enable/disable this functionality as Key Roller Card & Configuration Card. This is applicable to only iClass terminal.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Present Key Roller Card ***OR*** User Menu > Card Manager > Present Configuration Card	✓	✗

Screens & Steps to Enable ELITE Mode



Offset
19

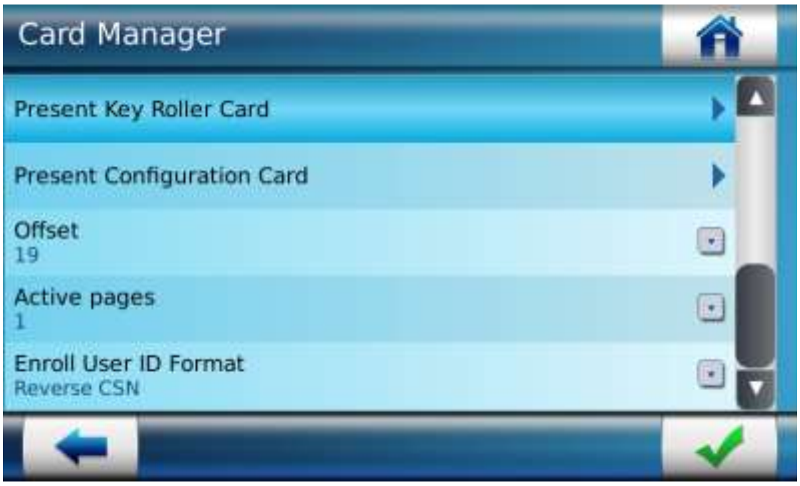
Active pages
1

Enroll User ID Format
Reverse CSN

Figure 109: Enable ELITE Mode

1. Select Present Key Roller Card
   a. Terminal will ask to Place Card.
   b. Present the “Key roller card STD->Elite” Card
   c. Check that terminal display Hold Card and then Remove Card
2. Select Present Configuration Card
   a. Terminal will ask to Place Card.
   b. Present the “Configuration card STD->Elite” Card
   c. Check that terminal display Hold Card and then Remove Card
3. Use “✓” to save settings
4. Now terminal will accept iCLASS Card encoded with ELITE Key and reject iCLASS – Standard Cards.

Screens & Steps to Disable ELITE Mode



Offset
19

Active pages
1

Enroll User ID Format
Reverse CSN

Figure 110: Disable ELITE Mode

1. Select Present Key Roller Card
    a. Terminal will ask to Place Card.
    b. Present the “Key roller card Elite->STD” Card
    c. Check that terminal display Hold Card and then Remove Card
2. Select Present Configuration Card
    a. Terminal will ask to Place Card.
    b. Present the “Configuration card Elite->STD” Card
    c. Check that terminal display Hold Card and then Remove Card
3. Use “✓” to save settings
4. Now terminal will accept iCLASS – Standard Cards and reject iCLASS Card encoded with ELITE Key.

No. of Start Block for MIFARE® Cards

The administrator can specify the location of the access control data on the contactless card, by configuring the number of the first block to read on the card. By default, the 1st block to read is block # 4.

NOTE 1:

The value specified for the start block applies also to the administrator cards, Hence the administrator needs to ensure that the administrator data is also stored from the same block number as user data on user cards.

NOTE 2:

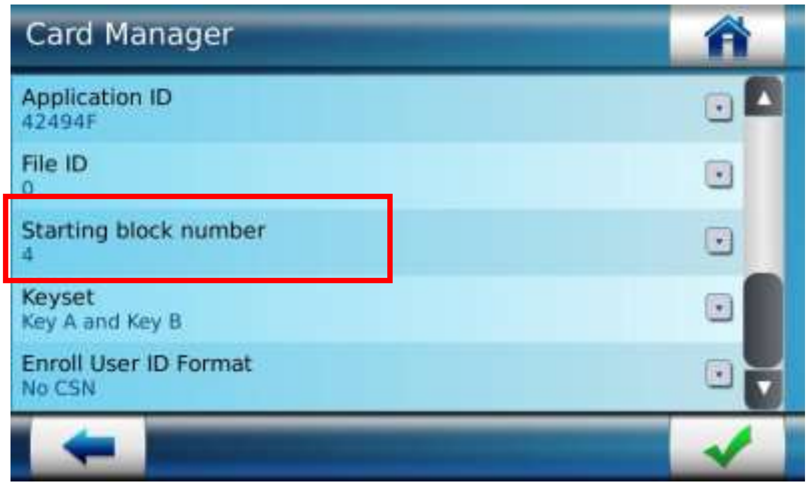
In case of 1 K MIFARE®, the administrator can set start block no. 4 to block 48.

In case of 4 K MIFARE®, the administrator can set start block no. 4 to block 216.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > No. Of Start Block	✓	✗
Webserver	Control Configuration > Contactless Card > TLV contactless card configurations > MIFARE Start Block	✓	✓

Screens & Steps



Application ID
42494F

File ID
0

Starting block number
4

Keyset
Key A and Key B

Enroll User ID Format
No CSN

Figure 111: Setting No. of Start Block

1. Select **Starting block number**
2. On next screen the administrator can enter the start block number using keypad
3. Use "✓" to save settings

Select Keyset for Reading MIFARE® Cards

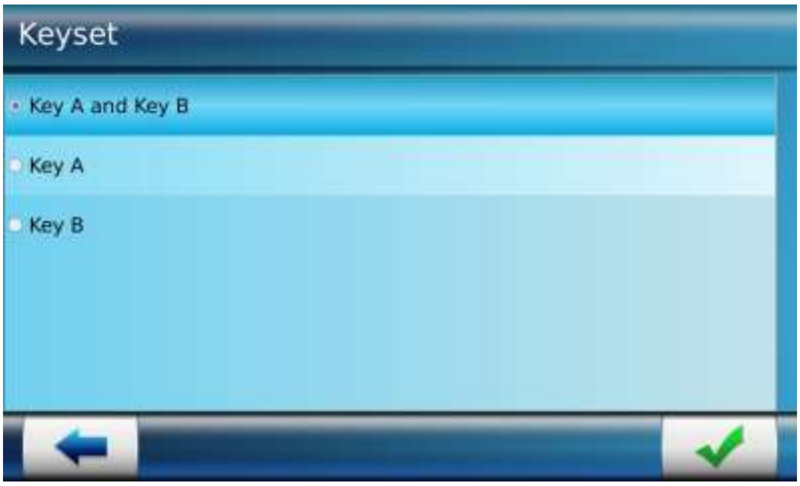
The administrator can select a key set that is used by terminal for authentication and reading MIFARE® cards, by means of this functionality. Following are the key set values that can be configured:

- Keys A only,
- Keys B only,
- Keys A then Keys B if failed

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Key set	✓	✗
Webserver	Control Configuration > Contactless Card > TLV contactless card configurations > MIFARE Key Policy	✓	✓

Screens & Steps



Keyset

○ Key A and Key B
○ Key A
○ Key B

Figure 112: Keyset configuration

1. Select a **keyset**
2. Press on check "✓" button to save changes

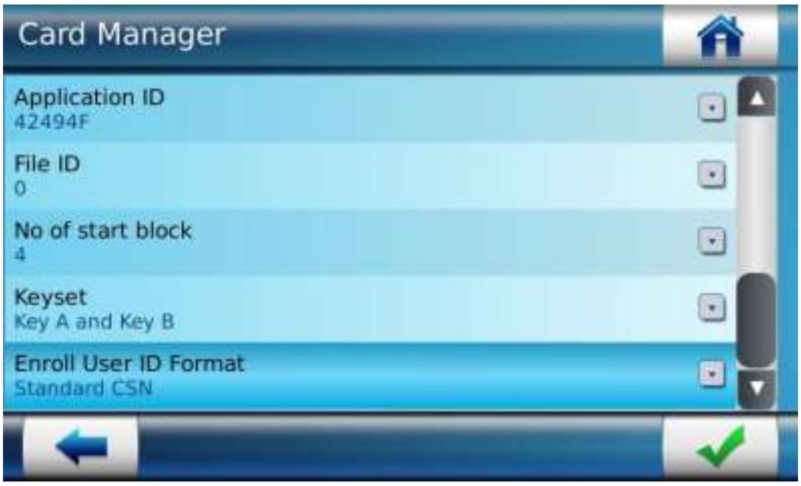
Select Enroll ID Format

The administrator can set the User ID format to be encoded on card, by using this functionality.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Enroll User ID Format	✓	✗
Webserver	Control Configuration > Contactless Card > General Parameters > Enroll User ID	✓	✓

Screens & Steps



Application ID
42494F

File ID
0

No of start block
4

Keyset
Key A and Key B

Enroll User ID Format
Standard CSN

Figure 113: Selecting Enroll User ID Format

1. Select **Enroll User ID Format**

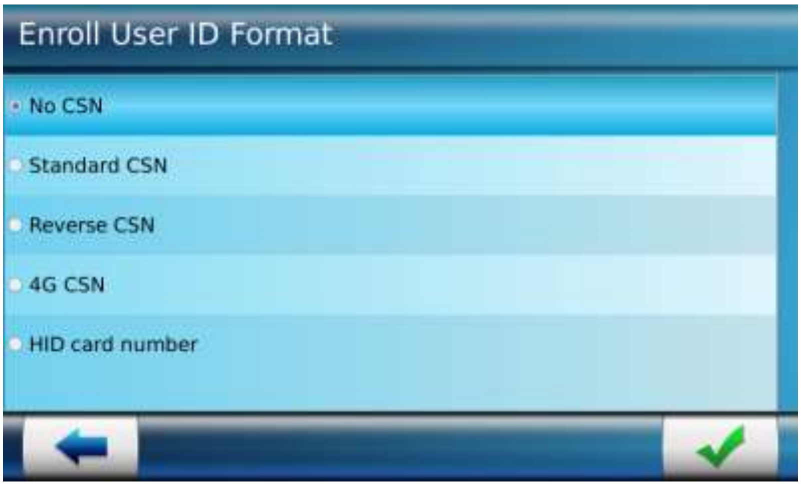


Figure 114: Selecting Enroll User ID Format

2. Select one of the following User ID formats:
    a. **No CSN**: this value indicates that the serial number on the contactless card will not be used as User ID.
    b. **Standard CSN:** This indicates that the serial number on the contactless card is considered as User ID at the time of enrolment and authentication.
    c. **Reverse CSN:** This indicates that the serial number on the contactless card in reverse byte order is considered as User ID at the time of enrolment and authentication.
    d. **4G CSN:** This indicates that the contactless card serial number read, is manipulated as per 4G terminal. Manipulation is as follows.

    e.g.

```
Step 1: CSN read from the card.
if (ICLASS)
{
        //Reverse all the bytes in case iClass card
}
else
{
        //Do not reverse
}
Step 2:
if(MIFARE)      // 4 Byte CSN card
{
        //generate decimal from 4 Byte CSN.
}
else if(DESFire) // OR any 7 BYTE CSN card
{
        //Add 0 in beginning of CSN
        //reverse the first 4-bytes and reverse the next 4-bytes.
        //reverse the whole 8-byte after above manipulation
        //generate decimal from the manipulated HEX
}
else //ICLASS CARD
{
        //reverse the first 4-bytes and reverse the next 4-bytes.
        //reverse the whole 8-byte after above manipulation
        //generate decimal from the manipulated HEX
}
```

e. **HID card number:** This indicates that the HID number read by the terminal from the iClass card serves as the User ID.

NOTE: This option is only available in iClass product.

f. **Reverse HID card number:** This indicates that the HID number read by the terminal from the iClass card is reversed to serve as the User ID.

NOTE: This option is available only in iClass product and can be set via PC application or webserver.

Partial CSN

- Configuration keys are available to use partial CSN in enroll and verify modes.
- For each of mode there are start bit key and a length key (in bits) as below.
  For Enrollment, sc.enroll_csn_start and sc.enroll_csn_length
  For Verification, sc.verify_csn_start and sc.verify_csn_length

  start bit key: range 0 to 79, default value 0
  length key: range 0 to 80, default value 0. Value 0 will be associated to the use of the full card CSN, whatever the start bit value.
- These keys are only used when the keys “Enroll” or “Verify” are set to “ReverseCSN” or “StandardCSN”.
- To use these keys, user should know length of CSN of the cards he is using. If the start bit is too high, compare to the length of the card CSN, the partial length will be equal to 0.
  Example
  CSN card: 0xE012FFFB012D89FF
  CSN Decimal value: 16146249067598285311
  CSN Binary value:
  1110000000010010111111111111101100000001001011011000100111111111
  Truncated value, using interface we propose, with programmed start bit to 11 and length to 53
  CSN Binary value: 10010111111111111101100000001001011011000100111111111
  ID Decimal value: 5348003102427647
- These keys are only accessible from PC Application or Web Server.

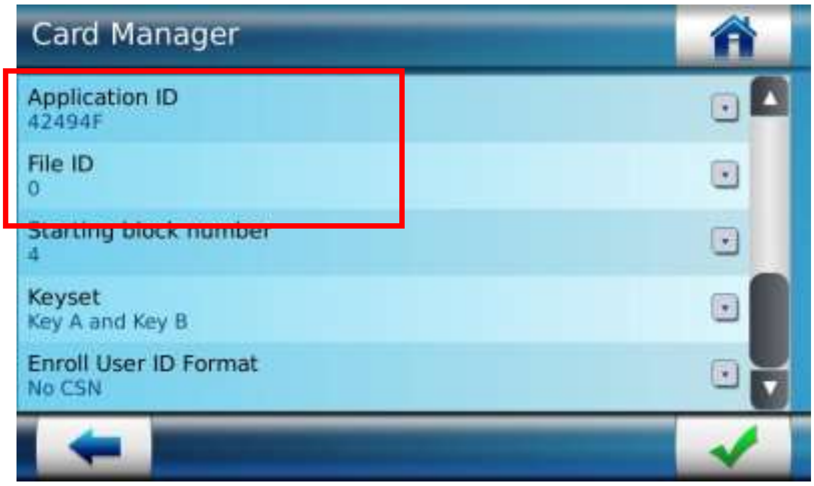
Defining Application ID and File ID for DESFIRE® Cards

The administrator can specify the value of the Application ID and File ID for reading DESFire® cards, by means of this functionality. When the DESFire® card is presented to the reader during authentication, the application ID is read from the configured location from where the active File ID is fetched which further contains the user data.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Application ID ***OR*** User Menu > Card Manager > File ID	✓	✗
Webserver	Control Configuration > Contactless Card > TLV contactless card configurations > DESFire AID ***OR*** Control Configuration > Contactless Card > TLV contactless card configurations > DESFire FID	✓	✓

Screens & Steps



Card Manager

Application ID
42494F

File ID
0

Starting block number
4

Keyset
Key A and Key B

Enroll User ID Format
No CSN

Figure 115: Configuring Application ID and File ID

1. Select **Application ID**
2. Enter Application ID from range of 0x000001-0xFFFFFF. By default, application ID 0xEEE600
3. Now select File ID
4. Enter File ID using keypad, from range of 0 – 15. By default, File ID is set as 0
5. Press on check "✓" button to save changes

Defining Offset for Reading iCLASS® Cards

The administrator can configure the offset to read the data from 2APP iCLASS® cards, by using this functionality. When the iCLASS® card is presented to the reader, the application area 2 is read after the card is authenticated with the key 2.

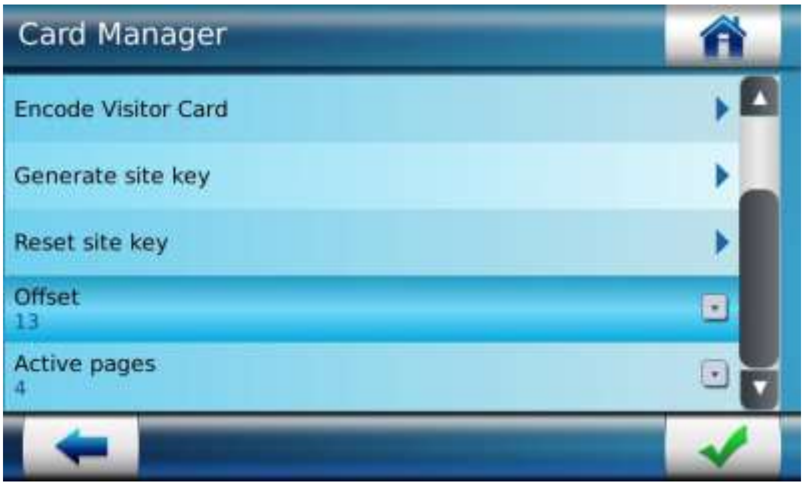
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Offset	✓	✗
Webserver	Control Configuration > Contactless Card > TLV contactless card configurations > I-Class Page Offset	✓	✓

Pre-requisites

- MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact iCLASS® terminal required to configure Offset for reading iCLASS® card

Screens & Steps



Card Manager

Encode Visitor Card

Generate site key

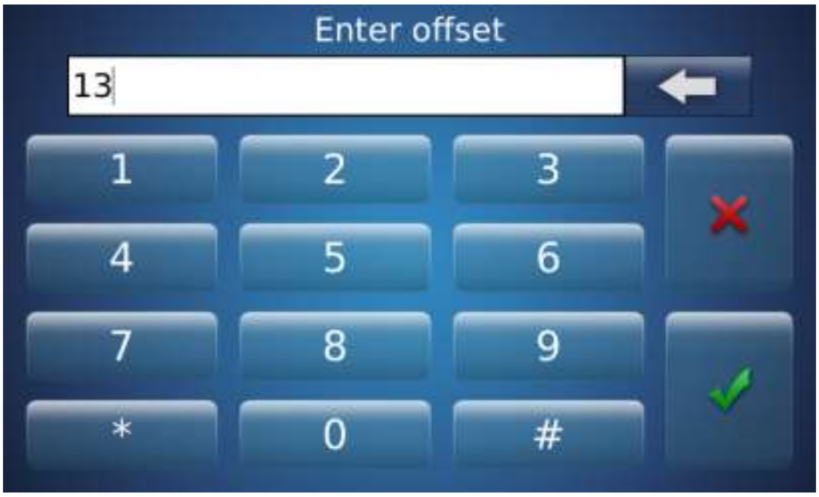
Reset site key

Offset
13

Active pages
4

Figure 116: Set Key Offset for iCLASS® cards

1. Press on **Offset**



Enter offset

13

Figure 117: Set Key Offset

2. Enter **Offset value**. An administrator can configure offset from 0x13 to 0x9F (hex values)
3. Press on check "✓" button to save the Offset value

Defining Active Pages for Reading iCLASS® Cards

The administrator can configure the active page for reading data from 16APP iCLASS® cards, by using this functionality. When the iCLASS® card is presented to the reader, the application area 2 is read after the card is authenticated with the key 2. Depending on the template and size of data stored, the number of pages shall be used in case the card is 16App iCLASS®.

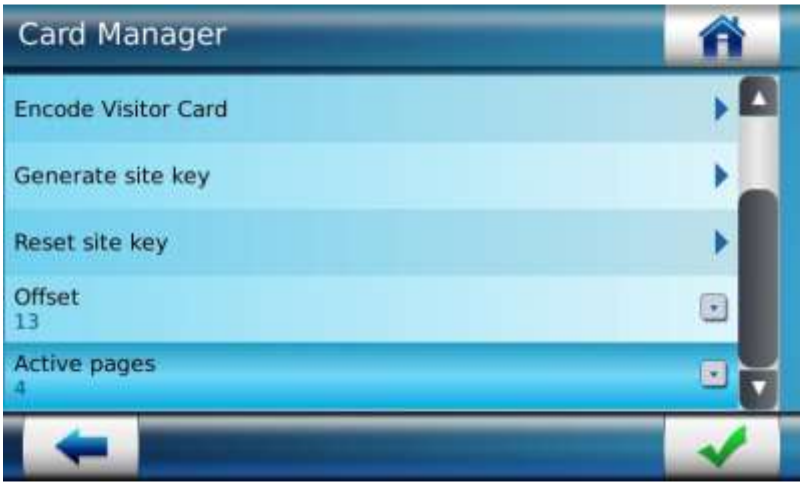
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Active Page	✓	✗
Webserver	Control Configuration > Contactless Card > TLV contactless card configurations > I-Class Page Layout	✓	✓

Pre-requisites

- The administrator needs to ensure that the MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact iCLASS® terminal is configured Active pages for reading iCLASS® card

Screens & Steps


Card Manager

Encode Visitor Card

Generate site key

Reset site key

Offset
13

Active pages
4

Figure 118: Configure Active Pages for iCLASS® cards

1. Select **Active Pages**

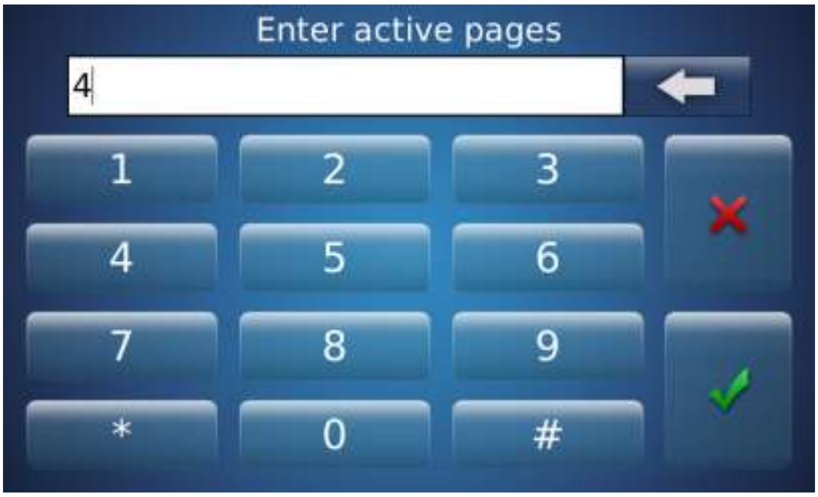


Figure 119: Enter Active Pages

2. Enter number of **Active Pages**
3. Press on check "✓" button to save

Defining ADF OID & DO TAG for HID iCLASS® SEOS® Cards

The administrator can specify the value of ADF OID and DO TAG in the MorphoAccess® SIGMA Family *MorphoWave®* Compact terminal for reading HID iCLASS® SEOS® cards by means of this functionality. Encoding from terminal is not supported.

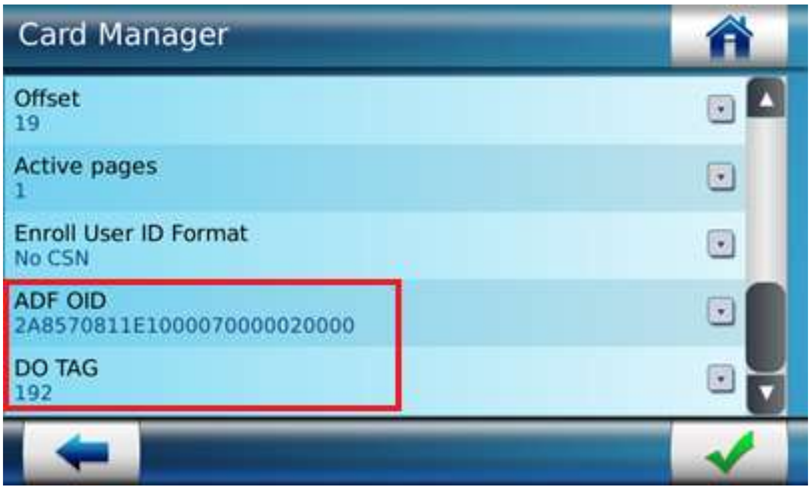
Access Path

Access point	Access Path	SIGMA Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > ADF OID User Menu > Card Manager > DO TAG	✓	✗

Pre-requisites

- The administrator needs to make sure that the bit 7 of parameter “sc.read_profile” is set to 1, in order to activate reading of HID iCLASS® SEOS® cards. Please refer to **MorphoAccess® 5G Series – Parameters Guide** document for more details.

Screens & Steps


Card Manager

Offset
19

Active pages
1

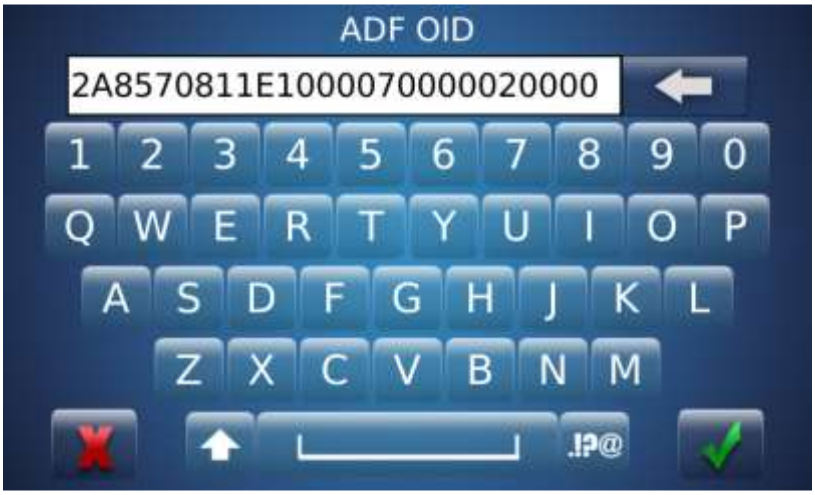
Enroll User ID Format
No CSN

ADF OID
2A8570811E1000070000020000

DO TAG
192

Figure 120: Configure ADF OID & DO TAG for HID iCLASS® SEOS® cards

1. Select **ADF OID**


ADF OID

2A8570811E1000070000020000

Figure 121: Enter ADF OID

2. Enter ADF OID number

3. Press on check “✓” button to save

4. Select DO TAG

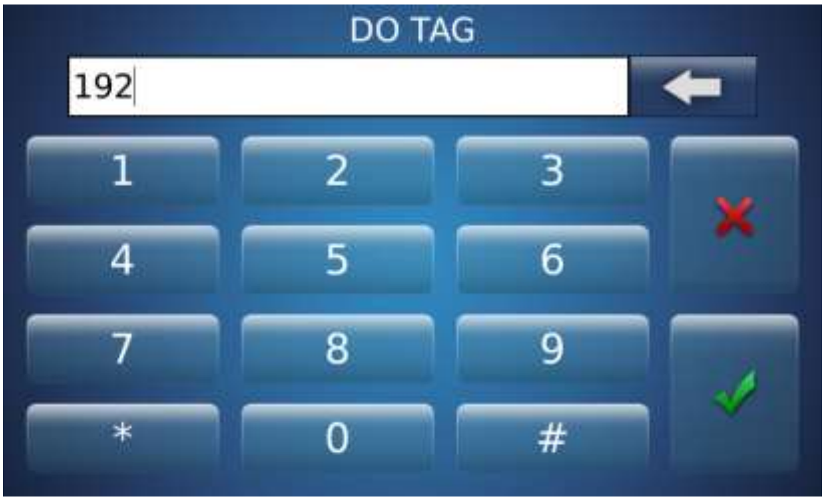


Figure 122: Enter ADF OID

5. Enter DO TAG number
6. Press on check "✓" button to save

Reset Card

The administrator can reset a contactless card, by using this functionality. The user data stored in the card is erased. Terminal will also overwrite the current site key on the card with the default site key.

Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	User Menu > Card Manager > Erase Card	✓	✗
Webserver	User Management > User Enrollment > Erase Card	✓	✓

Pre-requisites

- A smart card has user details stored.
- Card is secured with the same key as on terminal.

Screens & Steps

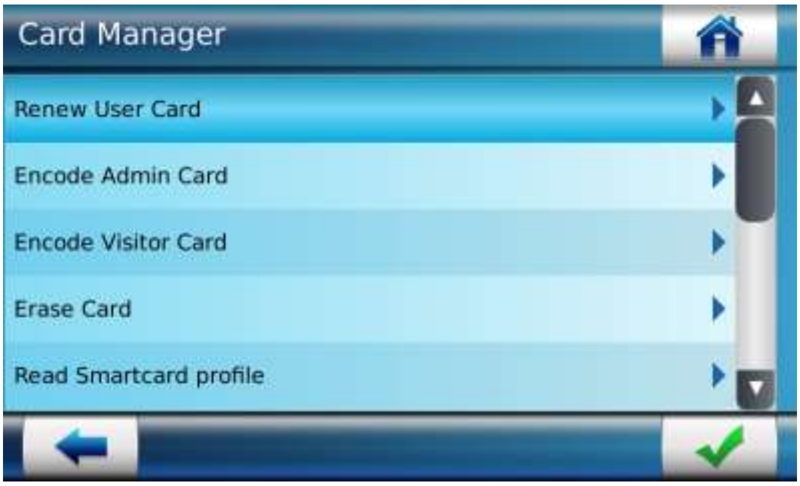
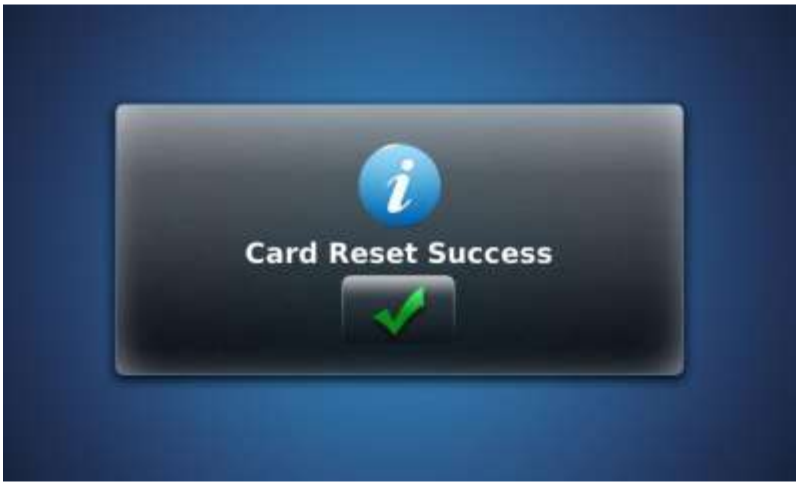


Figure 123: Reset card

4. Select **Reset Card**
5. Terminal will ask to **Place Card** at card reader.
6. Once the administrator places the card, terminal will read and reset the card by erasing the stored data. This will also reset the card key to default value.



Card Reset Success

Figure 124: Success message is displayed showing card is reset successfully

Results

Card is reset successfully. Now a new user can be enrolled using this card.

Multimedia menu

The administrator can upload and manage audio, video and images on MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, by using the multimedia menu. These multimedia contents are used to perform various tasks such as to play an alarm when the terminal is tampered.

The administrator needs to refer to the following sections in order to understand as to how one can upload the multimedia contents in the terminal and the supported formats. Terminal can play multimedia files contained in **MKV** (video), **WEBM** (video), **OGG** (audio), and **WAV** (audio) container.

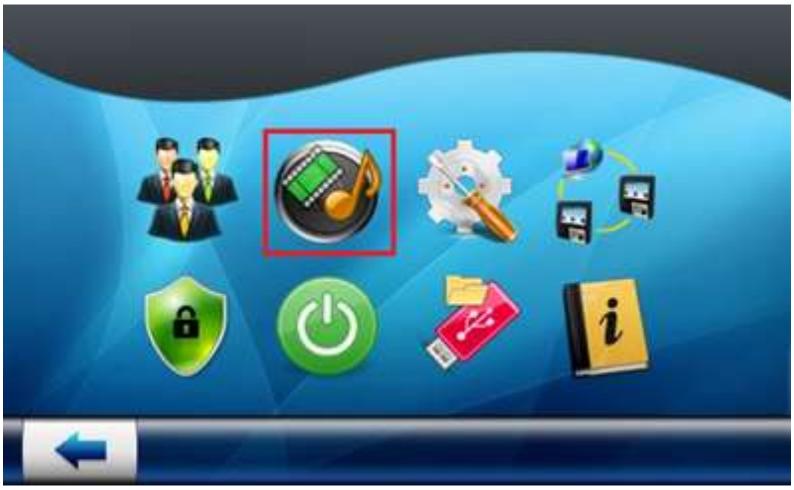


Figure 125: Multimedia Menu

Audio Settings

The administrator can configure the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal to play a notification sound on the following events:

- **Access Denied:** Audio is played when user verification has failed and access is denied
- **Access Granted:** Audio is played when user verification is successful and access is granted
- **Message Attention:** Audio is played on instances such as door is left opened
- **Tamper Detection:** Audio alarm is played when tamper is detected

Using Audio settings an administrator can perform the action listed below:

- The administrator can upload Audio files using USB mass storage device to specific folders that can be found in the Multimedia Menu > Audio path. Please note that each folder will be having a unique name that corresponds to the action or event which leads to a notification sound. For e.g., the administrator must ensure that the audio that is to be played on event of a tamper need to be uploaded in the Multimedia Menu > Audio > Tamper folder.
- Set the volume at which the sound should be played
- The administrator can delete the audio file corresponding to a given event, in case it is not required to notify that event with a sound.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Multimedia Menu > Audio	✓	✗

Pre-requisites

- The administrator must make sure that the USB mass storage device has been properly initialized. This implies that the USB mass storage device must have exactly the same folder structure as displayed on the terminal. For example, the Audio to be played on tamper detection should be stored in the 'Tamper' folder. Refer to "*Initialize USB Mass Storage device*" section to understand as to how to initialize a USB mass storage device.

- The maximum supported Audio file size is up to 500KB
- Supported audio file formats are FLAC, PCM, and VORBIS
- The administrator must ensure that the audio messages must be in the same language, as configured in the terminal

Screens & Steps

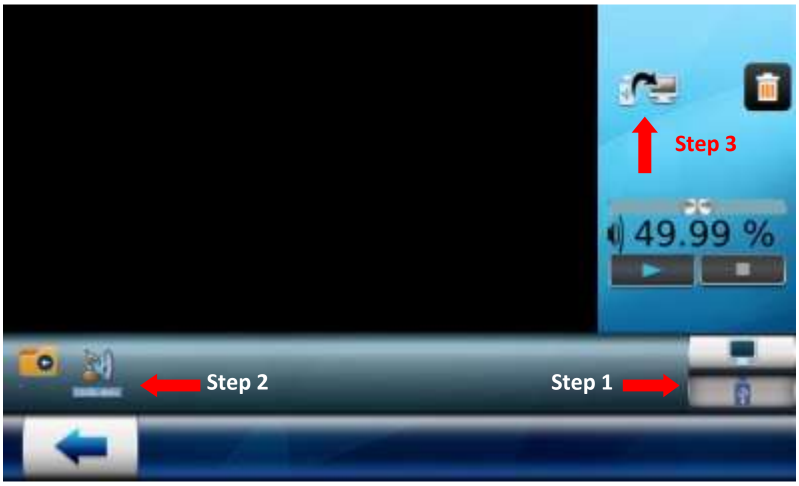
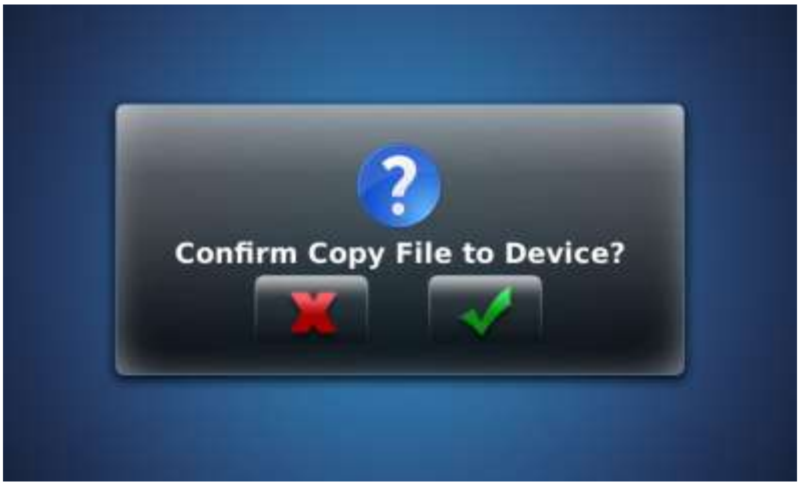


Figure 126: Uploading Audio File in device

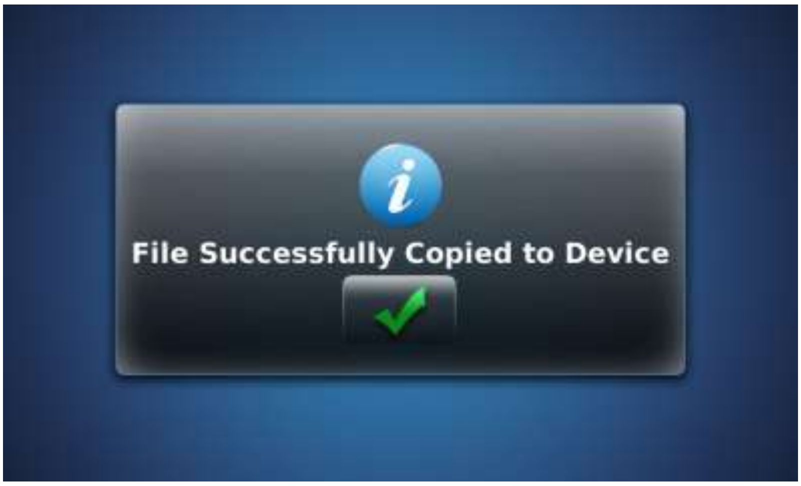
1. Select **USB mode**
2. The administrator can view the folders present in USB mass storage device.
3. Select an Audio file that is required to be uploaded on terminal
4. The administrator can play the audio file and also adjust its volume
5. Press on **Copy** button to copy file from USB mass storage device to Terminal



Confirm Copy File to Device?

Figure 127: Confirmation Pop-up

6. A confirmation pop-up will appear. Press on "✓" icon to copy file from USB mass storage device to terminal



File Successfully Copied to Device

Figure 128: Success message is displayed

Results

Success message is displayed showing Audio file is copied to terminal. Audio is played on respective action on terminal.

The administrator can use the"🗑" button to **Delete** an audio file.

Video Settings

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is capable of playing video when screen is idle. The administrator can configure the following, by using Video settings:

- Upload Video files using USB mass storage device
- Set the volume at which the sound should be played
- Remove video file. In this case, No video will be played when the screen is idle.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Multimedia Menu > Video	✓	✗

Pre-requisites

- The administrator must ensure that the USB mass storage device must be properly initialized. This implies that the USB mass storage device must have the same folder structure as displayed on the terminal. For example the administrator must place the video to be played on idle screen time under the folder named ‘Idle Screen’. The administrator can refer to “*Initialize USB Mass Storage device*” section in order to understand the process of initializing a USB mass storage device.
- The maximum supported Video file size on MorphoAccess® SIGMA series terminal is up to 10MB
- The maximum supported Video file size on MorphoAccess® SIGMA Extreme series terminal is up to 50MB
- Supported Video files formats are MPEG-4 and VP8

Screens & Steps

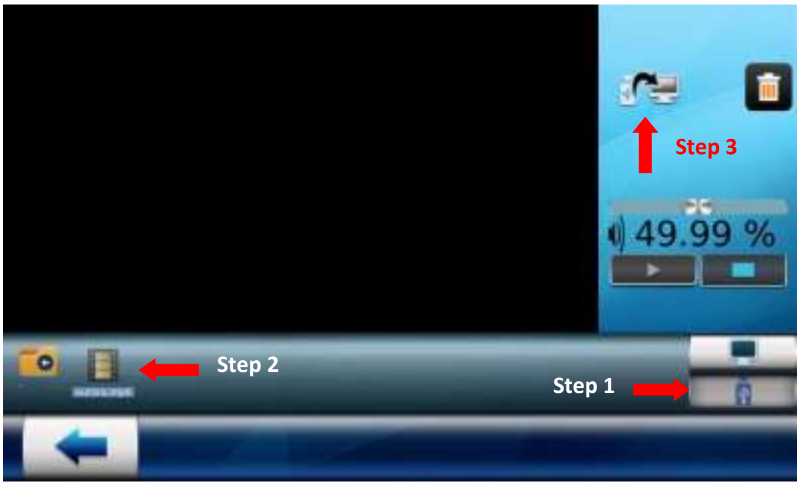


Figure 129: Uploading Video File in device

1. Select **USB Mode**
2. The administrator can view the folders present in USB mass storage device.
3. Select a **Video File** that is required to be uploaded on terminal
4. The administrator can play video file and also adjust its volume
5. Press on Copy button to copy file from USB mass storage device to Terminal

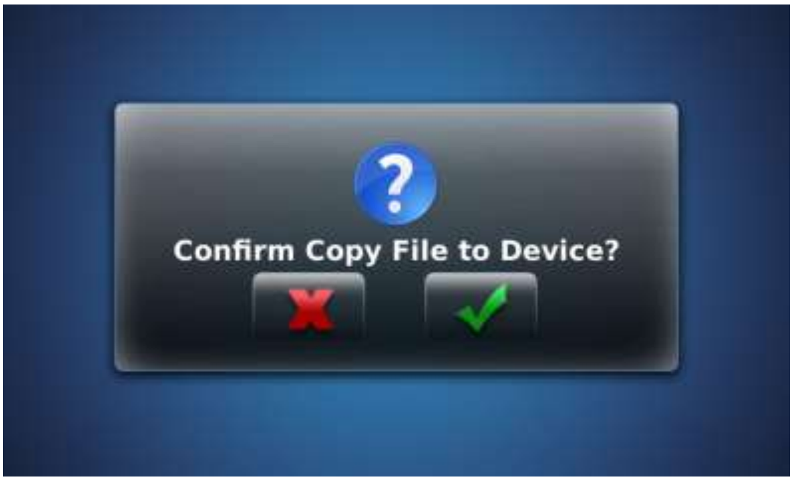
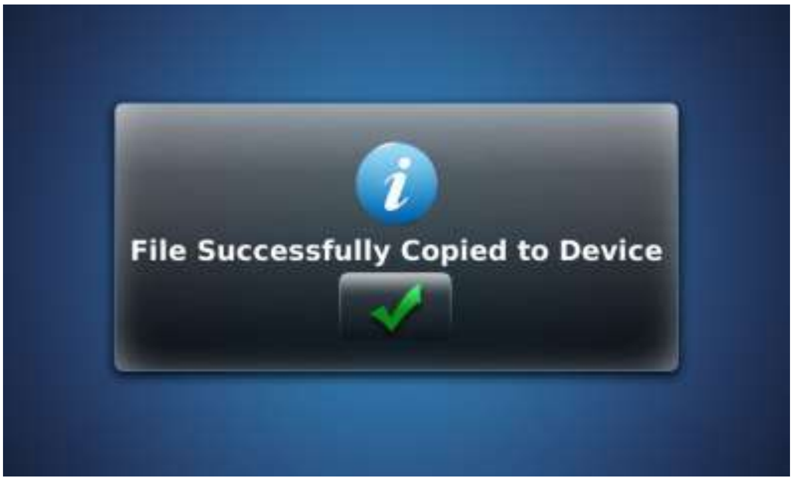

Confirm Copy File to Device?

Figure 130: Confirmation Pop-up

A confirmation pop-up will appear. Press on "✓" icon to copy file from USB mass storage device to terminal



File Successfully Copied to Device

✓

Figure 131: Success message is displayed

Results

Success message is displayed showing Video file is copied to terminal. The uploaded video is played on idle screen time out.

The administrator can click on the "🗑" button to **Delete** a video file.

References

- Refer to "Idle Screen Time Out" parameter under LCD Configuration
- The administrator needs to refer to the parameter "Set Infinite Video Play" under LCD Configuration, in order to set the time duration for which the video is played.

Images Settings

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is capable of displaying images on the LCD screen. The images can be used for purposes listed below:

- **Dynamic Message:** The administrator must set the "Dynamic Message Configuration" as ON at the time of user enrolment if it is required to display an image when the user is granted access.
- **Wallpaper:** This is to set wallpaper to be displayed on the home page.
- **AccessGrantedLogo:** This is to set customize logo to be displayed on terminal LCD for access granted event. When the user is granted access, this customize logo will display rather than default green color logo. The administrator can set to be displayed only logo without "Access Granted" string by uploading user defined LCD language file with empty transalation of "Access Granted" string.
- **AccessDeniedLogo:** This is to set customize logo to be displayed on terminal LCD for access denied event. When the user is denied access, this customize logo will display rather than default red color logo. The administrator can set to be displayed only logo without "Access Denied" string by uploading user defined LCD language file with empty transalation of "Access Denied" string.
- **CardAnimation:** This is to set customize animation to be played on LCD when terminal is idle and trigger event is set to card only
- **BiometricAnimation:** This is to set customize animation to be played on LCD when terminal screen is idle and trigger event is set to biometric only.
- **QRAnimation:** This is to set customize animation to be played on LCD when terminal screen is idle and trigger event is set to QR Code only.
- **CardBioAnimation:** This is to set customize animation to be played on LCD when terminal screen is idle and trigger event is set to card + biometric only.
- **QRFingerAnimation:** This is to set customize animation to be played on LCD when terminal screen is idle and trigger event is set to QR code + biometric only.
- **CardQRCodeAnimation:** This is to set customize animation to be played on LCD when terminal screen is idle and trigger event is set to QR code + Card only.
- **CardQRBioAnimation:** This is to set customize animation to be played on LCD when terminal screen is idle and trigger event is set to Card + QR code + biometric only.

The administrator can perform the following actions, using Image Settings:

- Upload image files using USB mass storage device
- Remove image file. No image will be displayed in this case.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Multimedia Menu > Image	✓	✗

Pre-requisites

- The administrator must correctly initialize the USB mass storage device, please refer to "*Initialize USB Mass Storage device*" section to understand as to how to initialize a USB mass storage device.
- Terminal can support Image file formats such as JPEG, GIF, PNG, and BMP.
- SD card must be plugged into the terminal in order to activate dynamic message feature.

Screens & Steps

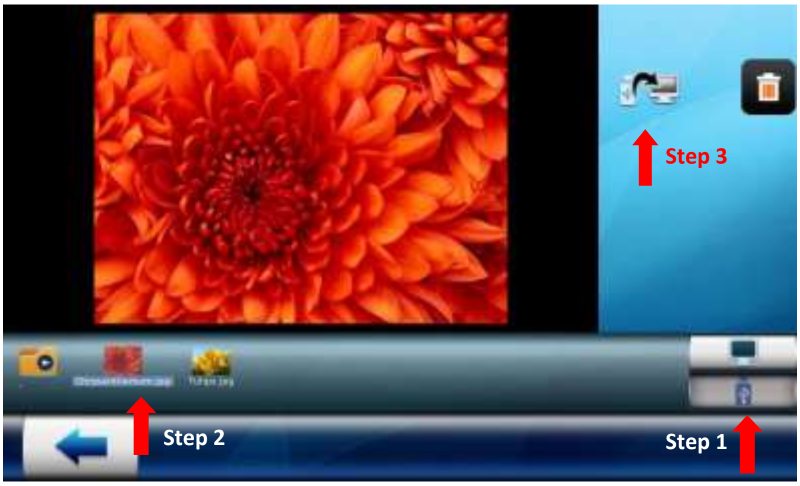


Figure 132: Uploading Image File in device

1. Select **USB mode**
2. The administrator can view the folders present in USB mass storage device
3. Press on **Copy** button (Step 3 in above figure) to copy file from USB mass storage device to Terminal

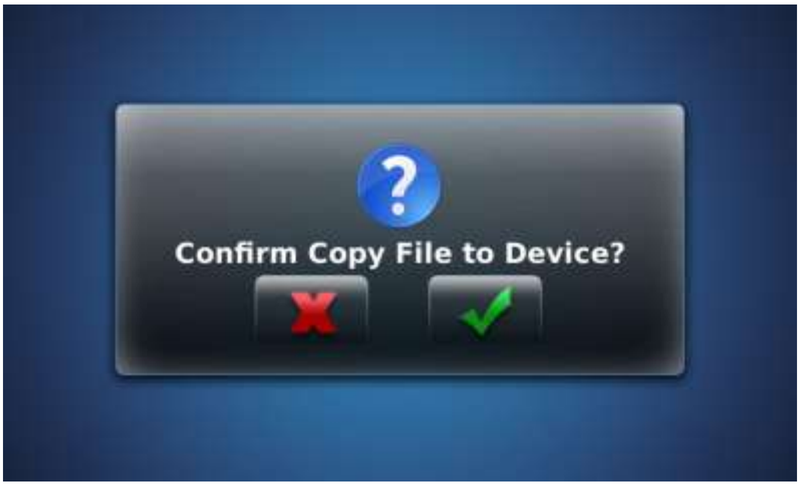
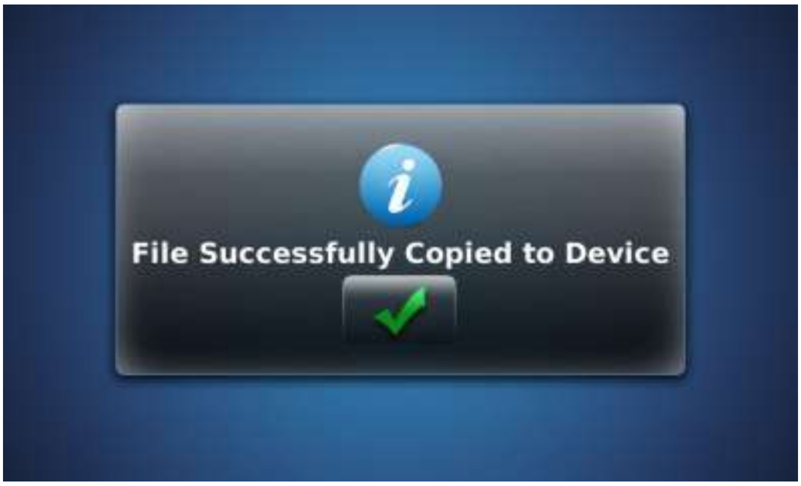

Confirm Copy File to Device?

Figure 133: Confirmation Pop-up

4. A confirmation pop-up will appear. Press on "✓" icon to copy file from USB mass storage device to terminal



File Successfully Copied to Device

Figure 134: Success message is displayed

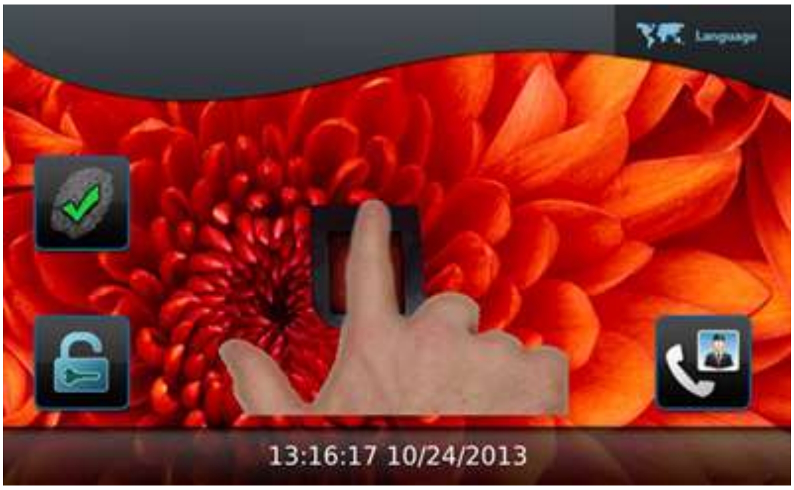


Figure 135: Image uploaded is displayed as wallpaper

Results

Success message is displayed showing image file is copied to terminal. The uploaded image is displayed as wallpaper or dynamic message.

The administrator can select and **Delete** images using "🗑" button.

System Menu

The administrator can configure fundamental parameters of Terminal such as LCD screen parameters and transaction log settings, using the System menu. System menu also allows an administrator to launch the First Boot Assistant that has all basic parameters in one screen.

Only an administrator with full administrative rights can access this menu.

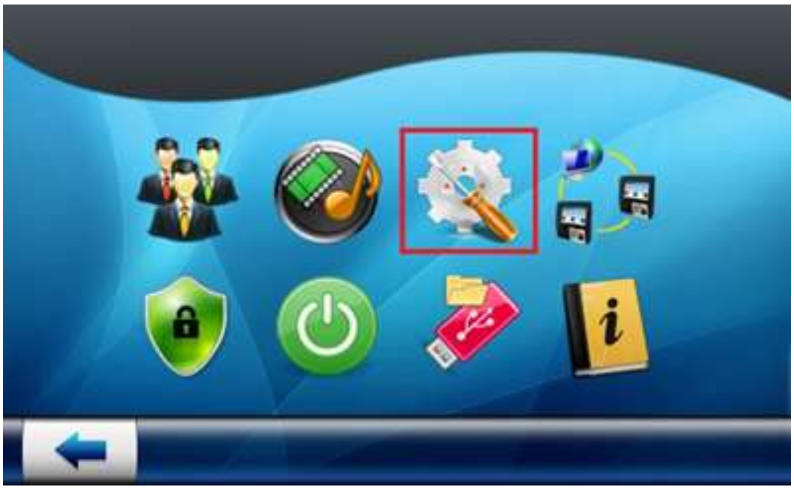


Figure 136: System Menu

Terminal Configurations

Set Factory Default

The administrator can use this functionality for resetting all the parameters of MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal to their default value. It can be done through GUI, Webserver and hardware settings.

Through GUI/Webserver

While resetting the terminal through software, an administrator can select particular parameters manually, for which values are needed to be reset as factory default value.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series *MorphoWave®* Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > Set Factory Default	✓	✗
Webserver	Webserver > Reset Default	✓	✓

Screens & Steps

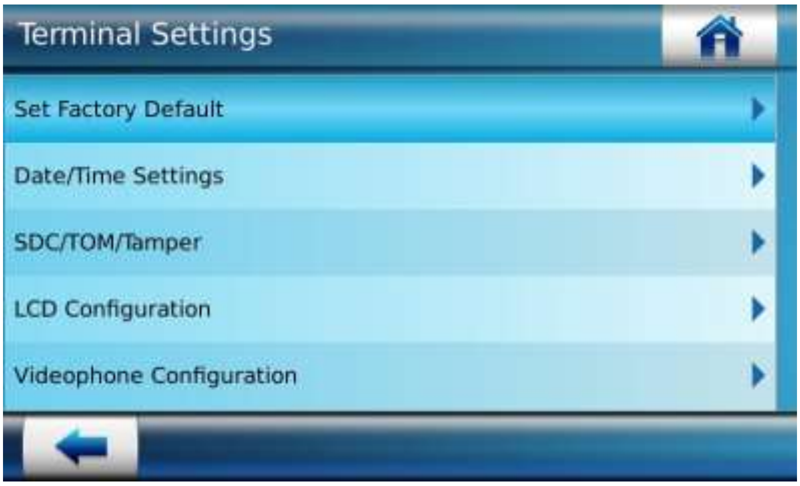
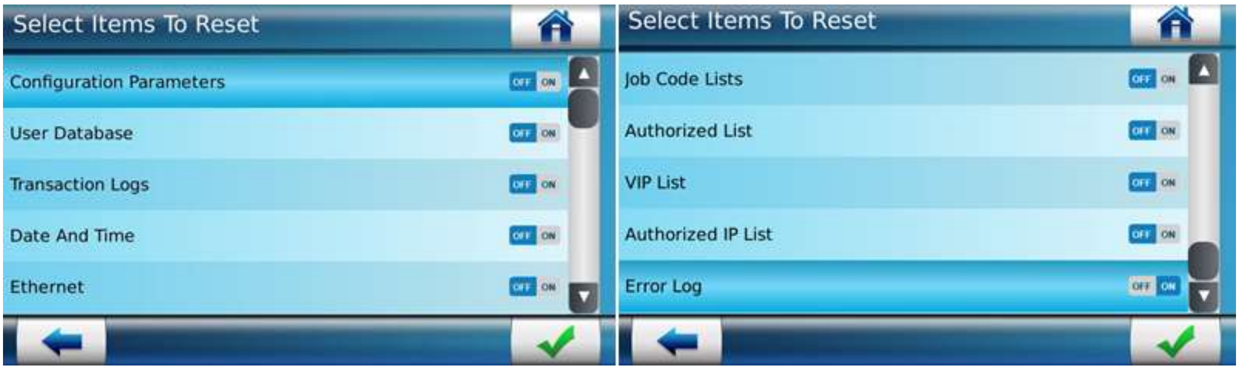


Figure 137: Reset Factory Default Settings

1. Select **Set Factory Default**



Select Items To Reset

Configuration Parameters OFF ON

User Database OFF ON

Transaction Logs OFF ON

Date And Time OFF ON

Ethernet OFF ON

Select Items To Reset

Job Code Lists OFF ON

Authorized List OFF ON

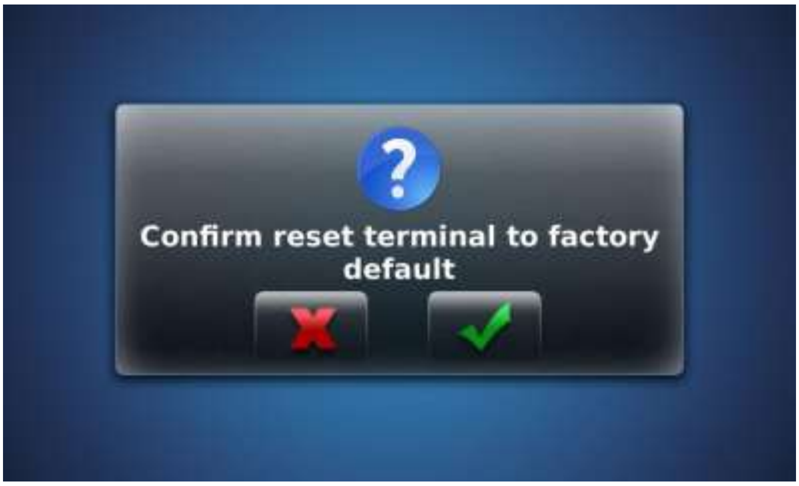
VIP List OFF ON

Authorized IP List OFF ON

Error Log OFF ON

Figure 138: Select Items to reset

2. The administrator can select parameters from the list and set as ON. The parameters that are marked ON, will be reset.
3. Press on check button to move next



Confirm reset terminal to factory default

Figure 139: Confirmation message displayed

4. Select check button to confirm resetting of selected parameters of the terminal to factory default settings

Results

The values of selected parameters will be reset at their default values.

Through Hardware Settings

This feature allows the administrator to reset the terminal to factory default settings through hardware settings i.e. by connecting a combination of GPIO and Wiegand external pins as described below:

Steps to perform Factory Reset through Hardware settings

Step 1 : Power off the terminal

Step 2 : The terminal is detached from the wall

Step 3 : Access the external pins of the terminal and connects the following pins:

- GPO_0 to the WIEGAND_IN0
- GPI_1 to the WIEGAND_OUT1

Step 4 : Power-on the terminal

Step 5 : After the terminal power on, the terminal is reset to the factory settings

List of setting to be reset

1. Clear all databases
2. Remove all custom files
3. Clear KMS
4. Set all the configuration parameters to default value

Note

The reset will occur only when the hardward pins are connected and the tamper is triggered for the terminal (i.e. terminal is detached from the wall).

Date and Time Configuration

The administrator can set the time zone, current date and time in the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, by means of this functionality. Besides this, there are options to set the format of date and time. The administrator needs to configure these basic parameters on the first boot of the terminal.

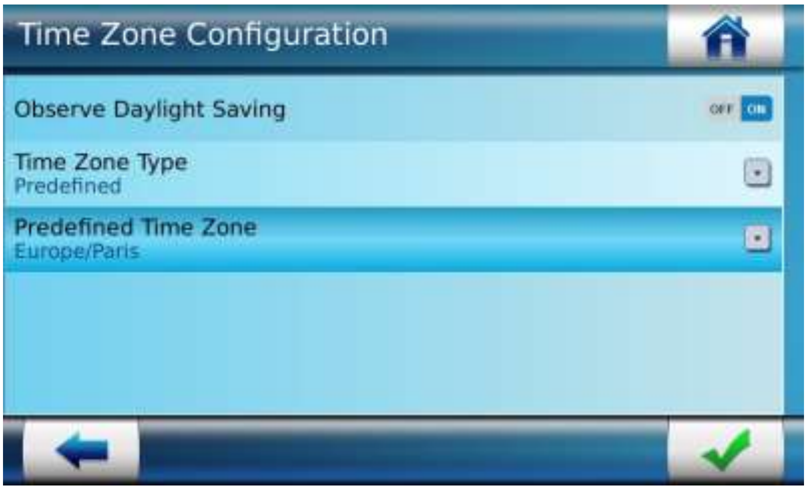
NOTE: The time stored in the product is not lost if power supply is removed for up to 48 hours.

Set Time Zone

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > Date and Time Settings > Time Zone Configuration	✓	✗
Webserver	Terminal Settings > Date Time	✓	✓

Screens & Steps


Time Zone Configuration

Observe Daylight Saving — OFF ON

Time Zone Type
Predefined

Predefined Time Zone
Europe/Paris

Figure 140: Configuring Time Zone

1. Please refer to the "*Date and Time Configuration"* section step #11 to 21 for more details.

Results

Based on the selected time zone, the time and date will be calculated and set in the terminal. During Daylight Saving, the time will be auto-adjusted.

Network Time Protocol Server (NTP Server)

This functionality is used to synchronize the terminal date and time with external server using SNTP/NTP protocol, to update the terminal date and time automatically with the NTP server time. This can be done from the Webserver using the same path as mentioned above.

Set Date

The administrator can configure the current date and the format in which it is to be displayed on the terminal, by using this functionality.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > Date and Time Settings > Clock Parameters > Date Configuration	✓	✗
Webserver	Terminal Settings > Date Time	✓	✓

Screens & Steps

Please refer to "*Date and Time Configuration*" section step #1 to 4 for more detail.

Set Time

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > Date and Time Settings > Clock Parameters > Time Configuration	✓	✗
Webserver	Terminal Settings > Date Time	✓	✓

Screens & Steps

Please refer to "*Date and Time Configuration*" section step #4 to 9 for more detail.

Results

The administrator can view the configured date and time at the bottom of the home screen on the terminal.

Single Door Controller (SDC) Configuration

The administrator can configure the Single Door Controller (SDC) parameters in order to control the access through a door when specific actions are triggered on MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal. For example, on successful identification of a user, door must open automatically to allow the user into the premises.

SDC Configuration allows an administrator to set either of the two states as below:

GPIO General Mode:

General Purpose Input Output (GPIO) mode is used for passing multiple signals to the door panel when an action is triggered on the terminal. By default, GPIO Mode is enabled.

- **GPI:** General Purpose Input (GPI) has three TTL lines available, i.e., Line 0, 1 and 2. The administrator can configure a GPI line **to trigger an action on the terminal from a distant system**, when set as active (low and/or high). The administrator can activate multiple lines for same action or multiple actions. The signal is sent when following actions are triggered on terminal:
- **Delete Templates**: On selection of this action, terminal will erase all the biometric templates of specified template ID i.e. if more than one template are available with different index then all those templates will be removed. The signal is sent when following actions are triggered on terminal.
- **Reboot Terminal**: This action will reboot terminal
- **Alarm**: Terminal will buzzer the alarm for 5 seconds. This alarm can be stop from Tamper screen with Reset, even though it is not really a Tamper Alarm.
- **GPO:** General Purpose Output has three TTL line available, i.e. Line 0, 1 and 2. **Terminal can send Signals** simultaneously through multiple configured GPO lines to the door panel. The signal is sent when following actions are triggered on terminal:
- **Verify/Identify Passed**: After a successful verification
- **Verify/Identify Failed**: After verification failed
- **Finger not Detected**: When finger is not detected as per requirement
- **Full Administrator User:** When administrator with full administrative rights tries to login, an action is triggered on GPO line
- **Biometric Administrator User:** When administrator with database (biometric) administrative rights tries to login, an action is triggered on GPO line
- **Device Boot up**: When a terminal is booted up, either from a power cycle or from a soft reboot.

- **Tamper Occurred**: When Tamper Mode is enabled and if tamper gets triggered i.e. Physical movement of the terminal housing triggers a reed switch which in turn activates user specified Tamper options on the terminal.
- **Duress Finger Detected**: When Duress Mode is enabled at Wiegand line and duress finger is detected.
- **Banned Listed Card:** When the card detected is in Banned List, and user tries to access, an action is triggered through GPO line to the door panel for denying access
- **User not in Authorized List:** When user is not in Authorized listed, action is triggered on GPO line
- **Pin Mismatch:** When PIN entered by user is not matched, an action is triggered through GPO line to the door panel
- **Time and Attendance Action:** If parameters are configured in time and attendance configuration, then on every T&A action, an action is triggered GPO line to door panel/distant systems

NOTE: The settings of GPIO can be done from Web Server. Please refer to the section "*General Purpose Input Output Configuration*" in this document.

SDC Mode:

The administrator can configure Single Door Controller (SDC) mode for controlling access of a single door. Various parameters such as door unlock duration, alarm when door held open, and time over mode can be configured to control access at a particular door. When SDC mode is enabled, GPIO mode is disabled.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > SDC/TOM/Tamper > SDC Parameters	✓	✗
Webserver	Terminal Settings > SDAC	✓	✓

Screens & Steps

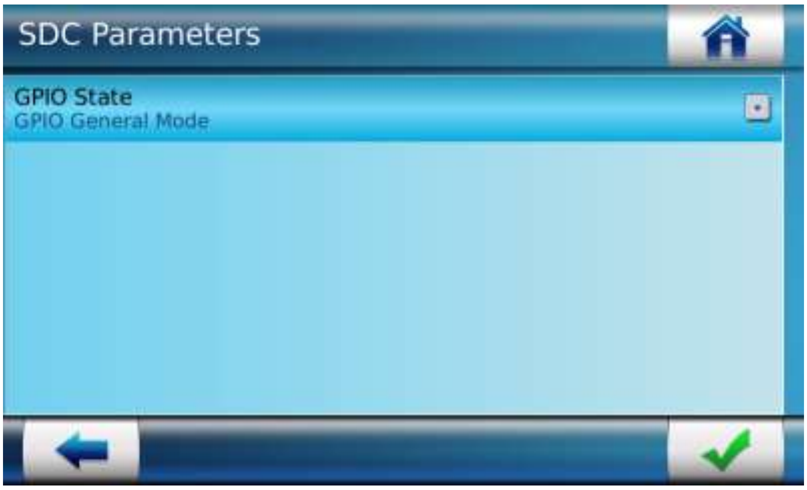


Figure 141: SDC Parameters configuration

1. Press on **GPIO State** to select modes

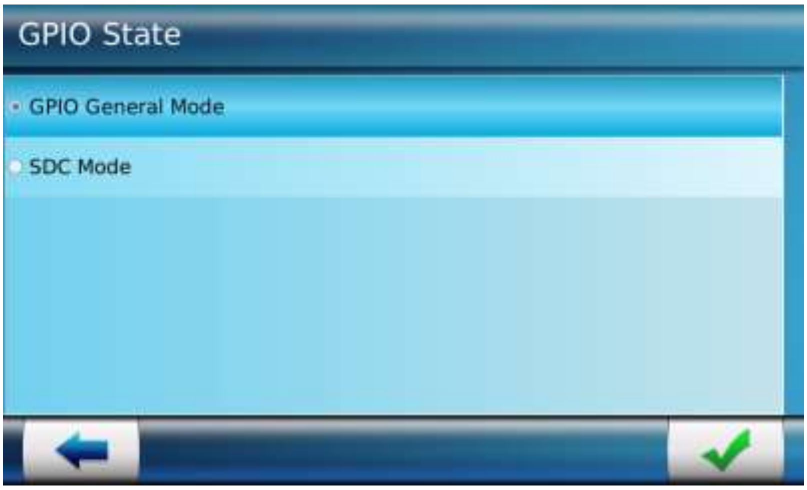
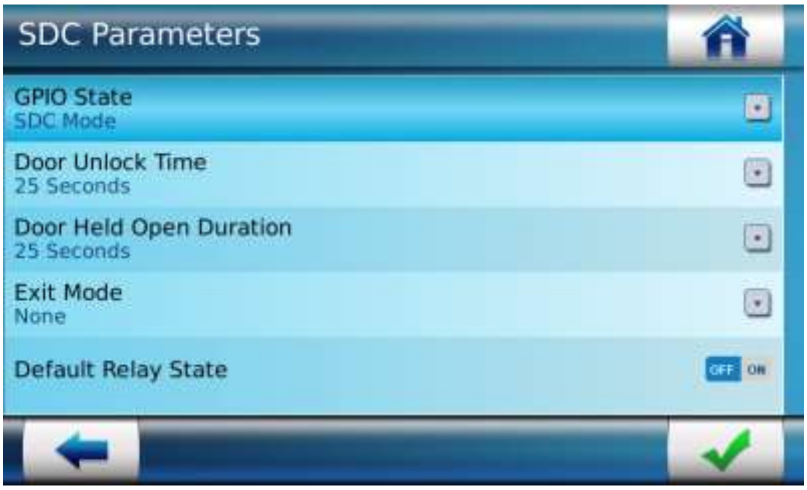


Figure 142: Selecting GPIO State

2. By default “**GPIO General Mode**” is selected. In order to configure SDC on a terminal, select **SDC Mode**
3. Use Check Button “✓” to save settings



SDC Parameters

GPIO State
SDC Mode

Door Unlock Time
25 Seconds

Door Held Open Duration
25 Seconds

Exit Mode
None

Default Relay State

Figure 143: Configuring Parameters in "SDC Mode"

The administrator can select the following parameters when the **SDC Mode** is enabled.

4. Press on **Door Unlock Time** field to set the duration (in Seconds only) for which the door should be unlocked after access is granted. E.g. if 25 seconds is the Door Unlock Time, then the door will be unlocked for 25 seconds and after that the door will be locked automatically
5. Press on **Door Held Open Duration**, to set the duration (in Seconds only) within which the door must be closed. Once Door Unlock Time has elapsed and the door has not been closed; the terminal will start counting the Door Held Open Duration. If user has not closed the door within this duration, an auto-alert "Door Held Open Too Long" will be generated on terminal
6. Select the **Exit Mode** as 'None', 'Push button – Manual' or 'Push button – Electric'
7. The administrator needs to set the **Egress Time Out** when Exit Mode is in 'Push Button-Manual' mode. Within the **Egress Time Out** period, the door will remain open and on timeout it will lock automatically. An **Egress Time Out** should be configured between the range of 1 to 300 seconds
8. The administrator can Select **Default Relay State** as 'On' or 'Off' which translates to 'powered' or 'unpowered'.
    a. "OFF" indicates that by default the internal relay will be unpowered and on access granted the internal relay state will change to high (it will be powered).
    b. "ON" indicates that by default the internal relay will be powered and on access granted the internal relay state will change to low (it will be powered off).

Time Override Mode (TOM) Configuration

The administrator can temporarily suspend the need for verification of a user for a specific time period, by using the Time Override Mode (TOM). Whenever TOM is triggered on terminal then door gets unlocked and user can open Door without any authentication till TOM remains active.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > SDC/TOM/Tamper > TOM Parameters	✓	✗
Webserver	Terminal Settings > SDAC > Enable Time Override Mode and Time override Mode Timeout	✓	✓

Pre-requisites

- Single Door Access Controller (SDAC) must be enabled

Screens & Steps

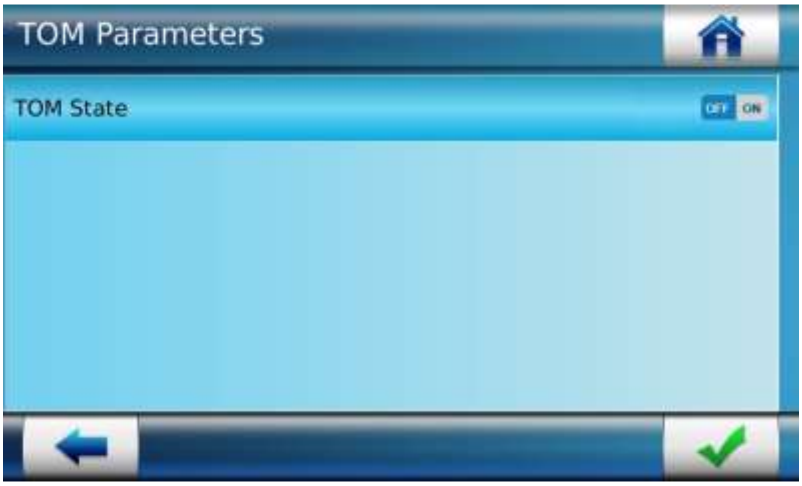
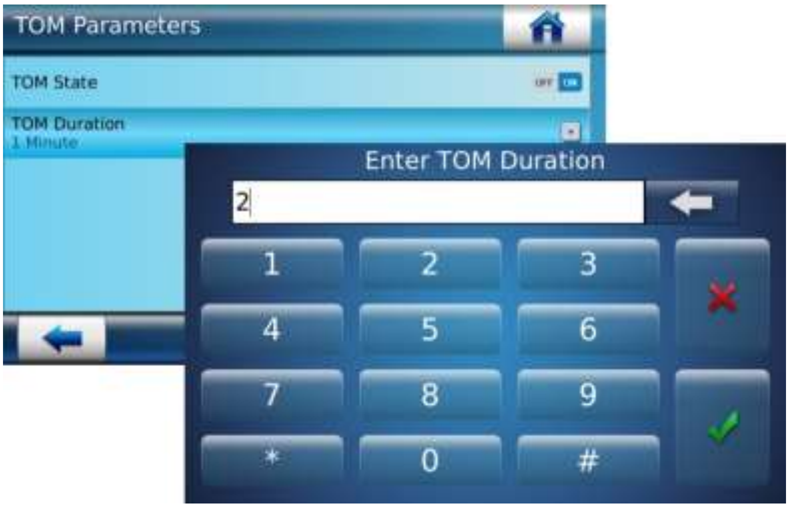


Figure 144: Selecting TOM State as On

1. Select **TOM State** as ON



TOM State: OFF ON

TOM Duration: 1 Minute

Enter TOM Duration: 2

Figure 145: Setting TOM Duration

2. Press on **TOM Duration** to set the duration for which door should be under TOM
3. Enter the number of minutes TOM will be active into the Time Override Duration field and use "✓" button to save
4. Use Check button "✓" to activate TOM on the terminal.

Results

The TOM is set successfully. Thirty seconds before TOM is set to expire, the terminal beeps. After TOM expires, the terminal returns to using the existing SDC settings.

Tamper Configuration for Terminal Security

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal can detect two types of intrusion attempts:

- Someone tries to steal the complete terminal,
- Someone tries to open the terminal

The administrator can configure the Tamper parameters in order to take necessary actions on tampering of the terminal. In the event of an intrusion (tamper), Tamper switch is triggered on terminal and Tamper alarm is played on the terminal. Terminal can also transmit an alarm indication to the central controller using a Wiegand output. For that purpose, contact connections are provided on I/O board (open circuit equals detection).

NOTE: Tamper switch triggers the alarm message. Please refer to the **MorphoAccess® Installation Guide** corresponding to your product to identify tamper switch on the terminal.

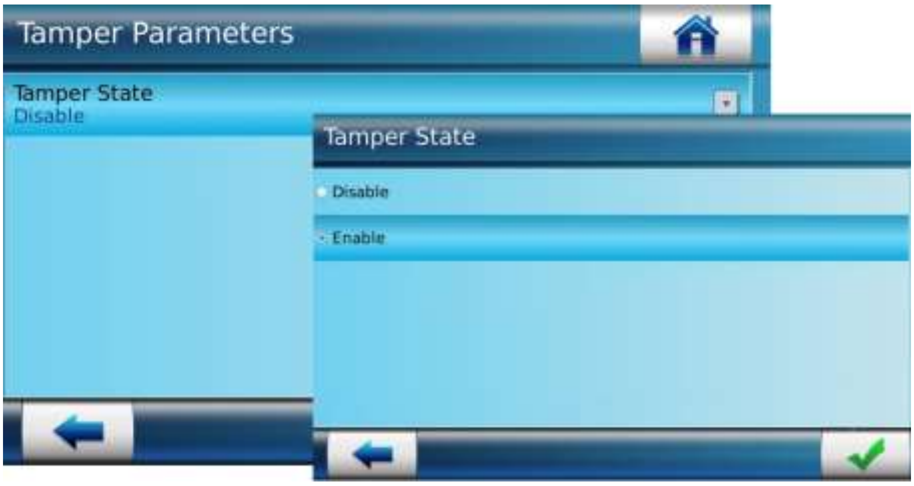
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > SDC/TOM/Tamper > Tamper Parameters	✓	✗
Webserver	Terminal Settings > Tamper	✓	✓

Pre-requisite

- The administrator must upload the Audio File for Tamper Alarm in the Multimedia settings. Only then the administrator can activate Play MMI for playing sound alarm

Screens & Steps



Tamper Parameters

Tamper State
Disable

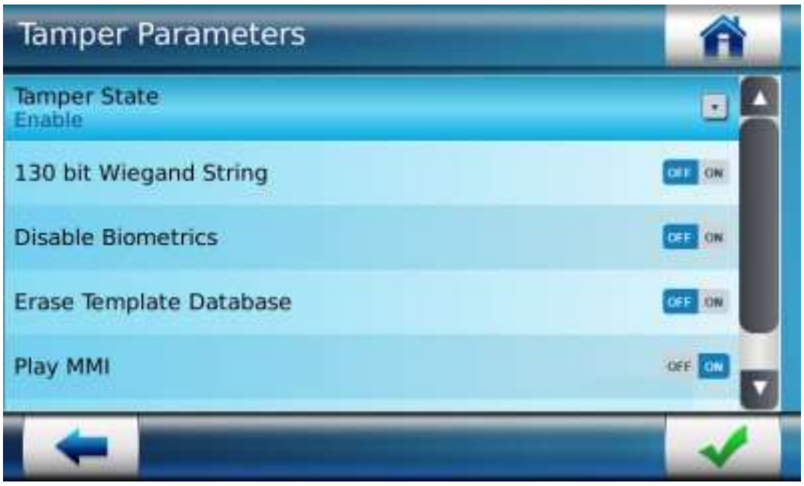
Tamper State

○ Disable

● Enable

Figure 146: Enabling Tamper

1. Press on **Tamper State**
2. In next screen, an administrator can set **Tamper State** as Disable or Enable
3. Select **Enable** and use "✓" button to Save



Tamper Parameters

Tamper State
Enable

130 bit Wiegand String OFF

Disable Biometrics OFF

Erase Template Database OFF

Play MMI ON

Figure 147: Tamper Parameters Configuration

The administrator needs to configure the following parameters, once the Tamper State is enabled:

4. **130 bit Wiegand String** can be set as ON or OFF. When this parameter is set as ON, then on tamper detection, 130 bit Wiegand string is generated for tamper alarm through a Wiegand output line
5. **Disable Biometric** The administrator can set this as ON if biometric verification needs to be disabled in the event of a tamper.

6. **Erase Template Database** The administrator turns this as ON/OFF. When ON, all the templates enrolled and saved in the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal will be deleted on Tamper detection.
7. **Play MMI** The administrator can set this as ON if it is required to play a sound alarm on tamper detection. The audio file uploaded by the administrator in the system will be played
8. **Erase Security Data** The administrator can set this as ON or OFF. When this parameter is set as ON, then on tamper detection, the custom site keys stored for all contactless cards will be deleted and reset to the default value.
9. Use “✓” button to **Save**

Results

Once the Tamper Parameters are configured, possible intrusions can be detected and personal data theft can be prevented. When tamper is triggered, sound alarm is played. Additionally all of the above mentioned actions if configured as ON, shall be carried out. Once the anti-tamper switches are closed, it is required to set the tamper state as “**Cleared and Re-enabled**”. Only then the tamper alarm will be stopped and terminal will be accessible.

LCD Configuration

The administrator can control the look and feel of the content/multimedia displayed on the LCD touch screen of MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal's LCD, by using this functionality.

Several Parameters that an administrator can configure are:

- Brightness of the touch screen LCD
- Disable Biometric Sensor when terminal is idle
- Enable or Disable Idle Mode. Basically, an idle mode is when there is no action triggered on LCD. If enabled a video is played when terminal is in Idle Mode
- Set brightness of the video to be played
- Set duration of the video to be played

Access Path

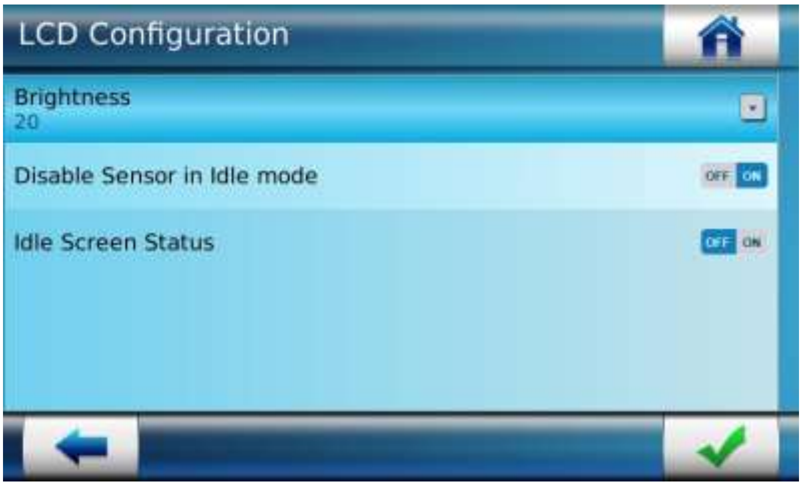
Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series	SIGMA Lite+ Series
Terminal Menu	System Menu > Terminal Settings > LCD Configuration	✓	✗	✗
Webserver	Webserver > MMI (Man-Machine Interface)	✓	✗	✓

Pre-requisites

- The administrator must upload the video that is to be played while the screen is idle, using Multimedia settings. Only then the administrator is allowed to configure the video brightness, volume and other parameters.

Screens & Steps

Screen Brightness Control



LCD Configuration

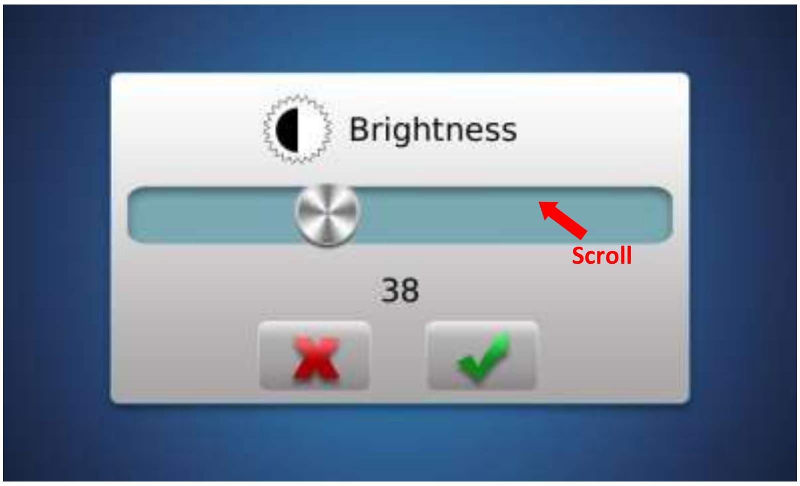
Brightness
20

Disable Sensor in Idle mode: OFF [✓ ON]

Idle Screen Status: [✓ OFF] ON

Figure 148: LCD Brightness adjustment

1. Press on **Brightness**
2. On next screen an administrator can adjust the brightness of LCD back light by scrolling the curser left or right



Brightness

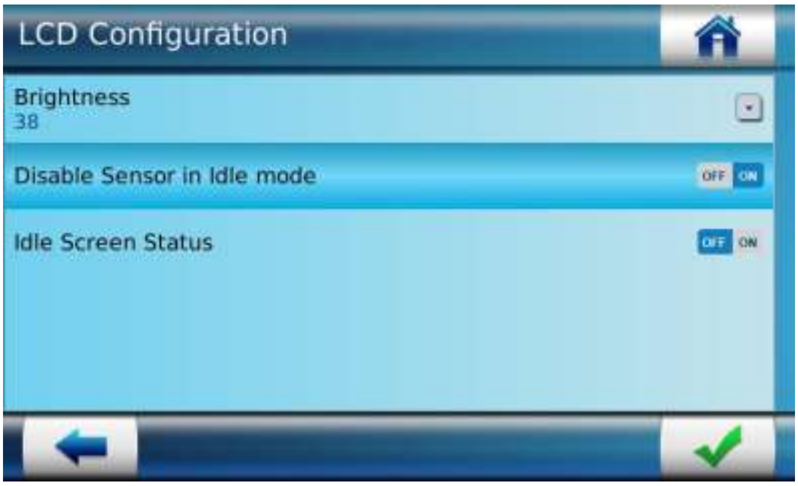
38

Figure 149: LCD Brightness adjustment

3. Move curser left to reduce brightness and right to increase brightness of the LCD
4. Use "✓" icon to **Save** setting

Disable Sensor in Idle Mode

The administrator can disable the biometric sensor backlight when terminal is in idle mode, by configuring this parameter. When turned ON, the biometric sensor will automatically power off, if the terminal is in idle mode. This is recommended for power saving. As soon as terminal is in use, the biometric sensor is powered on.



LCD Configuration

Brightness
38

Disable Sensor in Idle mode OFF [✓ ON]

Idle Screen Status [✓ OFF] ON

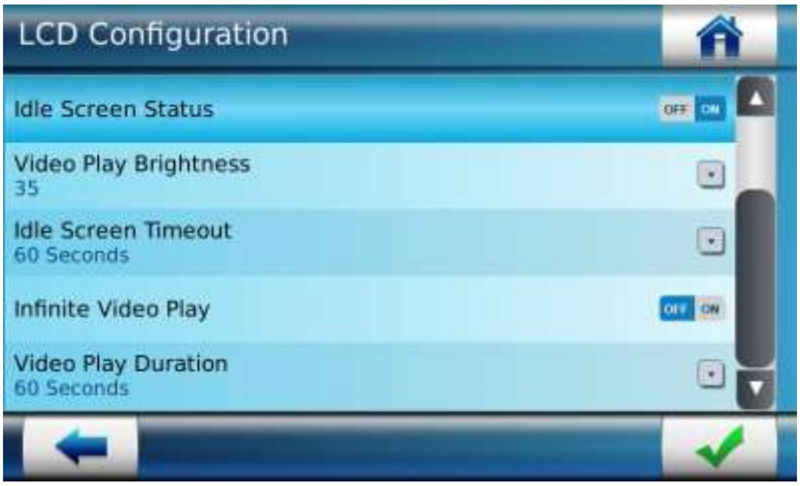
Figure 150: Disable Sensor in Idle Mode

1. Set **ON**, to disable the biometric sensor in idle mode or set it as **OFF** to keep sensor working even in idle mode
2. Use "✓" icon to **Save** setting

Idle Screen Status

The administrator sets this to be ON when it is desired that the terminal must be auto locked and a video needs to be played, incase no activity is detected on the terminal. The video to be played can be uploaded in the Idle Screen Video folder, using "Video Settings" functionality under the Multimedia menu.

When the terminal is in idle mode, the biometric sensor is powered off (if the administrator has turned the "Disable Sensor in Idle mode" parameter ON). One can exit the idle mode by touching the text zone on the LCD touch screen.



LCD Configuration

Idle Screen Status: ON

Video Play Brightness
35

Idle Screen Timeout
60 Seconds

Infinite Video Play: OFF

Video Play Duration
60 Seconds

Figure 151: Configuring Idle Screen Status

1. The administrator can set **Idle Screen Status** as ON or OFF.
2. Select status as ON if it is required to auto-lock the terminal when idle.
3. If an administrator select status as OFF, then subsequent parameters to set Video will be disabled, as shown in above screen

Recommendation: If network intensive or database intensive operations are performed on terminal, it can affect the response time of the terminal until this background operation is completed. Hence it is advisable to do such network or database intensive operation when terminal is in idle state.

Video Play Brightness Control

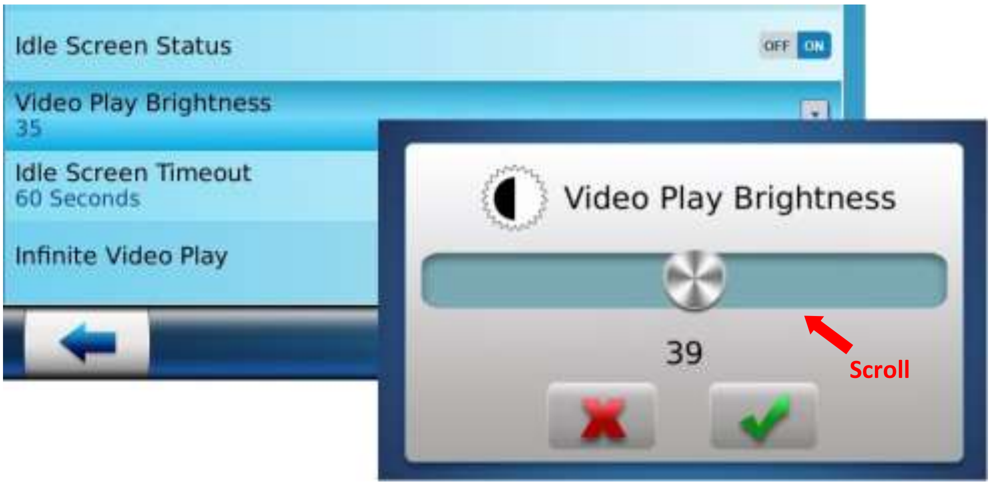
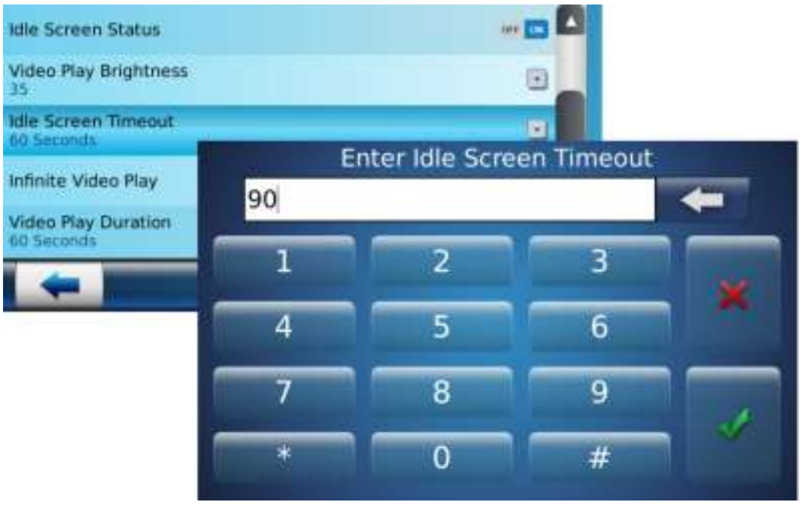


Figure 152: Video Play Brightness Control

1. Press on **Video Play Brightness**
2. In the next screen, the administrator can adjust the brightness of the video by scrolling the curser left or right
3. Move curser left to reduce brightness and right to increase brightness of the Video
4. Use "✓" icon to Save setting

Idle Screen Time Out



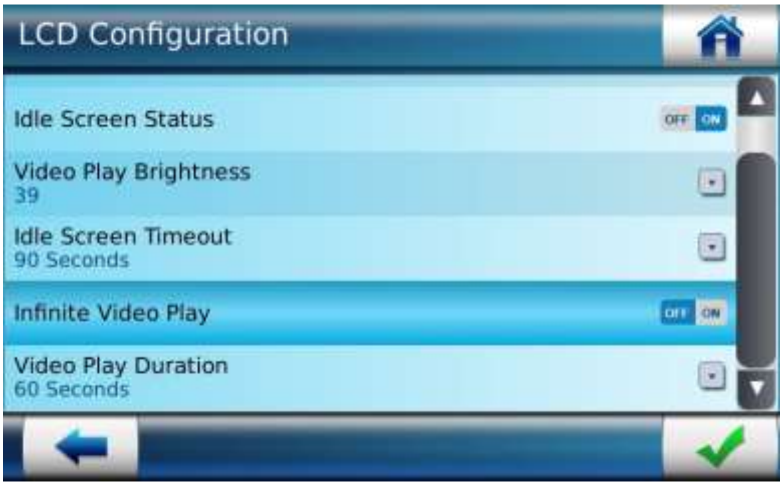
Idle Screen Status OFF ON
Video Play Brightness
35
Idle Screen Timeout
60 Seconds
Infinite Video Play
Video Play Duration
60 Seconds

Enter Idle Screen Timeout
90

Figure 153: Configuring Idle Screen Timeout

1. Idle Screen Timeout parameter indicates that if there is no action taken on LCD for specified duration, then screen should be auto-locked and video play starts
2. Press on Idle Screen Timeout parameter
3. On next screen enter duration (in seconds only)
4. Use "✓" icon to **Save** setting

Set Infinite Video Play



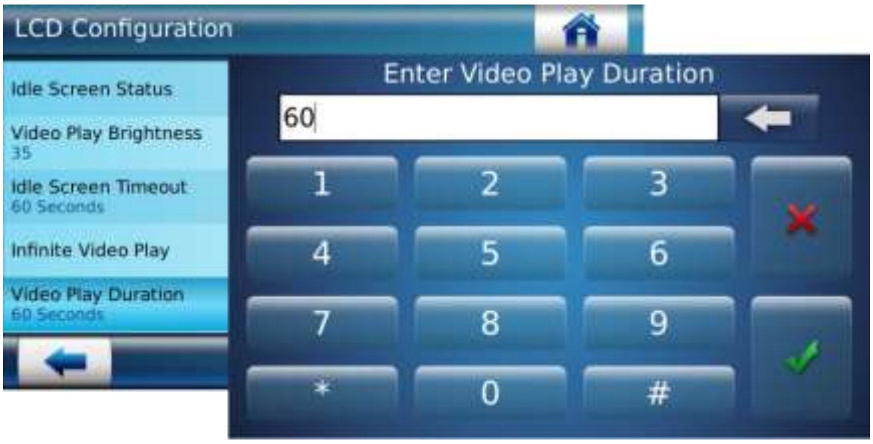
LCD Configuration

Idle Screen Status OFF ON
Video Play Brightness
39
Idle Screen Timeout
90 Seconds
Infinite Video Play OFF ON
Video Play Duration
60 Seconds

Figure 154: Infinite Video Play on idle screen

1. This parameter indicates whether the video needs to be played on idle screen for infinite duration or not.
2. Select **OFF** or **ON**
3. The administrator must define duration for which video is to be played, if the ‘Infinite video play’ is set to be OFF.

Video Play Duration



LCD Configuration

Idle Screen Status

Video Play Brightness
35

Idle Screen Timeout
60 Seconds

Infinite Video Play

Video Play Duration
60 Seconds

Enter Video Play Duration

60

Figure 155: Setting Video Play Duration

1. Press on **Video Play Duration** and enter the number of seconds it is required for the video to be played when terminal is idle
2. Use “✓” icon to **Save** setting
3. Use “✓” icon on LCD Configuration screen to **Save** all parameters

Results

Video will be played on the LCD screen as per the configuration done. Once the video play duration is completed, the video will be stopped, and terminal will go into Low Consumption Mode.

Video Phone Configuration

This feature allows user to make a video call from terminal to the customer care center for resolving any queries.

Video phone feature requires server configuration. Refer to “Configure Video Phone / Audio Phone Server” section of this document for more information on Video Phone feature.

Transaction Log

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal records each event taken place on a terminal. The events that can be logged are:

- Access granted to the user
- Access denied to the user
- Time and Attendance actions
- Configuration change
- Alarm
- Face detection captured and picture stored (SIGMA Family only)

NOTE: The events that user has cancelled are not logged

All events are recorded in a local file. The log created has various information fields, such as User ID, Name of User, Role of User; Time of trigger, Biometric Matching Score, etc.

In basic log mode, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal can store up to 100,000 transaction logs in the database, by default. However, the administrator can increase the capacity of storing logs in terminal database by installing "*Log licenses*".

The administrator has to export logs using Morpho Bio ToolBox, webserver or a USB mass storage device In order to view transaction logs. Refer to "*Export Data in USB Mass Storage Device*" under USB Menu Section.

The administrator needs to refer to the subsequent sections in order to understand the parameters that can be configured in the 'Transaction Log'. The administrator who has full Admin Rights to access terminal can able to configure these parameters.

NOTE: We recommend to regularly retrieve and erase transaction logs. Keep too many logs inside the terminal could make it slow down.

Configure Transaction Logging Mode

The administrator can chose as to which event will be logged:

- **No Log:** An administrator can set Transaction Logging to 'No Log' mode. This indicates that no actions will be recorded and stored on terminal
- **Access Control Log:** This mode indicates that only user access request pass and fail should be recorded and stored
- **Full Log:** This mode indicates that all the events taken place on terminal including configurations done, time and attendance actions, errors, etc. are captured and stored in terminal.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Transaction log > Transaction Logging	✓	✗
Webserver	Webserver > Logs	✓	✓

Screens & Steps

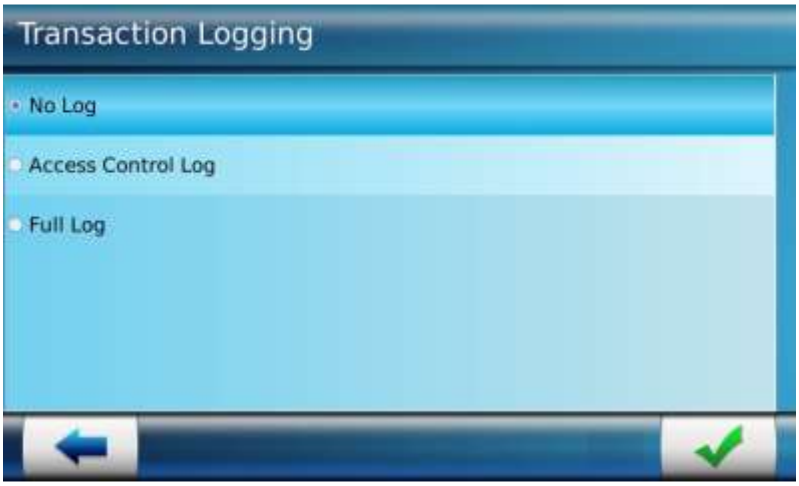


Figure 156: Selecting Transaction Logging Mode

1. Select **Transaction Logging Mode** as 'No Log', 'Access Control Log' or 'Full Log'

2. Press on “✓” button to save settings

Results

As per the selected mode of logging, transaction logs are created by terminal. In case terminal fails to store log parameter, an error message is displayed.

Define Actions on Log Full Event

The administrator can select the action to perform when there is no room for a new log record, by using this functionality:

- Delete Partial Logs
- Delete Full Logs

Based on this configuration, terminal will delete logs entirely or partially, when log full event occurs.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Transaction log > Actions on Log Full Event	✓	✗
Webserver	Logs > Action on Transaction Log Full	✓	✓

Screens & Steps

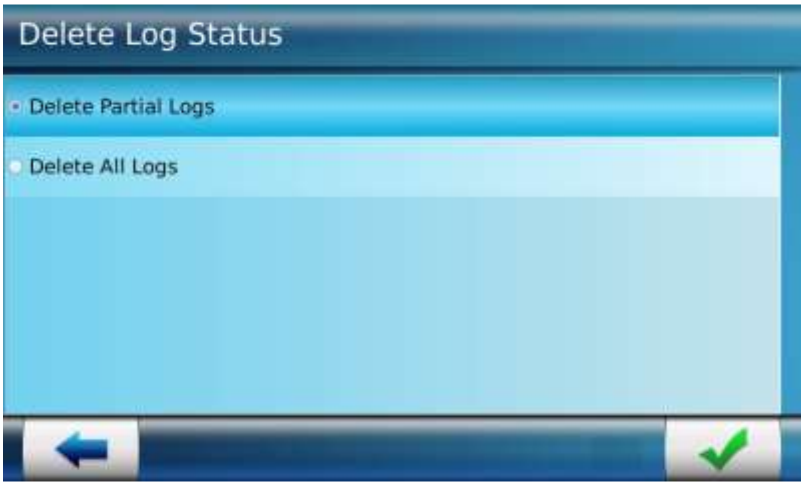


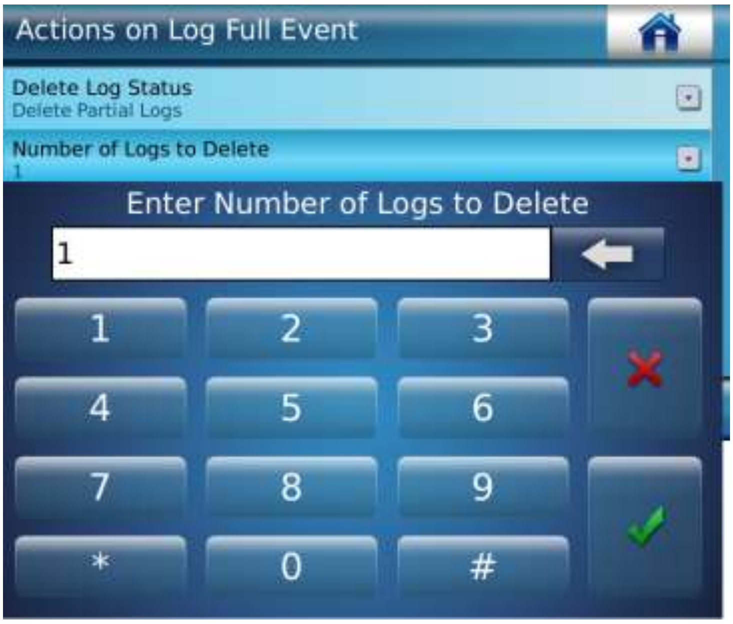
Figure 157: Setting Delete Log Status

1. Select **Delete Log Status** as:

   a. **Delete Partial Logs**, if specific number of logs to be deleted on delete log action triggered

   b. **Delete All Logs**, if all logs stored in database should be deleted on delete log action triggered

2. Press on “✓” button to save settings



Delete Log Status
Delete Partial Logs

Number of Logs to Delete
1

Figure 158: Defining number of logs to be deleted

3. The administrator needs to define **Number of Logs to be Deleted** when delete action is triggered and Delete Partial Logs is set to be ON.

4. Press on “✓” button to save settings

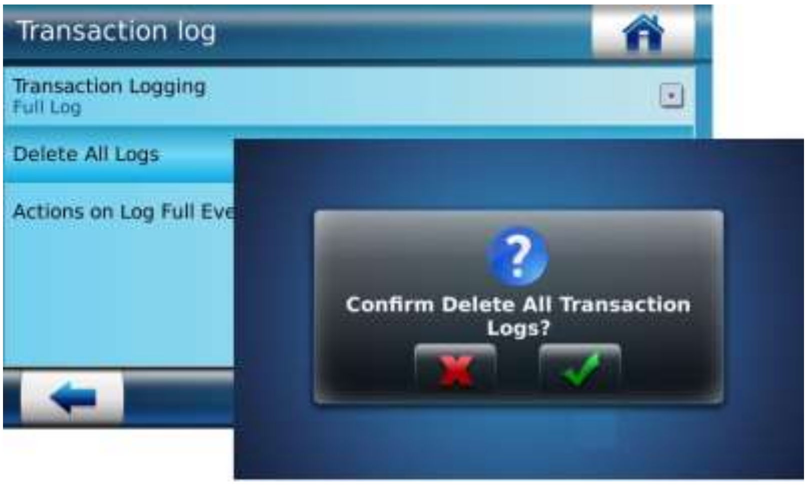
Delete Transaction Logs

The administrator can delete all transaction logs recorded and stored in terminal database, by using this functionality.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu >Transaction log > Delete All Logs	✓	✗
Webserver	Logs > Transaction Log > Delete All Transaction Logs	✓	✓

Screens & Steps



Confirm Delete All Transaction Logs?

Figure 159: Deleting Transaction logs

1. Press on **Delete All Logs**
2. A confirmation message will pop-up to confirm an action to delete all transaction logs
3. Press on "✓" button to delete. If this is not intended the administrator can Press on "✗" button to cancel

Results

A success message is displayed. Transaction Logs are deleted from the database.

Miscellaneous Settings

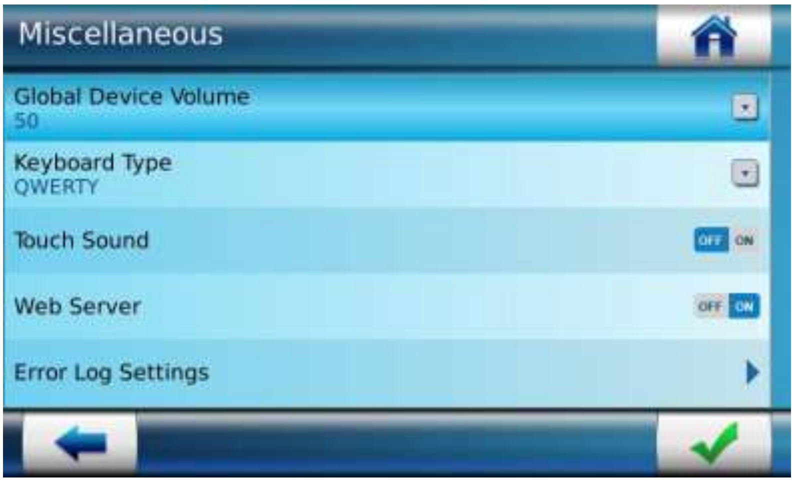
Global Device Volume

The administrator can set volume of all the audio/video files that are uploaded in the terminal by using Global Terminal Volume.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Miscellaneous Settings	✓	✗
Webserver	MMI > Audio Volume	✓	✗

Screens & Steps



Miscellaneous

Global Device Volume
50

Keyboard Type
QWERTY

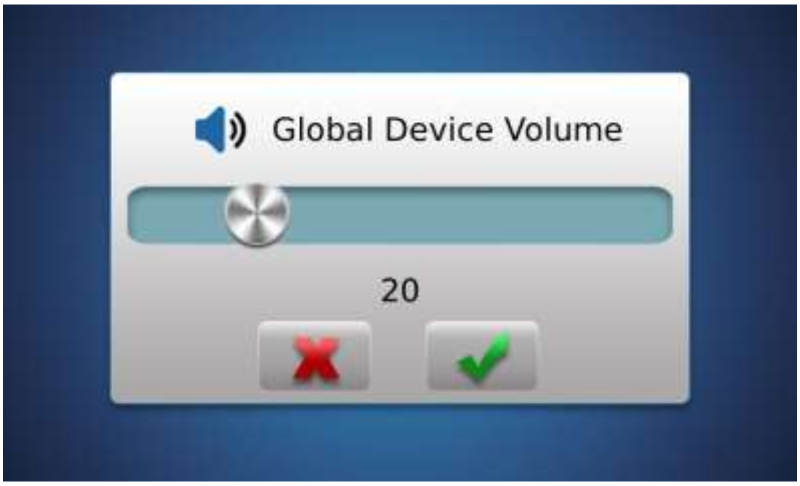
Touch Sound — OFF ON

Web Server — OFF ON

Error Log Settings

Figure 160: Terminal Global Volume

1. Select **Global Device Volume**



Global Device Volume

20

Figure 161: Set Global Device Volume

2. Scroll the radio button to right side for increasing the volume and scroll towards left to decrease the volume
3. Press on check button to save settings

Results

Sound will be played as per the configured Global Terminal Volume.

References

- Refer to “*Multimedia menu*” to know how to upload audio/video files to terminal

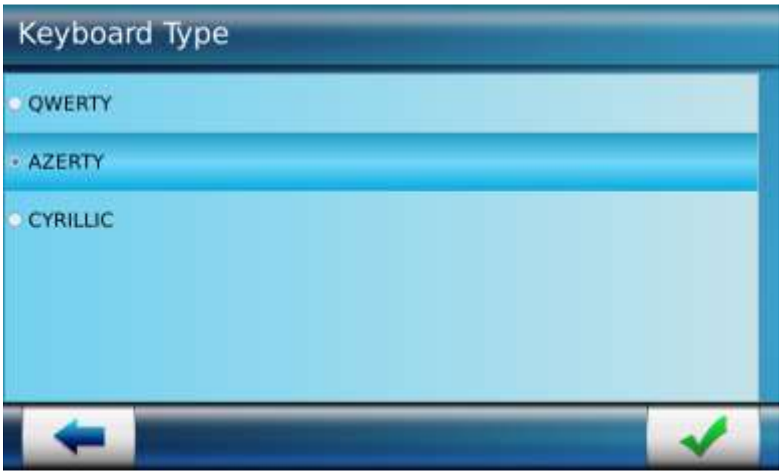
Select Keyboard Type

The administrator can select keyboard type, by using this functionality. The default keyboard in MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is QWERTY (English standard keyboard).

Access Path

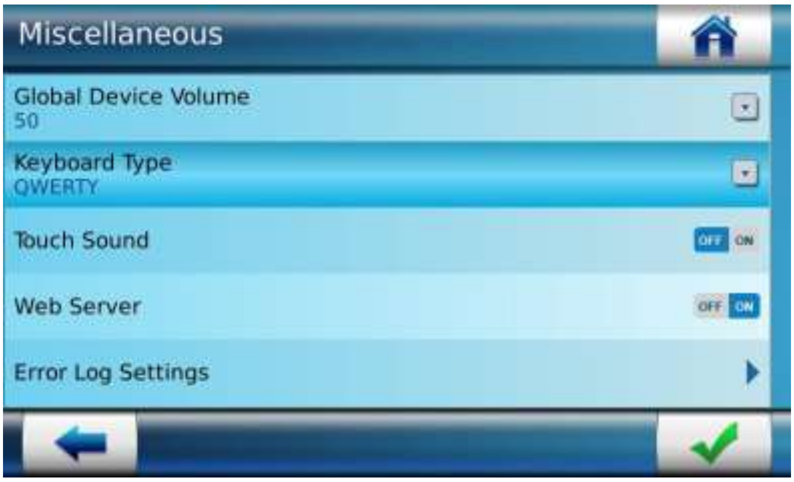
Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Miscellaneous Settings	✓	✗

Screens & Steps


Keyboard Type

○ QWERTY
● AZERTY
○ CYRILLIC

Figure 162: Selection of Keyboard Type


Miscellaneous

Global Device Volume
50

Keyboard Type
QWERTY

Touch Sound OFF ON

Web Server OFF ON

Error Log Settings

Figure 163: View of of AZERTY Keyboard selection

2. Select Keyboard type & select **AZERTY keyboard** from the drop down list. Following snapshot depicts the **AZERTY keyboard**:

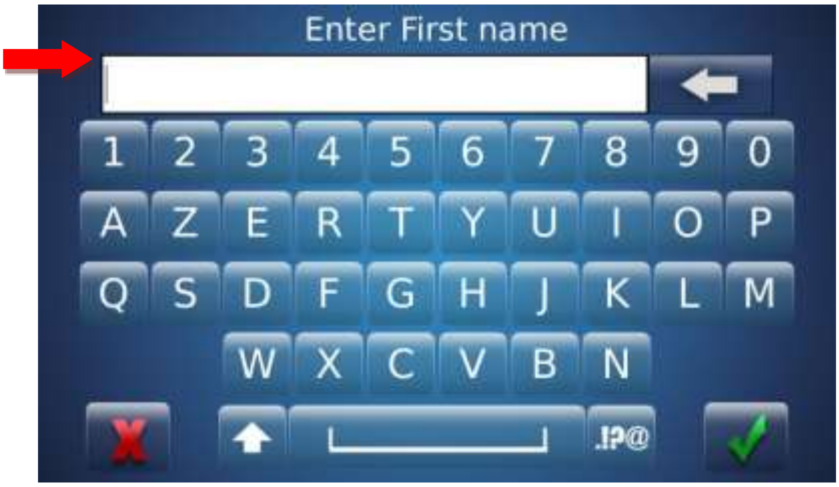


Figure 164: AZERTY keypad

3. The Cyrillic keyboard is available in following screens for entering First Name & Last Name.
   a. Menu -> User Menu -> Add/Enroll User -> DB Only
   b. Menu -> User Menu -> Edit User
   c. Menu -> User Menu -> Delete User -> Delete User
   d. Menu -> User Menu -> Card Manager -> Renew User Card

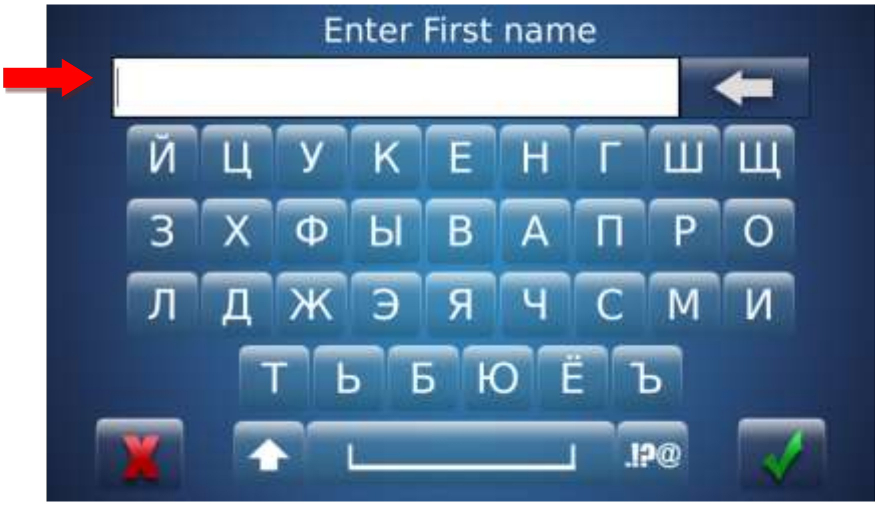


Figure 165: CYRILLIC keypad

Touch Sound

The administrator can configure a Touch Sound. If enabled, a beep sound will be played on every keypress. By default the Touch Sound is disabled in a MorphoAccess® SIGMA Family Series terminals.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series	SIGMA Lite Series *MorphoWave®* Compact	SIGMA Lite+ Series
Terminal Menu	System Menu > Terminal Settings > LCD Configuration	✓	✗	✗
Webserver	Webserver > MMI	✓	✗	✓

Screens & Steps

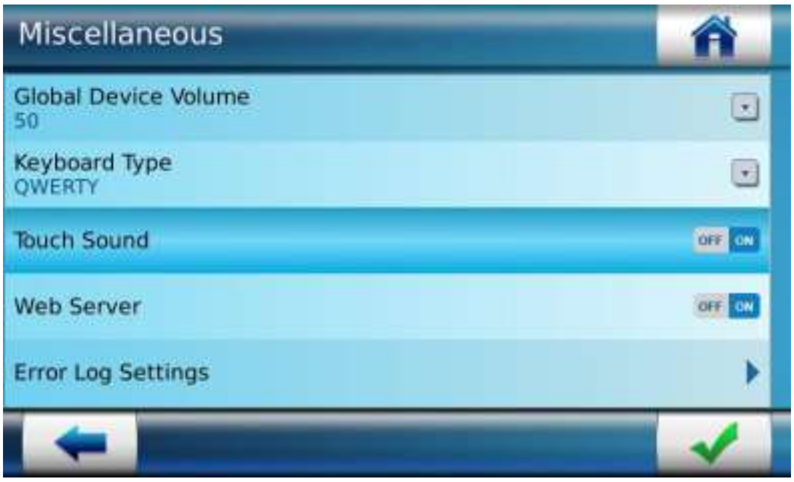


Figure 166: Touch Sound

Web Server

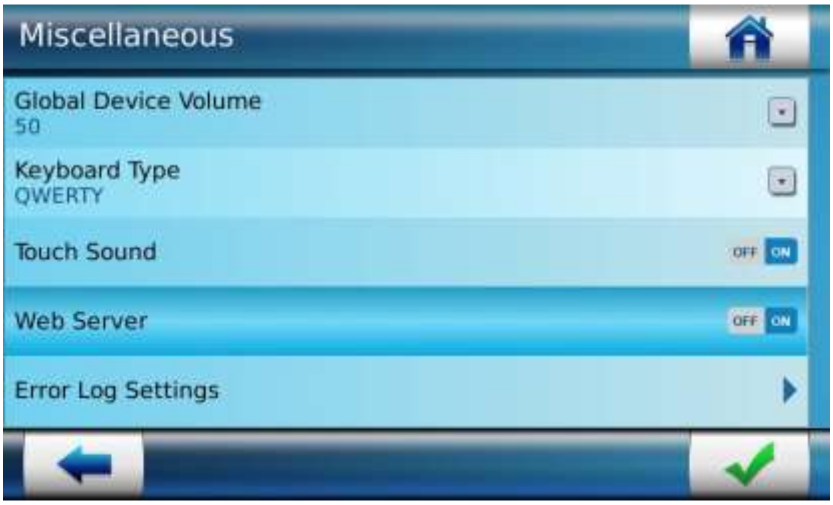
The administrator can access the Web Server on MorphoAccess® SIGMA Family Series and Morpho*Wave*® Compact terminals. Web Server allows an administrator to configure any parameter of the terminal by connecting remotely. Please refer the "*Access to Administration Menu through Webserver*" in this document.

By default the access to Web Server is disabled in a MorphoAccess® SIGMA, SIGMA Extreme Series and Morpho*Wave*® Compact terminals and enabled in MorphoAccess® SIGMA Lite Series terminal.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Miscellaneous Settings > Web Server	✓	✗

Screens & Steps



Miscellaneous

Global Device Volume
50

Keyboard Type
QWERTY

Touch Sound OFF ON

Web Server OFF ON

Error Log Settings

Figure 167: Web Server

1. If the administrator selects **Web Server** as ON, then the terminal can be configured from a remote machine.

Error Log Configuration

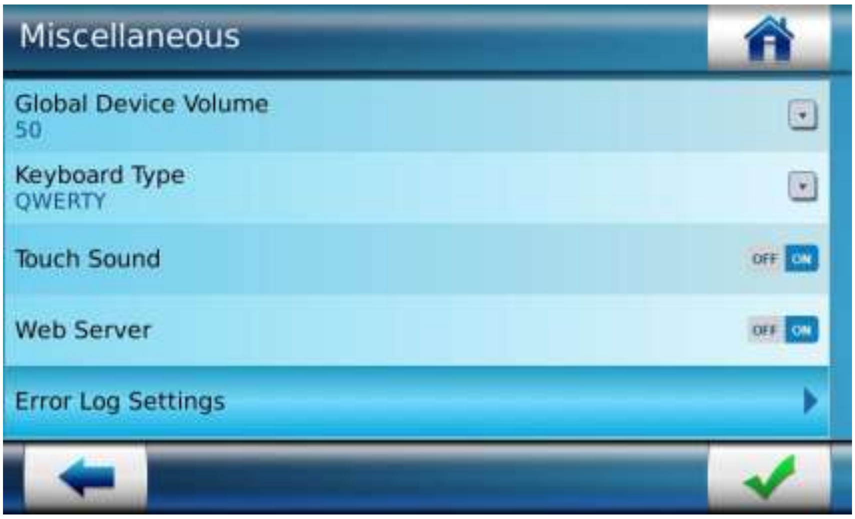
MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminals are capable of capturing logs of the events when access is denied or any error has occurred during operations.

The administrator can enable/disable error logging and configure related parameters, using 'Error log Configuration' feature.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Miscellaneous Settings > Error Log Configuration	✓	✗
Webserver	Logs > Error Log > Error Logging	✓	✓

Screens & Steps


Miscellaneous

Global Device Volume
50

Keyboard Type
QWERTY

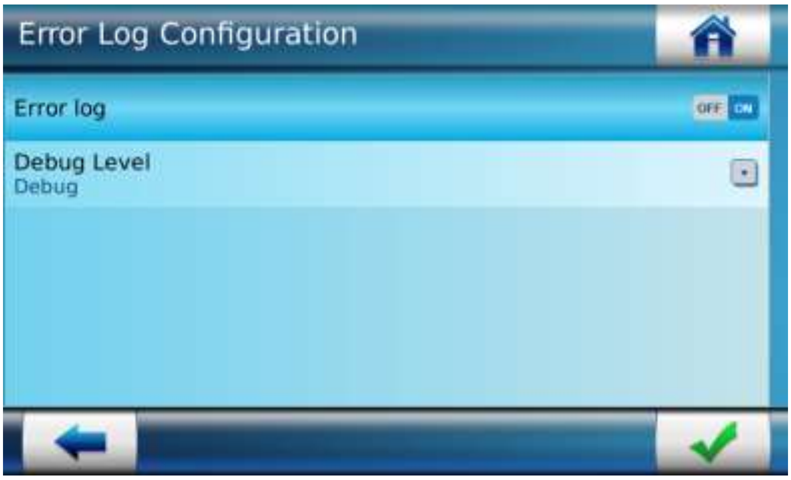
Touch Sound OFF ON

Web Server OFF ON

Error Log Settings

Figure 168: Select Error Log Configuration

2. Select **Error Log Configuration**



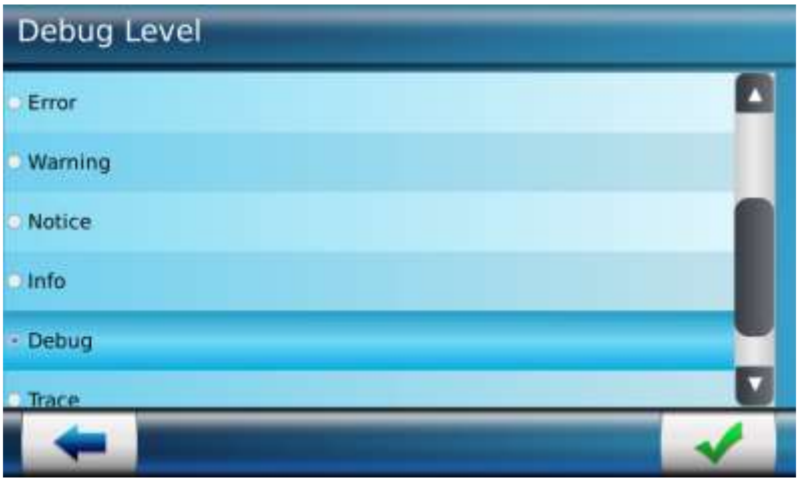
Error Log Configuration

Error log OFF ON

Debug Level
Debug

Figure 169: Enable Error Logging

3. Select **Error Log** as ON, to enable error logging.



Debug Level

Figure 170: Setting Error Log Debug Level

4. Select **Debug Level** from the available list
    a. Fatal
    b. Alert
    c. Critical
    d. Error
    e. WARNING
    f. Notice
    g. Info
    h. Debug

i. Trace

NOTE: If the administrator selects **Debug Level** as WARNING, then all the messages of the Error, Fatal, Alert and Critical category, will be logged. Messages in the ‘Notice’, ’Info’ , ‘Debug’ and ‘Trace’ category will not be displayed.

5. Press on “✓” button to save settings

Results

The Error logs are captured and stored on the terminal. The administrator can use the Export functionality under USB menu, to export the logs. Refer to “*Export Data in USB Mass Storage Device*”.

Sensor Log Configuration

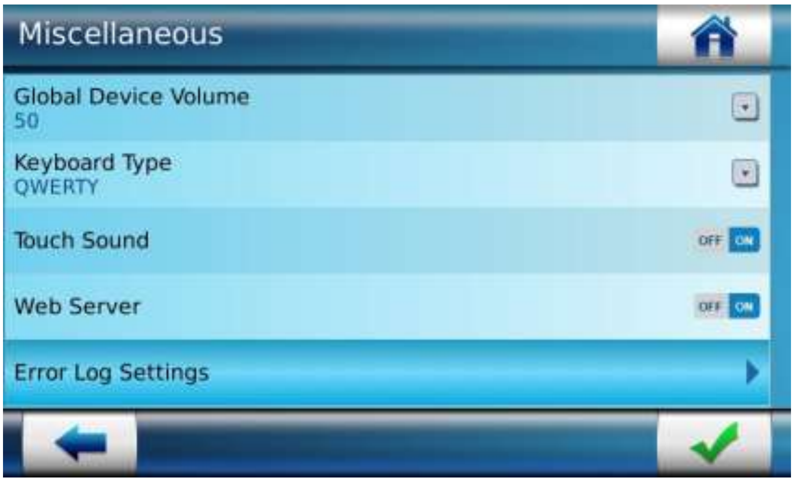
MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminals are capable of capturing logs of the CBI sensor when any operation is performed on CBI sensor

The administrator can enable/disable sensor logging, and configure related parameters, by using Sensor log configuration feature.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Miscellaneous Settings > Sensor Log Configuration	✓	✗

Screens & Steps



Miscellaneous

Global Device Volume
50

Keyboard Type
QWERTY

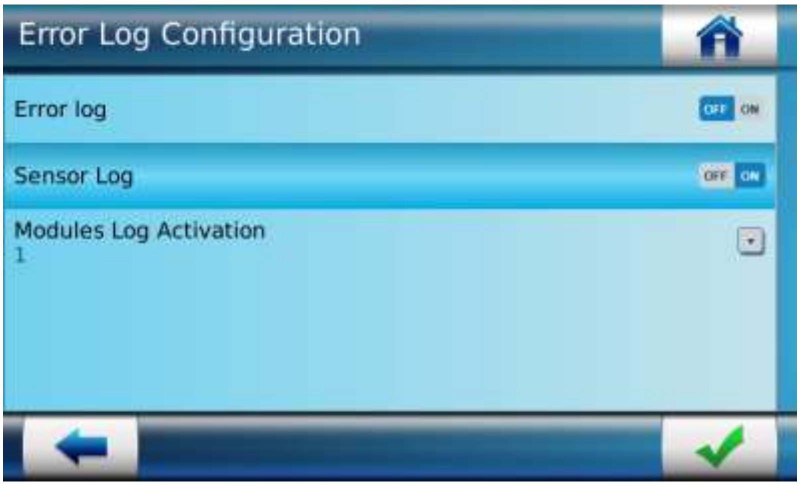
Touch Sound OFF ON

Web Server OFF ON

Error Log Settings

Figure 171: Select Error Log Configuration

1. Select **Error Log Configuration**



Error Log Configuration

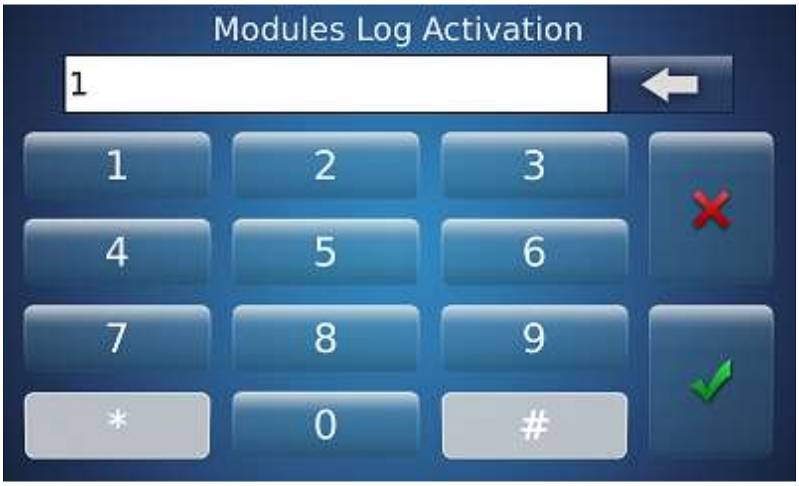
Error log OFF ON

Sensor Log OFF ON

Modules Log Activation
1

Figure 172: Enable Error Logging

2. Select **Sensor Log** as ON, to enable sensor logging.



Modules Log Activation

1

Figure 173: Sensor Modules Log Activation

3. Set **Module Log Activation** value in-between 0 to 65535

> **NOTE:** The sensor logs of modules WRAPPER, SDK, IHM, SCFG, LOG, SETTING_SENSOR, IMG_PROCESSING, FFD, DTPR, ACQ_MGR, LIBBIO, BIODB, SRV, PARAM, PAL Modules based on the value set in Module Log Activation will be included in the Error Log File. For example, if an administrator set the value 57343 in Module Log Activation, then the Error Log file will consist the sensor logs of modules WRAPPER, IHM, SCFG, LOG, SETTING_SENSOR, IMG_PROCESSING, FFD, DTPR, ACQ_MGR, LIBBIO, BIODB, SRV, PARAM, PAL and will not consist log of SDK module.

4. Press on check button to save settings

Communication menu

MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminals are standalone terminals, it means the configuration and operations are performed without any connection to a host application. However, MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals are required to communicate with distant applications such as door controller, access controller or hosted application like Webserver. Communication with distant systems can be done to perform the following functions:

- Connect to Central Access Controller in order to grant or deny the access to the user across multiple locations.
- Terminal configuration
- Terminal maintenance: firmware upgrade, add a license (to unlock an optional feature)
- Database management: add, modify or remove a user
- Log file management: get or delete log file
- Configuring the Wi-Fi™ connection.

There are several communication channels which can be used to connect with distant systems like through Ethernet channel, Wi-Fi™ network, 3G/GPRS network or Serial channel. Refer section "

Connecting the Terminal to a PC" to understand in detail.

The administrator can configure network parameters to enable communication with distant systems, using Communication Menu. Only an administrator with Full Admin Rights can access this menu.

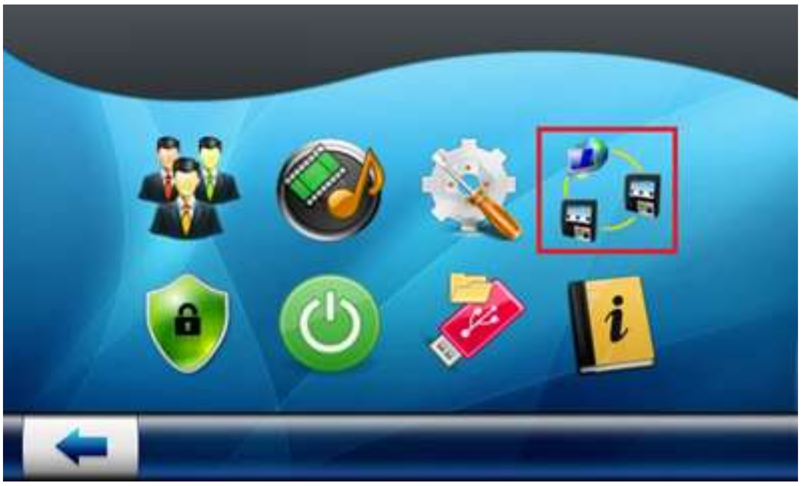


Figure 174: Communication Menu

Security recommendation

It is recommended to disable unused communication channels to avoid security issues, however ensure to let at least one way to configure the terminal.

Ethernet Network Configuration

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal can be connected to devices (such as central access controller, and door controller) via **Ethernet.** The administrator can configure an IP Mode, which can be static or DHCP (dynamic). This can be done via 'Ethernet' in the 'Network Configuration' depicted below. For more information on Ethernet Configuration, please refer to "*Ethernet Interface Settings*" under FBA.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Communication Menu > Network Interface > Ethernet	✓	✗
Webserver	Terminal Settings > Communication	✓	✓

Screens & Steps

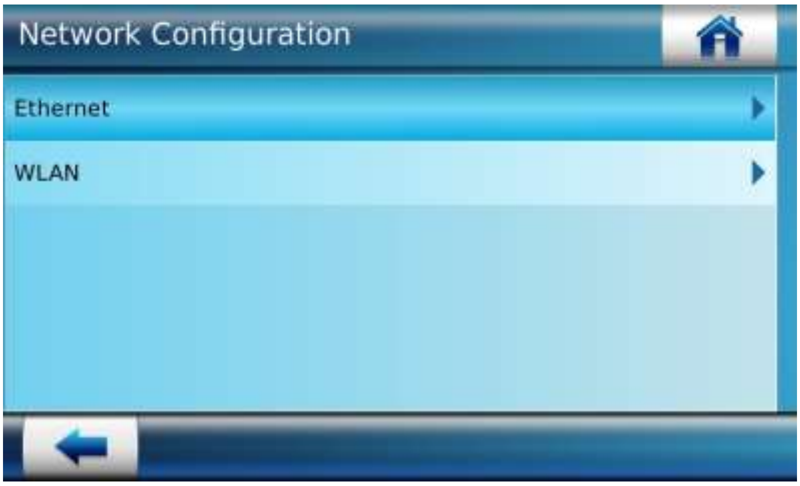


Figure 175: Selecting Ethernet-Network Configuration

6. Select **Ethernet**
7. Select **IP Configuration**

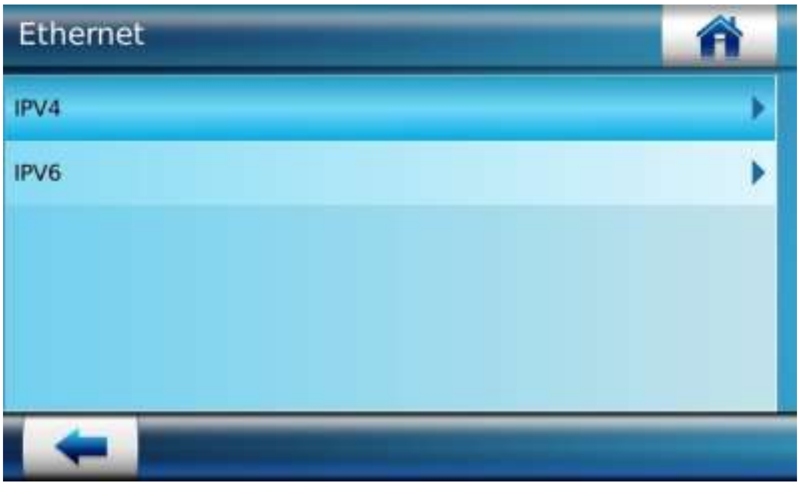


Figure 176: Ethernet Configuration

8. Under Ethernet tab, the administrator can select **IPV4** or **IPV6**
9. On next screen, default IP Mode is selected as static. Press on **IP Mode** for update

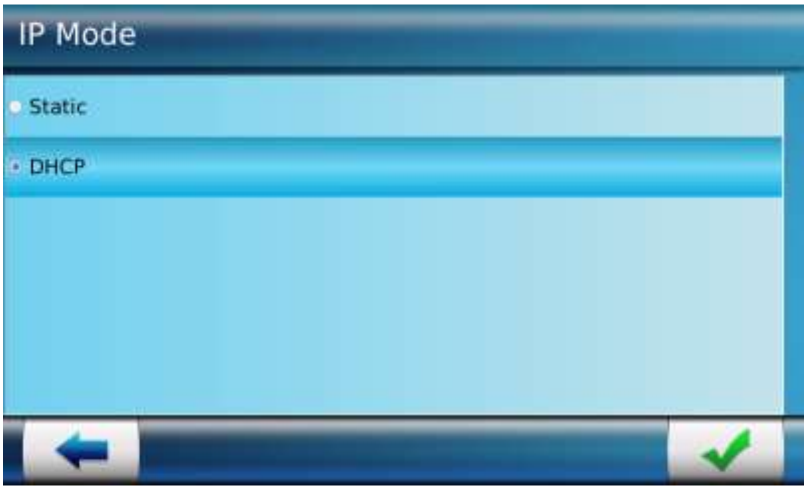
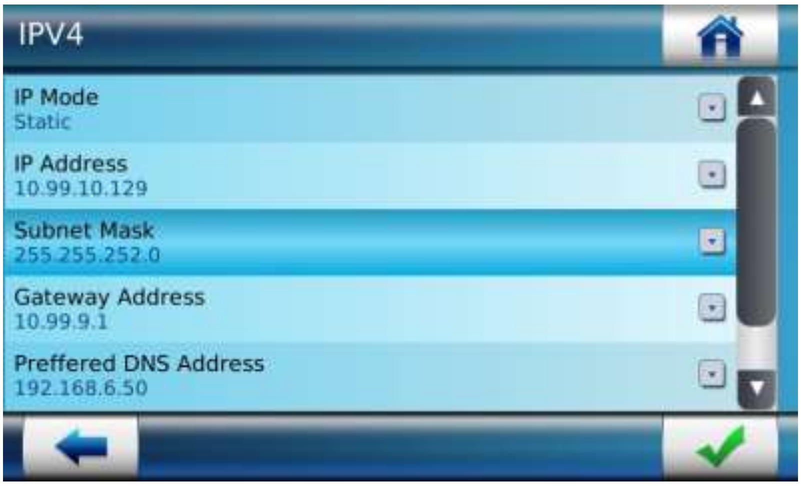


Figure 177: IP Mode Selection

10. An administrator can select **IP Mode** as ‘Static’ or ‘DHCP’

11. Use Check button “✓” to save the setting



IP Mode
Static

IP Address
10.99.10.129

Subnet Mask
255.255.252.0

Gateway Address
10.99.9.1

Preffered DNS Address
192.168.6.50

Figure 178: Configuring IP Address under Static IP Mode

12. The administrator can manually configure ‘IP Address’ of the terminal, ‘Subnet Mask’, 'Network Mask', 'Gateway Address' and 'DNS Servers under the Static IP Mode.

Results

Once the Ethernet Configuration is done, the terminal can be connected to a distant server. An administrator can also configure parameters to prevent unauthorized access to the terminal. These settings can be done from Security menu, refer “*Network & Communication Security Settings*”.

Wi-Fi™ Network Configuration

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal can be connected to devices (such as central access controller and door controller) via **WLAN (Wi-Fi™ network).** The terminal needs the Wi-Fi™ connection to make operations such as requesting access to the access controller and receiving the result message.

At First Boot Assistant, an administrator can configure the terminal to communicate through WLAN. For detailed description, please refer to “*Wi-Fi Network Configuration*.

Mobile Network Configuration

MorphoAccess® SIGMA Family terminals can be connected to devices (such as central access controller and door controller) via **Mobile Network.** Using Mobile Network connection, the terminal can make access request to the access controller and receive result message.

The administrator can configure parameters to communicate through Mobile Network from terminal.

NOTE: The Administrator needs to contact mobile network provider for the settings for their network.

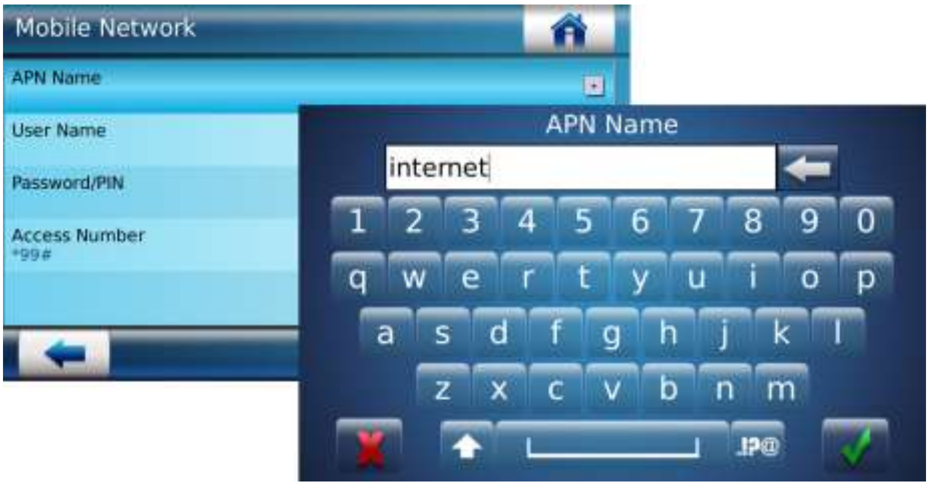
Access Path

Access point	Access Path	SIGMA Series	SIGMA Extreme Series SIGMA Lite Series MorphoWave® Compact
Terminal Menu	Communication Menu > Network Interface > Mobile Network	✓	✗

Pre-requisites

- 3G USB modem must be plugged into the terminal
- MA_3G license must be installed on terminal

Screens & Steps



APN Name: internet

Figure 179: Enter APN

1. Enter APN Name. Press on "✓" button to set.

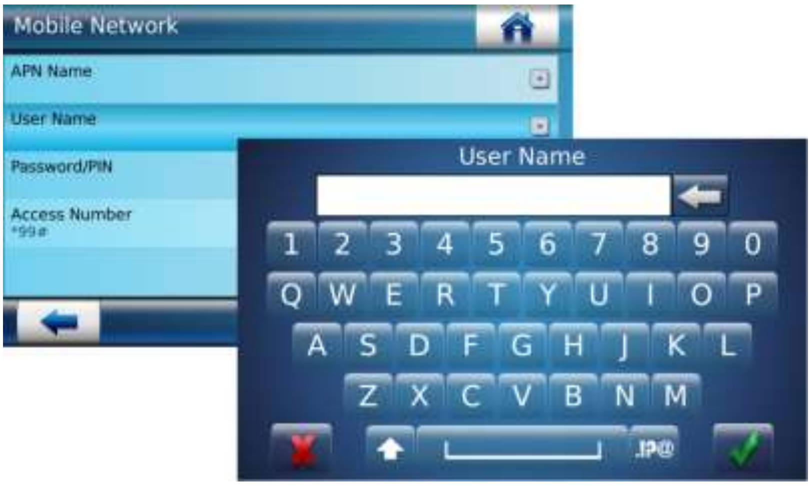
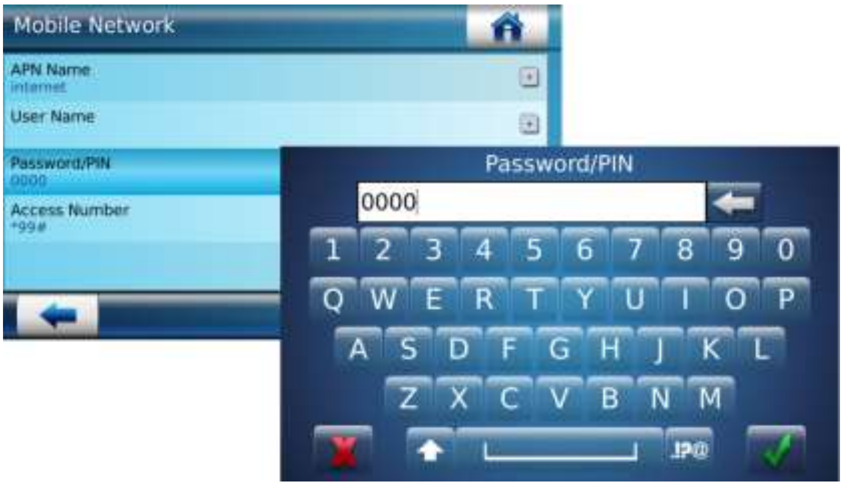


Figure 180: Enter User Name

2. Enter User Name. Press on "✓" button to set.



Mobile Network

APN Name
internet

User Name

Password/PIN
0000

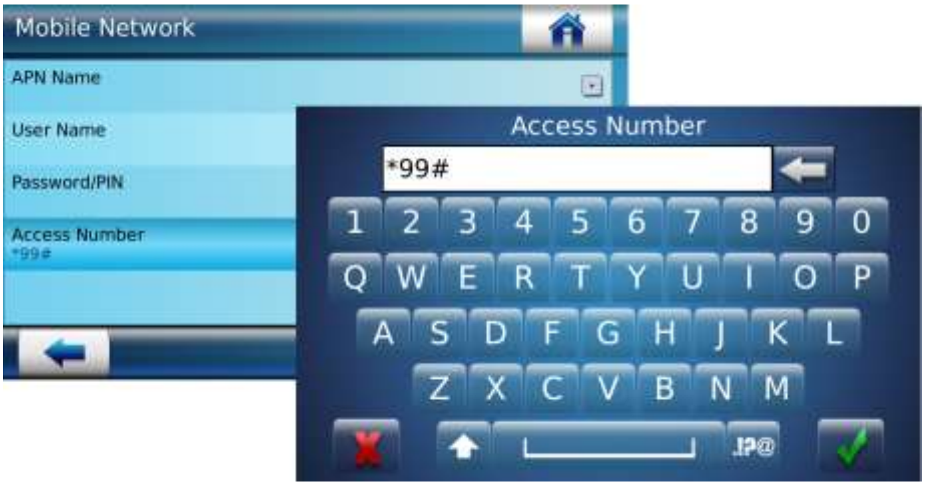
Access Number
*99#

Password/PIN

0000

Figure 181: Enter Password / PIN

3. Enter Password / PIN. Press on "✓" button to set.



Mobile Network

APN Name

User Name

Password/PIN

Access Number
*99#

Access Number

*99#

Figure 182: Enter Access Number

4. Enter Access Number. Press on "✓" button to set.
5. Press on "✓" button to save all setting on Mobile Network parameter menu.

Configure Hostname

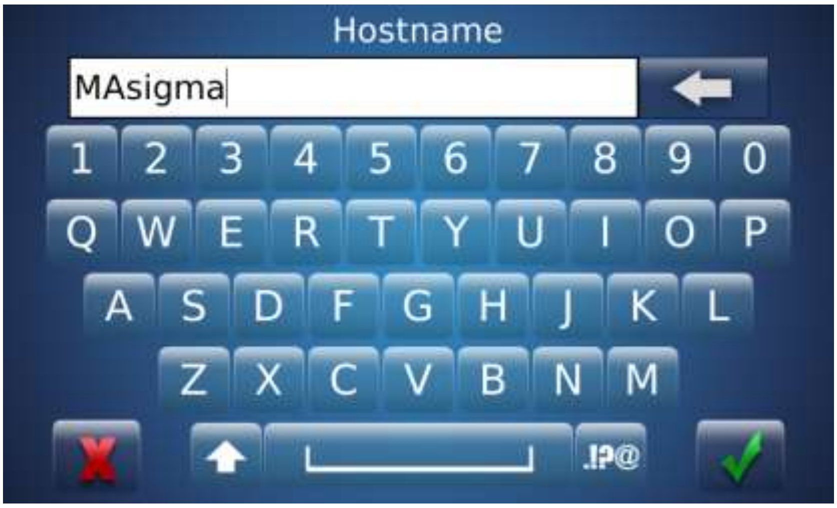
The administrator can configure the Hostname when the IP Mode is selected as DHCP.

The host name is used instead of the IP address, when a DNS (Domain Name Server) exists in the network.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Communication Menu > Network Interface > Hostname	✓	✗
Webserver	Terminal Settings > Communication > IPv4 Network	✓	✓

Screens & Steps


Hostname

MAsigma

Figure 183: Configuring Hostname

1. Enter the Hostname, by using the keyboard on terminal
2. Use Check button "✓" to save the setting

Serial Parameters

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to communicate with external controller using Serial Port, through RS422 or RS485 protocols. When terminal is communicating (i.e. receiving inputs and sending outputs) through RS422, it will not be able to communicate through RS485, and vice versa.

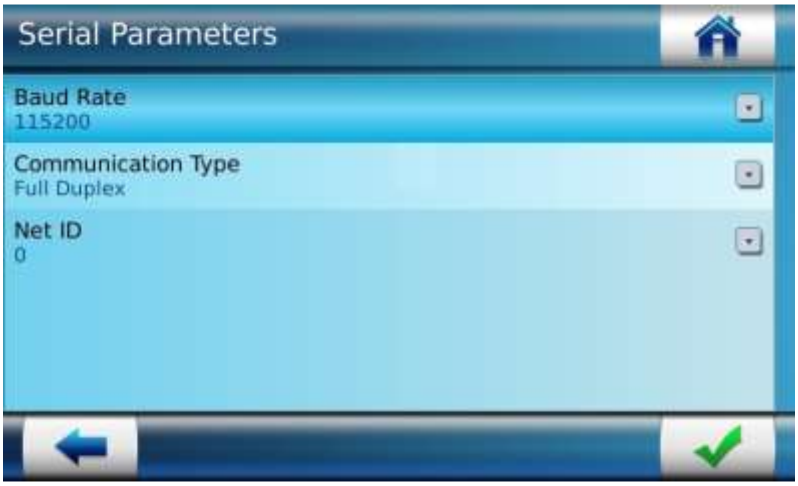
Serial channel is also used for sending distant commands to terminal. The administrator can configure parameters of the serial channel from terminal or via Webserver interface.

NOTE: Webserver application cannot use the Serial channel for configuring the terminal

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Communication Menu > Serial Parameters	✓	✗
Webserver	Terminal Settings > Communication > Serial Configuration	✓	✓

Screens & Steps



Serial Parameters

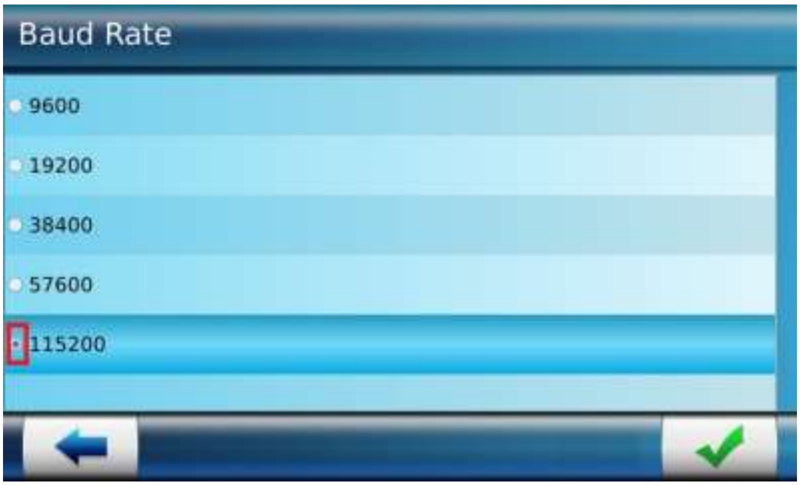
Baud Rate
115200

Communication Type
Full Duplex

Net ID
0

Figure 184: Defining Baud Rate

1. Select **Baud Rate**. Baud rate is the rate of message transmission from MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal to distant system using serial channel



Baud Rate

○ 9600

○ 19200

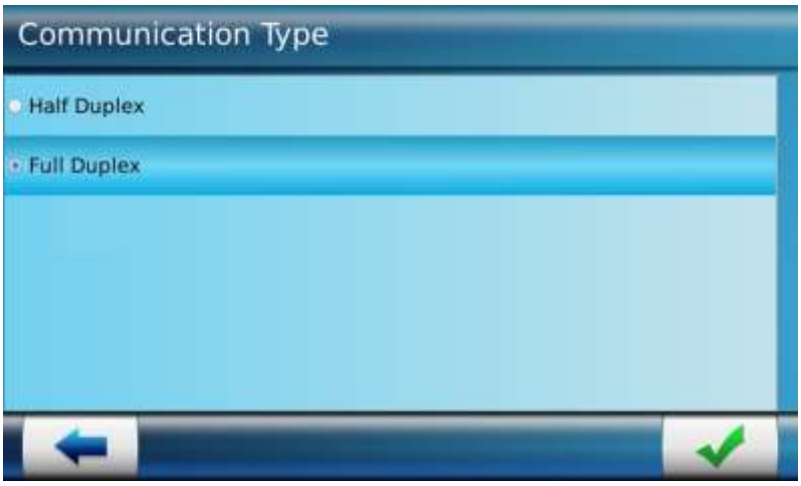
○ 38400

○ 57600

● 115200

Figure 185: Select Baud Rate

2. The list of supported Baud Rates is displayed. Select the required **Baud Rate**
3. Use Check button "✓" to save



Communication Type

○ Half Duplex

● Full Duplex

Figure 186: Selecting Communication Type

4. Select **Communication Type** as 'Half Duplex' or 'Full Duplex'
5. Use Check button "✓" to save

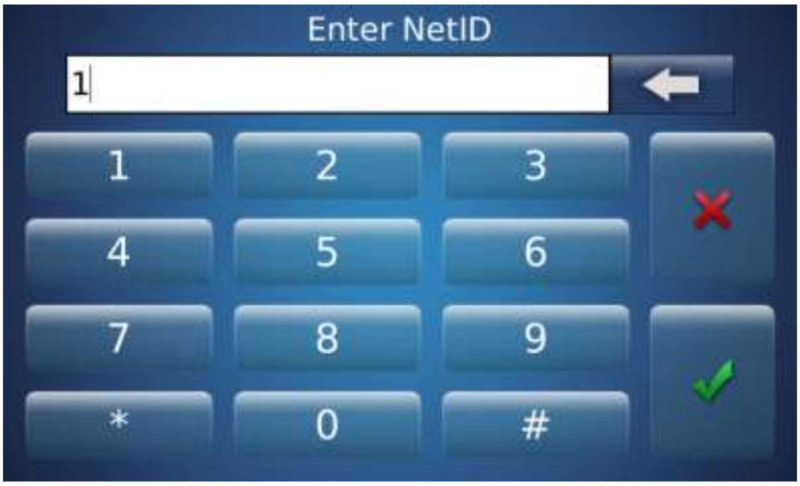


Figure 187: Enter Net ID

6. Enter a **Net ID** (will be used to identify the terminal in a RS485 network connection)
7. Press on "✓" button to save
8. Use Check button "✓" on Serial Parameters screen to save all settings

Results

The serial channel parameters are configured successfully. Terminal can communicate with distant systems using serial channel.

Security Menu

The administrator can configure security parameters to guard the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal against unauthorized access, by means of the Security Menu. Security menu deals with Biometric control, Network security, multi-user verification, LCD Login Password and User Control.

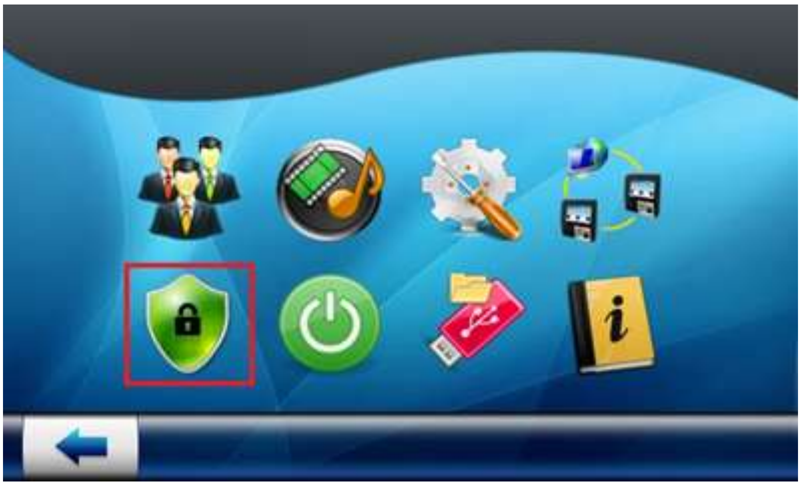


Figure 188: Security Menu

User Control Settings

Configure Trigger Events

The administrator can configure as to which of the following events trigger the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal. The terminal when triggered, begins the identification and authentication process.

- **Biometric**, a finger is detected on the biometric sensor, this starts the biometric identification process)
- **Contactless card**, detection of a contactless card, this starts the authentication process with user's data read on the contactless card.
- **Keypad**, detection of a user id entered with touch screen keypad. The entered User ID serves as references for authentication.
- **External Port**, reception of a User ID from Wiegand / Clock and Data port. The received User ID serves as references for authentication.
- **QR code,** a QR code is detected and the authentication process starts with the User ID parsed from the QR code

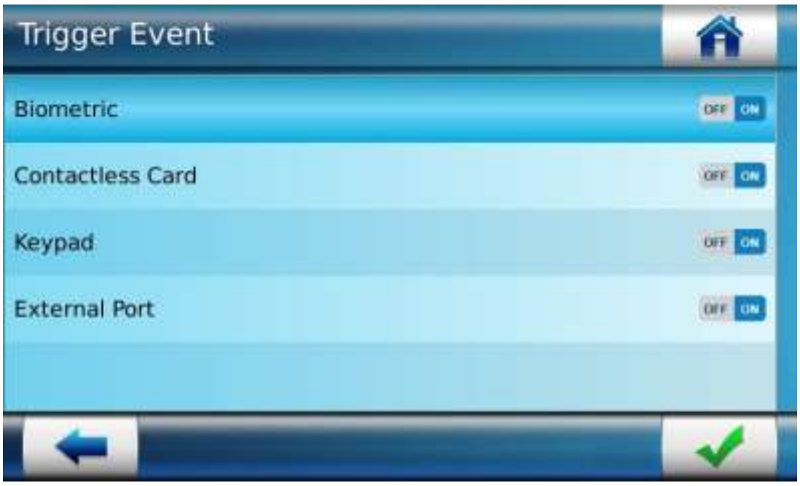
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > Trigger Event	✓	✗
Webserver	Control Configurations > User Control	✓	✓

Pre-requisites

- Only an administrator with full administrative or database administrative rights, can configure Biometric Security Parameters

Screens & Steps



Trigger Event

Biometric OFF ON

Contactless Card OFF ON

Keypad OFF ON

External Port OFF ON

Figure 189: Configuring the events on which authentication/identification is triggered

1. Select the events listed in the trigger event screen (above) as **ON** or **OFF**
2. Use Check button "✓" to save settings

Set Duress Mode

The administrator can enable Duress Mode in MorphoAccess® SIGMA Family by using this parameter. The administrator can allow capturing of a user's duress finger in addition to two normal fingers, by setting the Duress Mode. Duress Mode is not available in *MorphoWave®* Compact.

On detection of a Duress finger, the terminal will send a "Duress Finger Event" to the controller using a communication channel such as IP channels, Wiegand, Clock and Data, RS485/RS422 or TTL outputs.

MMI is played when the Duress finger is successfully authenticated. An MMI for duress finger event is similar to normal finger event on access granted. Refer to "

Audio Settings” for more information about MMI configuration.

Duress Finger Event is logged in transaction logs with action ‘Duress Finger detected’ on successful identification and action ‘VERIFY_DURESS_ID / VERIFY_DURESS_TEMPLATE’ on successful authentication. Refer to “*How to Export & View Transaction Logs*” section for more information on exporting and viewing transaction log.

Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series	MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > Set Duress Mode	✓	✗	✗
Webserver	Control Configurations > User Control	✓	✗	✓

Screens & Steps

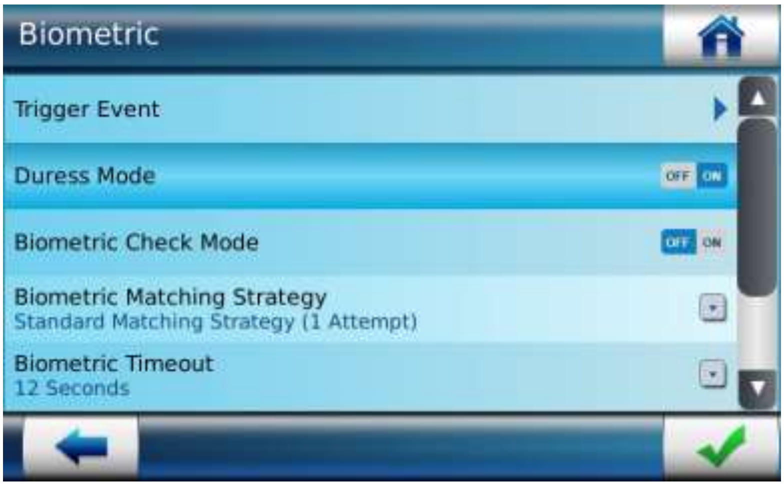


Figure 190: Set Duress Mode

1. An administrator can set **Duress Mode** as ON or OFF. Only if the Duress Mode is on, the terminal will ask for capturing duress finger at the time of enrolment.
2. Use Check button “✓” to save settings

Biometric Check Mode

If the administrator sets this mode as ON, the biometric data of the finger placed on the sensor is compared with the corresponding one that is stored in the terminal database (identification) or in the card of the user (authentication).

The administrator can set **Biometric Check Mode** as ON or OFF. However it is a 'must' to have user's biometric data in the terminal database or in user's card, if this mode is ON.

If the biometric check mode is OFF, then terminal will not ask user to place finger on the biometric sensor. Instead user can be authenticated using Card and Keypad modes.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > Identification	✓	✗
Webserver	Control Configuration > User Control > Finger Biometric authentication rule	✓	✓

Screens & Steps

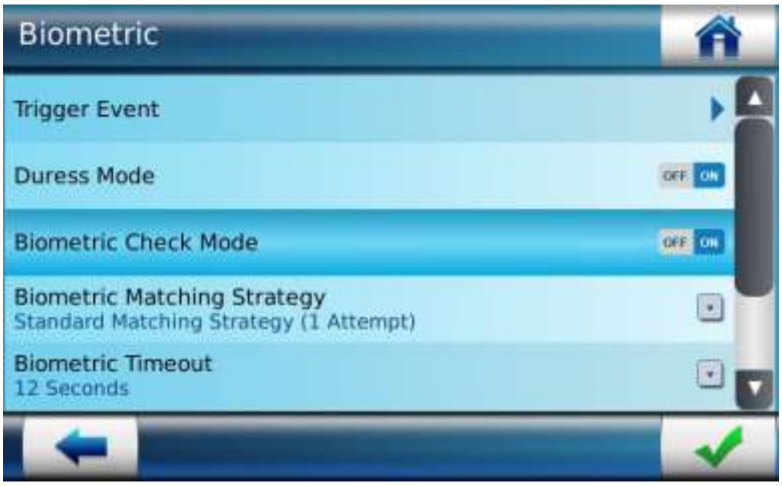


Figure 191: Setting Biometric Check Mode

1. Set **Biometric Check Mode** as OFF or ON.

2. Use Check button “✓” to save settings

Number of Biometric Check Attempt

The administrator can configure the Biometric Matching Strategy by means of which multiple biometric check attempts are allowed to the user. This is to reduce the False Rejection Rate (FRR). For instance, a user is allowed to place again his finger on the biometric sensor for a 2nd try, when the first one fails.

The 2nd try allows the user to upgrade the finger placement, or to place another finger.

Biometric Check Attempts allows an administrator to set:

- **Standard Matching Strategy (1 Attempt):** If the administrator has configured this mode, the user is allowed to place finger only one time. Access is rejected if the authentication fails in the first attempt.
- **Advance Matching Strategy (2 Attempts):** If the administrator has configured this mode, the user is allowed to place finger up to two times. This means that, if authentication fails on the first attempt, terminal will ask user to place again his finger on the biometric sensor, and perform biometric check again.
- **Advanced Matching Strategy with MFU (2 Attempts):** If the administrator has configured this mode, the user is allowed up to two attempts. If authentications fails in the first attempt, terminal will look for the user in the Most Frequent Users list. If the user is not found in this list then user is given a second chance. On the second attempt the terminal will search for a matching biometric in the entire database. This option is solely for identification purposes and not for authentication.

Parameter Configuration

By default, the **Advance Matching Strategy** mode is enabled. Please refer to the table below for further details.

Parameter name	Value	Description
auth_param.additional_bio_check_nb_attempt	1, 2 or 3	Set this parameter to '1' to offer only one attempt. If parameter is '2', terminal allow to perform biometric second time after a first incorrect identification/authentication attempt.

		Setting value to '3' results in workflow similar to two attempt and also enables MFU (Most Frequent User).

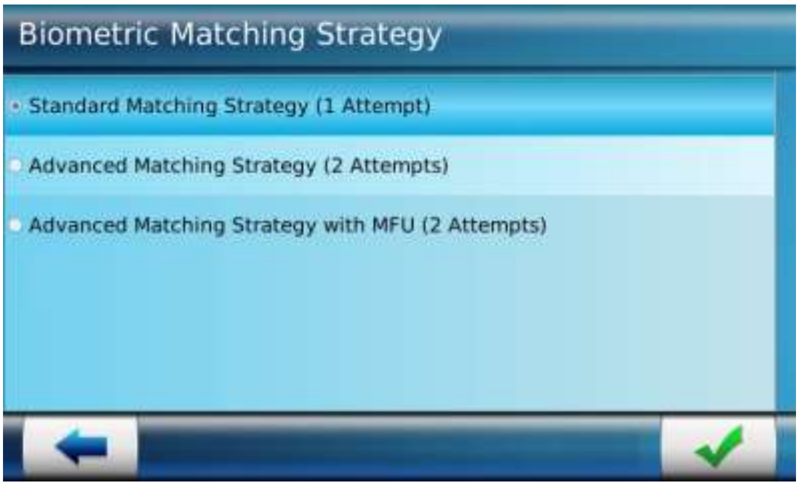
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme	MorphoWave ® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > Biometric Matching Strategy	✓	✗	✗
Webserver	Terminal Settings > Biometric > Biometric Security Settings > Biometric Matching Strategy	✓	✗	✓

Pre-requisites

- The administrator needs to set the Biometric Check Mode as ON

Screens & Steps



Biometric Matching Strategy

● Standard Matching Strategy (1 Attempt)

○ Advanced Matching Strategy (2 Attempts)

○ Advanced Matching Strategy with MFU (2 Attempts)

Figure 192: Selecting Biometric Matching Strategy

1. Select **Biometric Matching Strategy** as Standard, Advance or Advanced with MFU
2. Press on "✓" button to **Save** settings

Results

Terminal performs biometric check as per the configured strategy.

Biometric Timeout

This parameter defines the duration within which the user needs to place finger on the biometric sensor of the terminal. If user fails to place the finger within that period, the access is rejected.

In case of biometric authentication process, after User ID acquisition, the terminal lights on the backlight of the biometric sensor to request the user to place his finger on the sensor. This parameter applies to the wait time for user's finger.

In case of biometric identification process, if user's finger is not recognized, the user has 5 seconds to place again one of his fingers on the biometric sensor. If a finger is placed on the sensor after this delay, then the terminal processes it as a new access request.

The value of this delay is defined by a dedicated parameter:

Parameter name	Value	Description
auth_param.additional_bio_check_timeout	2 – 60	Time allowed to the user, to place again his finger after a first identification which fails. The time can be defined in terms of seconds.

An administrator can follow below screens and steps to configure timeout from terminal.

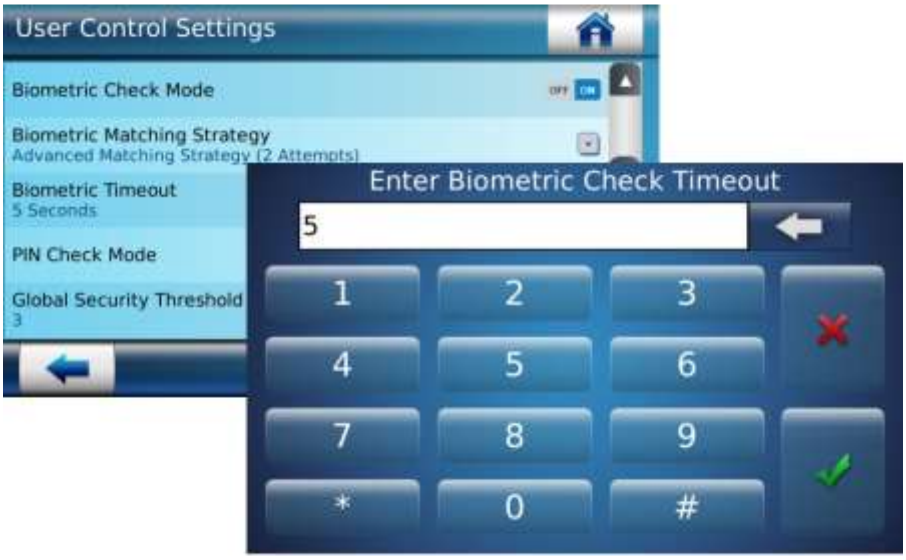
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > Biometric Timeout	✓	✗
Webserver	Terminal Settings > Biometric > Biometric Security Settings > Biometric Timeout	✓	✓

Pre-requisites

- Biometric Check Mode should be set as ON

Screens & Steps



User Control Settings

Biometric Check Mode OFF ON

Biometric Matching Strategy
Advanced Matching Strategy (2 Attempts)

Biometric Timeout
5 Seconds

PIN Check Mode

Global Security Threshold
3

Enter Biometric Check Timeout

5

Figure 193: Biometric Time Out

1. Enter the duration for Biometric Check Timeout. The entered duration is in terms of seconds
2. Use "✓" to save settings

NOTE: Whatever the duration for Biometric Check Timeout, MALite will blink yellow 5 seconds after first unsuccessful biometric attempt before to come back to blue default light. Second biometric attempt could be done during all Biometric Check Timeout duration, whatever the light, yellow blinking or blue fix.

PIN Check Mode

At the time of enrolment, administrator can provide the PIN code along with the biometric data of the user. The administrator can enable **PIN Check Mode** if it is required to authenticate users based on the entered PIN.

In **Identification Mode**, if match is found in database, for the biometric data provided by the user, then the terminal requests the user to enter his PIN code. Access is granted, only if the PIN entered matches with the PIN value stored in database for the user. If the administrator has disabled the biometric mode, the user identification is done based on the entered value of the PIN.

Note: The administrator must set the trigger event through biometric for performing identification.

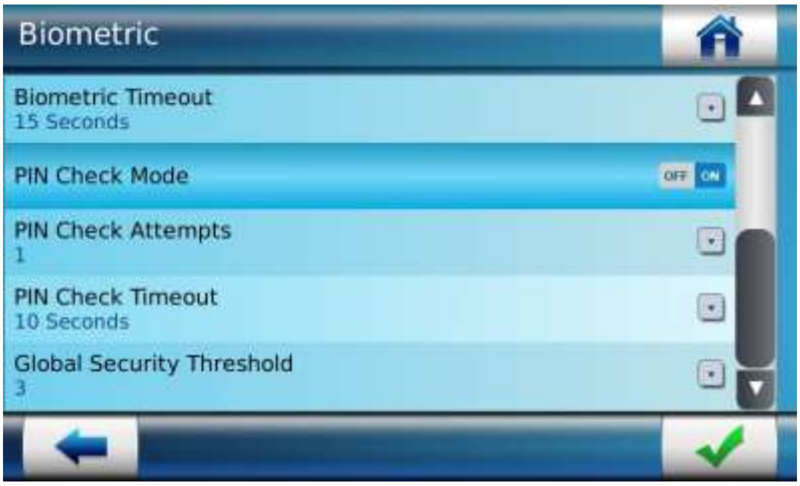
In **Authentication Mode**, The user will have to enter User ID followed by Fingerprint. If fingerprint of the user matches with the corresponding one in the database, then terminal will ask user to enter PIN. Only on successful PIN verification, user access is granted. In case the administrator has disabled the biometric check mode, user authentication is done based on the User ID and PIN.

PIN Check Mode if enabled with Biometric Check Mode, makes the authentication process strong and provides better security.

Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite+ Series	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > PIN Check Mode	✓	✓	✗
Webserver	Control Configuration > User Control > Pin authentication rule	✓	✓	✗

Screens & Steps



Biometric

Biometric Timeout
15 Seconds

PIN Check Mode OFF ON

PIN Check Attempts
1

PIN Check Timeout
10 Seconds

Global Security Threshold
3

Figure 194: Setting PIN Check Mode

1. Set **PIN Check Mode** as OFF or ON.

PIN Check Attempts

The administrator can set this parameter, it indicates the maximum number of attempts a user can get before entering the correct PIN. This feature is helpful in reducing False Rejection Rate, by allowing users to enter PIN accurately on 2nd try.

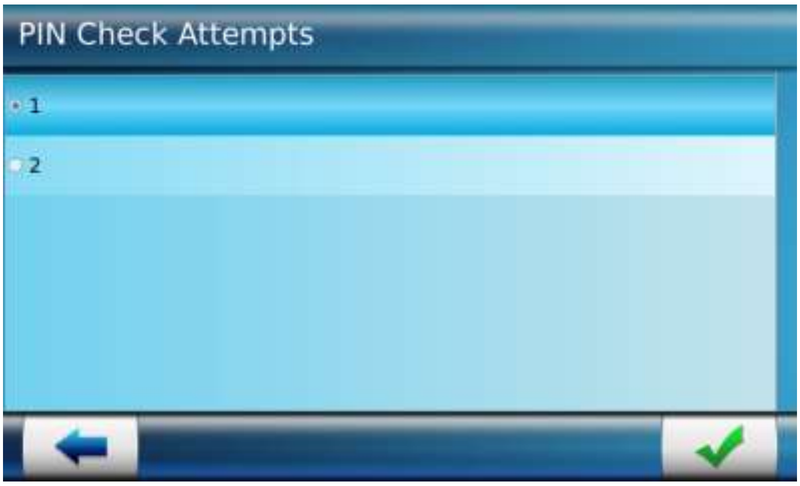
Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite+ Series	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > PIN Check Attempts	✓	✗	✗
Webserver	Terminal Settings > Biometric > Biometric Security Settings > Additional Pin Number of Attempts	✓	✓	✗

Pre-requisites

- PIN Check Mode should be set as ON

Screens & Steps



PIN Check Attempts

○ 1

○ 2

Figure 195: Setting number of PIN Check Attempts

1. Select number of PIN Check Attempts as 1 or 2
2. Press on "✓" button to **Save** settings

PIN Check Time Out

The administrator can configure the PIN Check Time Out. This stands for the duration within which user is required to enter PIN. By default, the PIN Check Time Out is set as 5 seconds, the terminal will deny access, if user fails to enter PIN within the time limit. On access denied, user is again required to enter User ID, fingerprint and PIN for authentication.

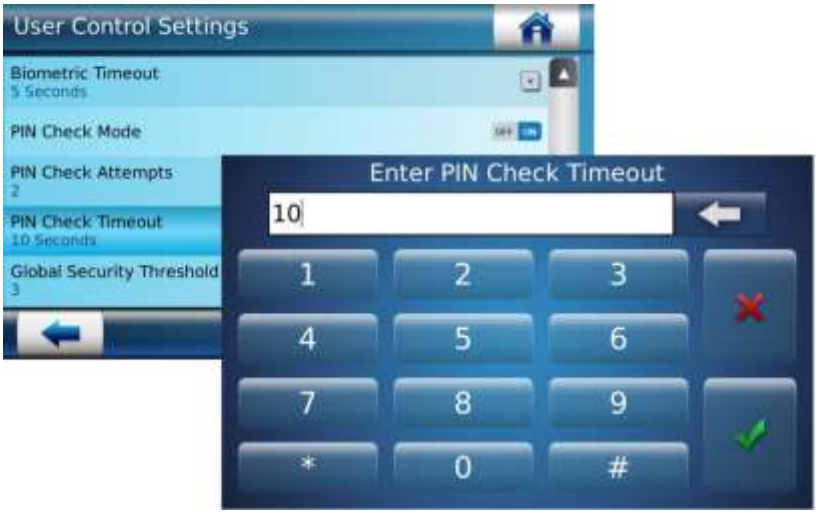
Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite+ Series	SIGMA Lite Series
Terminal Menu	Security Menu > User Control Settings > PIN Check Time Out	✓	✗	✗
Webserver	Terminal Settings > Biometric > Biometric Security Settings Additional Pin Number of Attempts > Pin Check Timeout (in seconds)	✓	✓	✗

Pre-requisites

- PIN Check Mode should be set as ON

Screens & Steps



User Control Settings

Biometric Timeout
5 Seconds

PIN Check Mode

PIN Check Attempts
2

PIN Check Timeout
10 Seconds

Global Security Threshold
3

Enter PIN Check Timeout

10

Figure 196: Setting PIN Check Timeout

1. Enter the duration for Pin Check Timeout. The entered duration is in terms of seconds
2. Use "✓" to save settings

Setting-up Matching Security Threshold

The performances of a biometric system are mainly characterized by two values:

- **False Reject Rate (FRR):** number of wrongly rejected authorized users, divided by the number of access requests,
- **False Acceptance Rate (FAR):** number of wrongly admitted unauthorized users, divided by the number of access requests.

The FAR value can be set according to the level of security decided by the administrator who typically is at the customer's end. However the value of these two characteristics is inversely related: when one value is tuned in one direction the other value will change in the other direction.

When user's convenience is the most important factor, the FAR value must be set to a high value (which reduces the FRR value), and conversely if security is more important, then the FAR must be set to a low value (which increases the FRR).

Different tunings are proposed in the terminal depending on the security level targeted.

Parameter Configuration

The False Acceptance Rate is tuned by a parameter value, which means higher the parameter value lower is the FAR value.

Parameter name	Value	Description
bio_security_settings.matching_threshold	0 to 10	Using this parameter, an administrator can set the threshold for matching the biometric data provided by the user, with the corresponding one in the database.
bio_security_settings. authentication_matching_threshold	0 to 10	Using this parameter, an administrator can set the threshold for matching the biometric data provided by the user for authentication, with the corresponding one in the database

Matching threshold values are detailed in the table below:

Value	Description
0	Lowest threshold value: the number of false rejects is very low, but the number of false acceptances is too high for a secure usage. It is strongly advised not to use this value, because the terminal becomes too tolerant.
1	FAR < 1 %
2	FAR < 0.5 %
3	FAR < 0.1% (Default value) Recommended value for physical access control applications using identification.
4	FAR < 0.05 %
5	FAR < 0.01 %
6	FAR < 0.001 %
7	FAR < 0.0001 %
8	FAR < 0.00001 %
9	FAR < 0.0000001 %
10	Highest threshold value: the number of false acceptance is very low, but the number of false rejections is too high for the comfort of users. It is strongly advised not to use this value, because the terminal becomes too restrictive.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Identification Threshold: Security Menu > User Control Settings > Identification Threshold Authentication Threshold: Security Menu > User Control Settings > Authentication Threshold	✓	✗
Webserver	Terminal Settings > Biometric	✓	✓

Screens & Steps

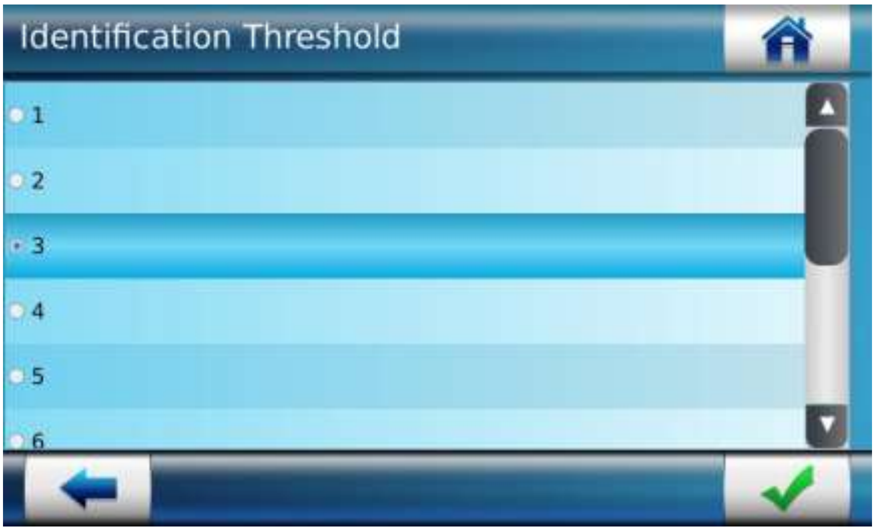


Figure 197: Identification Threshold

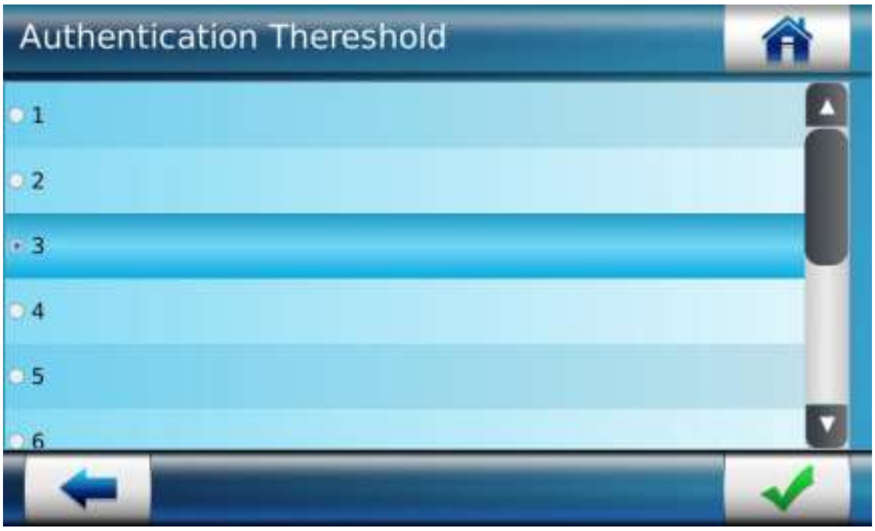


Figure 198: Authentication Threshold

1. Select **Identification/Authentication Threshold** from values 0 to 10
2. Press on "✓" button to **Save** settings

Results

Terminal performs biometric comparison and uses this threshold to determine the result: match or no match.

Anti-Tamper Switch For Terminal Security

Description

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to detect the opening of the box. This detection is controlled by the anti-tamper switch attached in the terminal. The opening of the external USB port cover is not detected.

The administrator can configure the response of the terminal, upon the occurrence of such an event.

- Ignore the event (default setting): useful during normal maintenance operations.
- Send an alarm message to a distant system through the channel already used by the access control result messages (see *Sending an Access Control Result Message* section),
- Emits a local audible signal (see *Terminal States* section).
- Deletes biometric database
- Erase security data (such as contactless authentication keys)

The format of the alarm message is described in the **MorphoAccess® 5G Series – Remote Message Specification** document.

References

- Refer to section "*Tamper Configuration for Terminal Security*" to configure tamper parameters from the terminal administration menu.
- Please refer to the **MorphoAccess® Sigma Series Installation Guide** for more information about the location of the anti-tamper switch on the terminal.

Parameter Configuration

The action(s) to be performed by the terminal on tamper detection is defined by several dedicated parameters:

Parameter Name	Parameter Value	Description
tamper.state	0 or 1	Tamper detection can be enabled or disabled. "0" for disabling the tamper detection "1" for enabling the tamper detection.
tamper.action_auth_iden	0 or 1	"0" indicates that authentication is not disabled on tamper detection. "1" indicates that authentication is disabled on tamper detection.
tamper.action_erase_biometrics	0 or 1	"0" indicates biometric database is not erased on tamper detection. "1" indicates biometric database is erased on tamper detection.
tamper.action_erase_security_data	0 or 1	"0" indicates security data is not erased on tamper detection. "1" indicates security data is erased on tamper detection.
tamper.action_play_mmi	0 or 1	The administrator can configure this parameter to play MMI (Audio), if tamper event is detected. "0" indicates MMI is not played on tamper detection. "1" indicates MMI is played on tamper detection.
tamper.alarm_interval	1500 milliseconds (default)	The administrator can configure alarm interval to send tamper remote message, by using this parameter. As per the defined duration of interval, the tamper alarm is sent to distant systems.

Since the anti-tamper alarm message is sent via the same port/protocol as the access control result messages, the administrator must enable this function, otherwise the alarm message will not be sent (see section "*Sending an Access Control Result Message*")

Alarm Message Sent through Wiegand or Clock & Data

If the administrator needs to send the alarm message through the serial port using Wiegand or Clock & Data protocol; it is mandatory to set below:

- Enable **Tamper event**, to be triggered and send to controller on tamper detection.
- Enable **Tamper Cleared** event, to be triggered and send to controller. Only when Tamper Clear button is pressed, the tamper alarm is stopped and tamper cleared event is sent to controller
- **Wiegand Output** is activated and External Port Output type is selected as Wiegand
- Configure Wiegand Parameter "**wiegand.event_tamper**". It allows setting a Wiegand Output Format which will be used to send the Device Serial Number as ID to alert the door controller about the tamper detection.

  Below are the parameter values which can be set for defining Wiegand string format:

Parameter Values	Format Type	Description
0	tamper_wiegand_fmt_none	No Format
1	wiegand_fmt_130_bit_serial_number	Generate 130 bit Wiegand string containing 128 bit terminal serial number
10	wiegand_fmt_custom_slot0	Custom Wiegand format slot 0
11	wiegand_fmt_custom_slot1	Custom Wiegand format slot 1
12	wiegand_fmt_custom_slot2	Custom Wiegand format slot 2
13	wiegand_fmt_custom_slot3	Custom Wiegand format slot 3
14	wiegand_fmt_custom_slot4	Custom Wiegand format slot 4
15	wiegand_fmt_custom_slot5	Custom Wiegand format slot 5

Parameter Values	Format Type	Description
16	wiegand_fmt_custom_slot6	Custom Wiegand format slot 6
17	wiegand_fmt_custom_slot7	Custom Wiegand format slot 7

Here, Custom Slot indicates the customer format defined for sending Wiegand String. Custom Format can only be set in parameter, if format is defined in corresponding slot.

- Configure parameter "**remote_msg_conf.interface**" is set as value '3', which indicates communication is done using Wiegand channel
- An administrator can also set Clock and Data Identifier for sending alarm message, 65535 (0 – 65535). See "*Event Configuration*".
- For output to be sent in Clock and Data format, **External port output type** should be selected as Clock and Data. See "*Wiegand Parameter Settings*".

Tamper Alarm message using UDP

The administrator can configure the terminal to send an alarm message to a distant system, in case of a tamper event. This communication can happen through Ethernet (or Wi-Fi™), using UDP protocol.

The administrator needs to configure parameters such as "**remote_msg_ip_conf.host_1_protocol**" to 1. This is for enabling communication using UDP protocol

Parameter Name	Parameter Values	Format Type	Description
remote_msg_ip_conf.host_1_protocol	0	Host_TCP	uses TCP protocol for communication (Default)
	1	Host_UDP	uses UDP protocol for communication
	2	Host_SSL	uses SSL over TCP for communication

Network & Communication Security Settings

Authorized IP Configuration

The administrator can use this feature to specify the IP address of the computers that are allowed to communicate with the terminal. Connection requests to the terminal will be rejected for the computers with an IP address not present in the list, despite having a compatible configuration application.

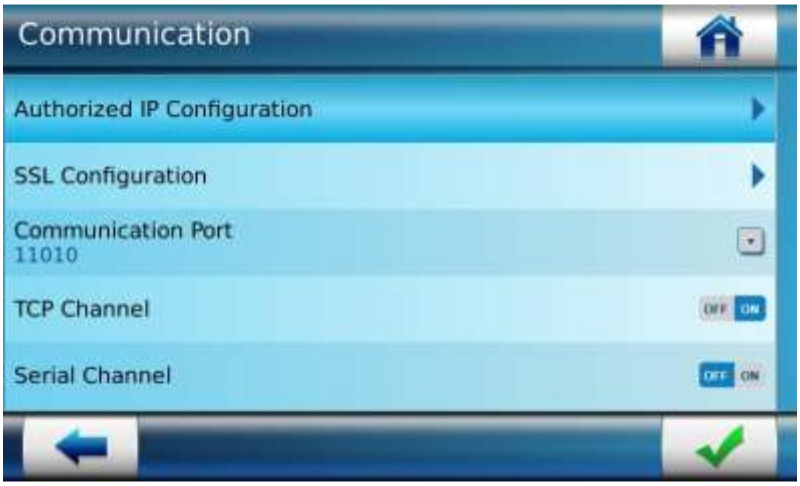
This is a security feature that prevents situations such as modification to the terminal configuration from an unauthorized source.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > Authorized IP Configuration	✓	✗
Webserver	Terminal Settings > Communication > Ethernet Security	✓	✓

Screens & Steps

Set Authorized IP Mode



Communication

Authorized IP Configuration

SSL Configuration

Communication Port
11010

TCP Channel OFF ON

Serial Channel OFF ON

Figure 199: Authorized IP addresses Configuration

1. Select **Authorized IP address Configuration**

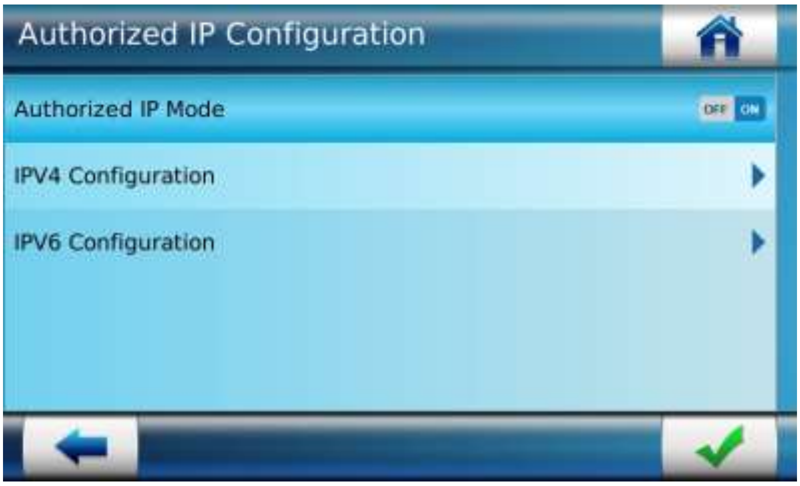


Figure 200: Authorized IP addresses Mode selection

2. The administrator can set the **Authorized IP Mode** as ON or OFF. If this is set as OFF, then any IP address is allowed to connect and communicate with the terminal. If this is set as ON, then the administrator requires adding IP addresses that are authorized to communicate with the terminal.

Add Authorized IP Address

The administrator can add several IP addresses which are authorized to communicate with the terminal, by using this function.

1. Enter IP Addresses by selecting required protocol, i.e. **IPV4** or **IPV6**

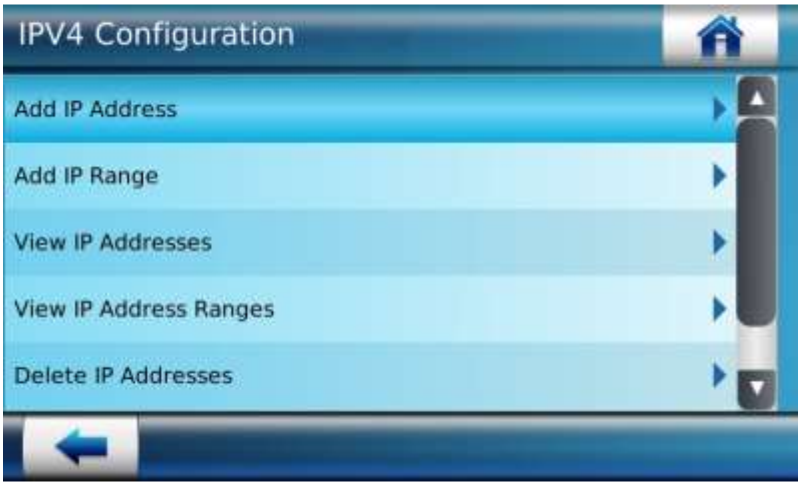
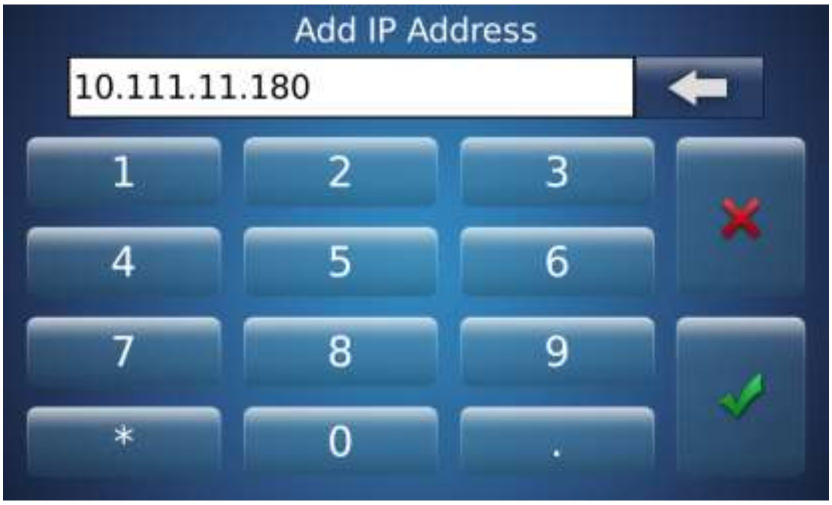


Figure 201: Adding IP for authorization

2. Select **Add IP Address**

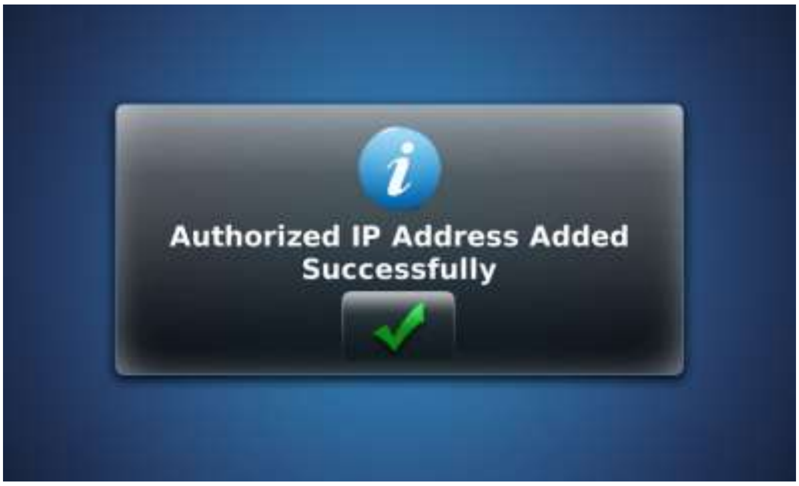


Add IP Address

10.111.11.180

Figure 202: Add IP address

3. The administrator can Add IP Address of the computer that can talk to the terminal.
4. Press on "✓" icon to save

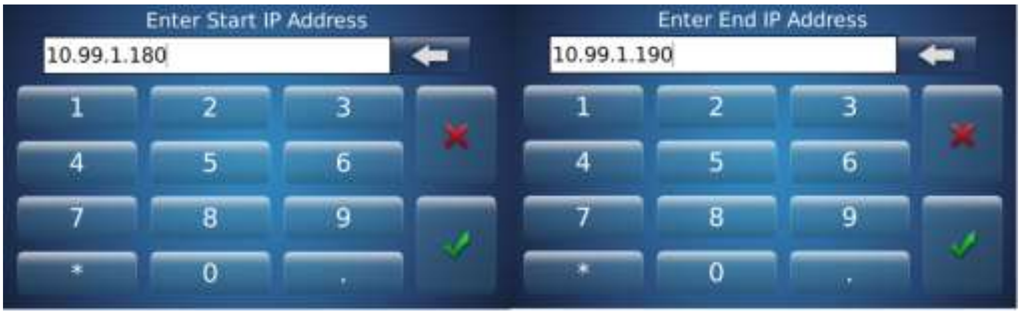


Authorized IP Address Added Successfully

Figure 203: A success message is displayed showing IP Address is added successfully

Configure IP Addresses Range

The administrator can add an IP Address Range, this is to authorize computers having IP addresses in the specified range to communicate with Morpho Access® terminal. None other than the specified range of computers can communicate with the terminal.



Enter Start IP Address

10.99.1.180

Enter End IP Address

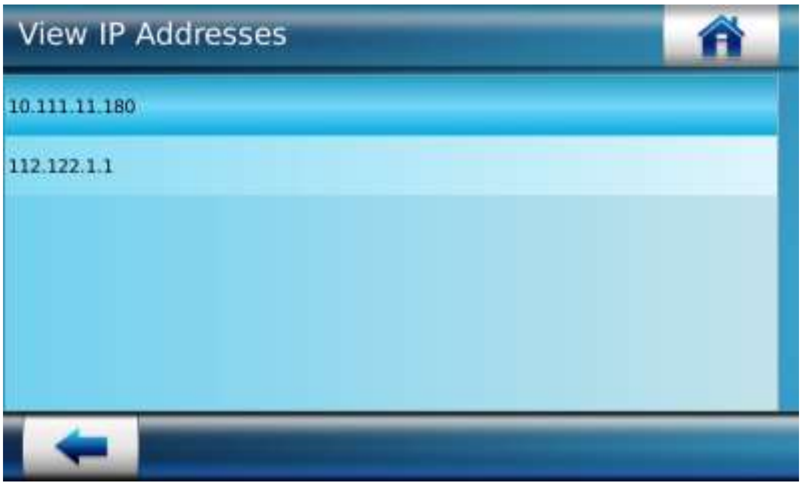
10.99.1.190

Figure 204: Entering IP Range for authorizing

1. Select **Add IP Range**. Enter **Start IP Address**
2. Enter End IP Address
3. Press on "✓" icon to save

View IP Address

The administrator can view the IP Addresses that are added and authorized to communicate with the terminal, by using this functionality.


View IP Addresses

10.111.11.180

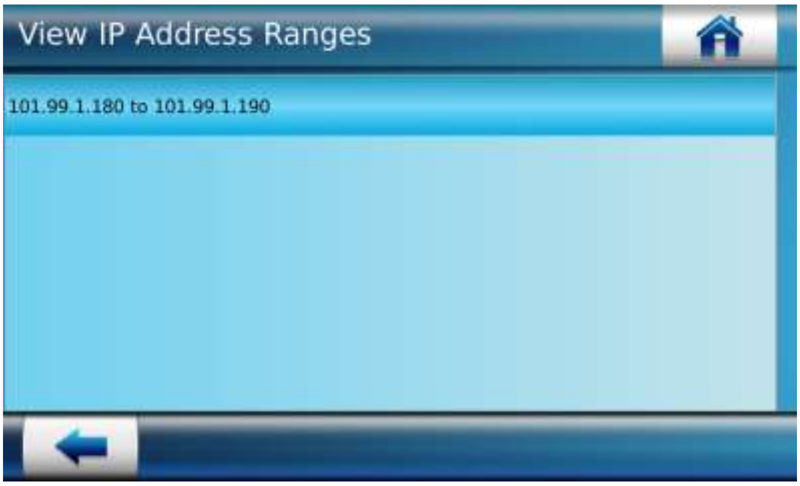
112.122.1.1

Figure 205: Viewing authorized IP Addresses

1. Press on **View IP Addresses**. List of IP Addresses authorized is displayed

View IP Range

The administrator can view the Range of IP Addresses that are added and authorized to communicate with terminal, by using this functionality.


View IP Address Ranges

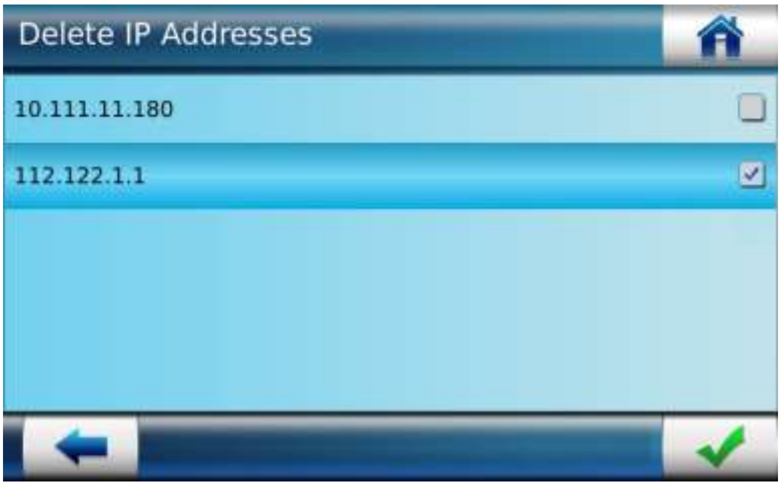
101.99.1.180 to 101.99.1.190

Figure 206: Viewing IP Address Range

1. Press on **View IP Address Range**. List of IP Addresses authorized is displayed

Delete IP Address

The administrator can delete an IP Address, by using this functionality. It allows the administrator to select several IP addresses and delete them. Once deleted, that computer cannot communicate with the terminal.



10.111.11.180 □

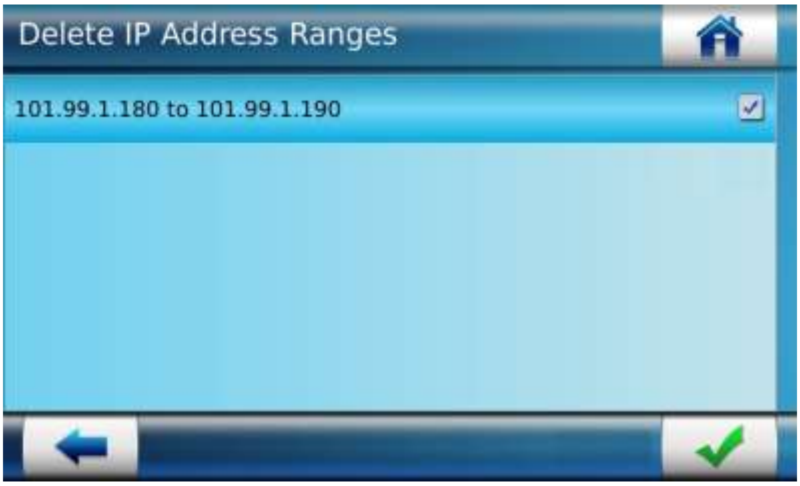
112.122.1.1 ☑

Figure 207: Deleting an IP Address

1. Select an **IP Address** that the administrator needs to delete.
2. Press on "✓" to delete an IP address.
3. A confirmation message is displayed showing IP address is deleted

Delete IP Address Range

The administrator can delete an IP Address Range, by using this functionality. It allows an administrator to select several IP addresses range and delete them. Once deleted, computers having IP addresses in that range are not allowed to communicate with terminal.



101.99.1.180 to 101.99.1.190 ☑

Figure 208: Delete an IP Address Ranges

1. Select an **IP Address Range** that the administrator needs to delete.
2. Use "✓" to delete
3. A confirmation message is displayed showing that the IP Address Range is deleted

SSL Configuration

Secure Sockets Layer (SSL) and its successor Transport Layer Security (TLS) are cryptographic protocol designed to provide communication security over Ethernet or Wi-Fi™ channels.

These protocols are used to protect the communication between the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal and a distant system, such as a central access controller or a terminal configuration station.

The cryptographic protocols supported by the terminal are listed below:

- SSLv3
- SSLv23
- TLS 1.0
- TLS 1.1
- TLS 1.2

The terminal supports the algorithms listed below for communication security:

- AES128-SHA OpenSSL cipher suite
- AES256-SHA OpenSSL cipher suite
- AES128-SHA256 OpenSSL cipher suite
- AES256-SHA256 OpenSSL cipher suite
- AES128-GCM-SHA256 OpenSSL cipher suite
- ECDHE-ECDSA-AES256-SHA OpenSSL cipher suite
- ECDHE-ECDSA-AES128-GCM-SHA256 OpenSSL cipher suite
- ECDHE-ECDSA-AES128-SHA256 OpenSSL cipher suite
- ECDHE-ECDSA-AES128-SHA OpenSSL cipher suite

NOTE: The communication security is automatically configured during negotiation between the client and the server. The client specifies the security level requested, and the server accepts or proposes a lower level. The client accepts it or cancels its request. The final configuration corresponds to the highest security level that is common between the client and the server.

Compatibility of cipher algorithms with SSL protocol versions

Cipher Algorithm List	**Protocol Version**				
	sslv23	**sslv3**	**tlsv1**	**tlsv1.1**	**tlsv1.2**
AES128-SHA	Y	Y	Y	Y	Y
AES256-SHA	Y	Y	Y	Y	Y
AES128-SHA256	N	N	N	N	Y
AES256-SHA256	N	N	N	N	Y
AES128-GCM-SHA256	N	N	N	N	Y
ECDHE-ECDSA-AES256-SHA:ECDH-ECDSA-AES256-SHA	Y	Y	Y	Y	Y
ECDHE-ECDSA-AES128-GCM-SHA256:ECDH-ECDSA-AES128-GCM-SHA256	N	N	N	N	Y
ECDHE-ECDSA-AES128-SHA256:ECDH-ECDSA-AES128-SHA256	N	N	N	N	Y
ECDHE-ECDSA-AES128-SHA:ECDH-ECDSA-AES128-SHA	Y	Y	Y	Y	Y

NOTE: Cipher algorithm that ends with ‘SHA256’ supports only SSL protocol version tls1.2.

SSL Protocol Versions support for communication

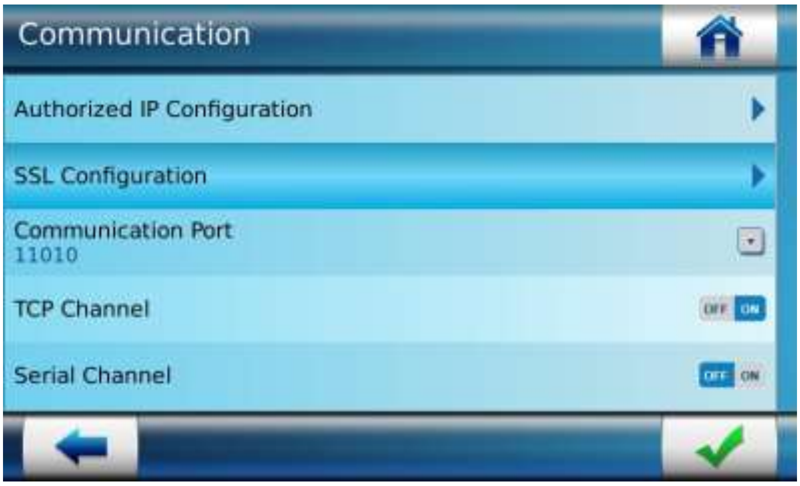
	Client side (from PC application)					
		sslv23	sslv3	tlsv1	tlsv11	tlsv12
On Terminal	sslv23	Y	Y	Y	Y	Y
	sslv3	Y	Y	N	N	N
	tlsv1	Y	N	Y	N	N
	tlsv11	Y	N	N	Y	N
	tlsv12	N	N	N	N	Y

The above table describes the protocol versions supported by the client side application, when communication is started by the terminal using a specific protocol. E.g. If the terminal starts communication using sslv23 protocol, then client side application will be able to communicate using all the protocol versions. While if communication is initiated using sslv3 protocol, then client application will only support sslv23 and sslv3 protocol versions for communication.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > SSL Configuration > Input Channel	✓	✗
Webserver	Terminal Settings > Communication > SSL Configuration	✓	✓

Screens & Steps


Communication

Authorized IP Configuration

SSL Configuration

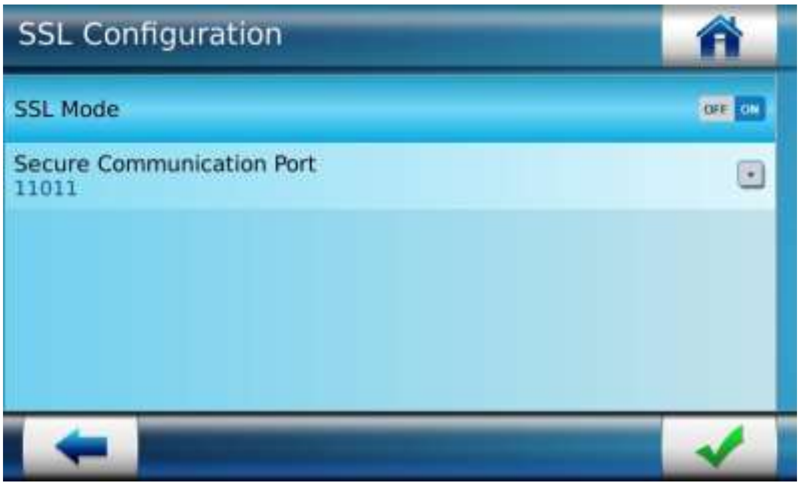
Communication Port
11010

TCP Channel OFF ON

Serial Channel OFF ON

Figure 209: SSL Configuration

1. Select SSL Configuration
2. On next screen select **Input Channel**

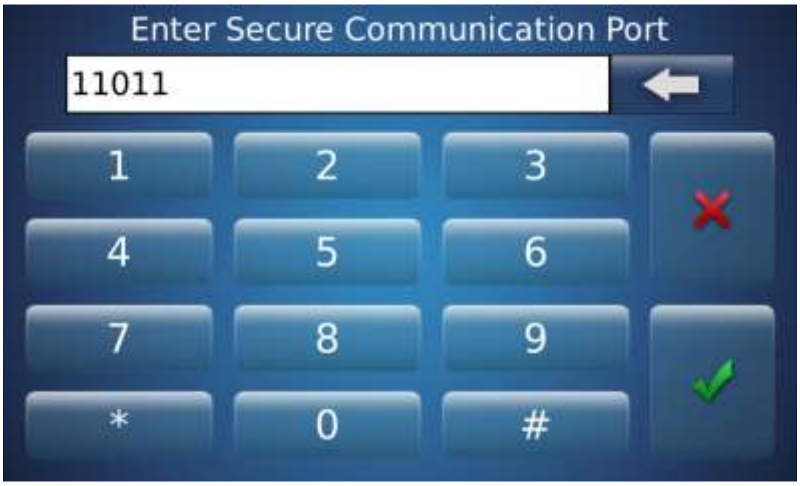

SSL Configuration

SSL Mode OFF ON

Secure Communication Port
11011

Figure 210: Configuring SSL Mode and parameters

3. Select **SSL Mode** as ON or OFF. Only if the SSL Mode is ON, the SSL protocol is used


Enter Secure Communication Port

11011

Figure 211: Entering Secure Communication Port

4. **Enter Secure Communication Port**: port that will be used for TLS or SSL protocol
5. **Use** "✓" button to save

NOTE: System secure configuration with TLS is fully described in MorphoAccess - Recommendations for Secure Installation.pdf

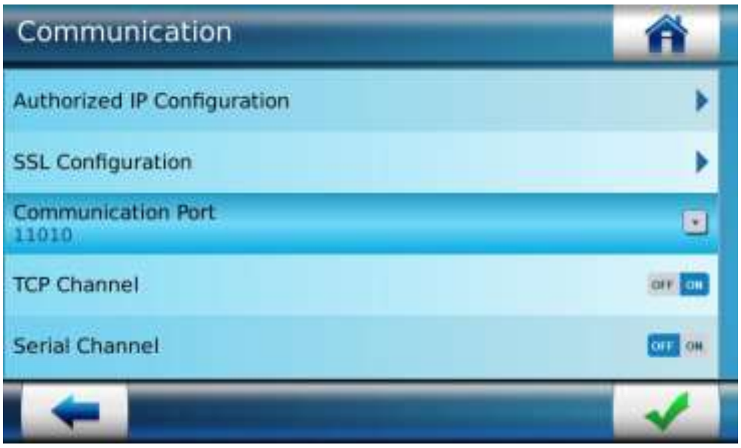
Default Communication Port

The administrator can define a default communication port that will be used for Ethernet connection, by using this functionality.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > TCP Channel	✓	✗
Webserver	Terminal Settings > Communication > Communication Channels Configuration	✓	✓

Screens & Steps



Communication

Authorized IP Configuration

SSL Configuration

Communication Port
11010

TCP Channel — OFF **ON**

Serial Channel — **OFF** ON

Figure 212: Selecting Communication Port

1. Select **Communication Port** option

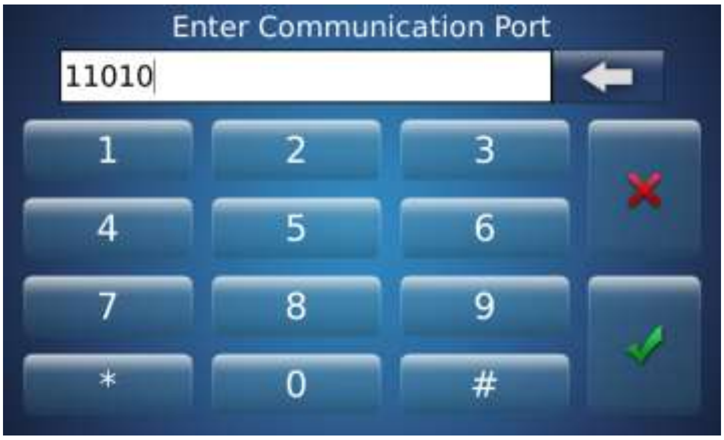


Figure 213: Entering Communication Port

2. Enter **Communication Port**: port that will be used for TCP (plain text)
3. Use "✓" button to save

Enabling TCP Channel

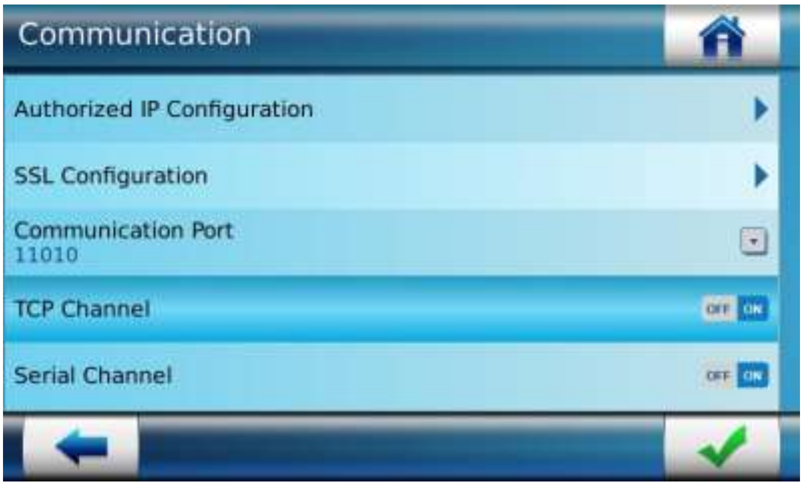
Transmission Control Protocol (TCP) is a protocol that is used for transmission of the input/output messages between the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal and distant systems, such as external controllers or Webserver application, connected through Ethernet/Wi-Fi™.

By default, the TCP Channel is enabled. If the administrator has disabled this parameter, the terminal will not be able to communicate (i.e. input or output of messages) with distant systems using Ethernet/Wi-Fi™.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > TCP Channel	✓	✗
Webserver	Terminal Settings > Communication > Communication Channels Configuration	✓	✓

Screens & Steps



Communication

Authorized IP Configuration

SSL Configuration

Communication Port
11010

TCP Channel OFF ON

Serial Channel OFF ON

Figure 214: Configuring TCP Channels

1. The administrator needs to select the **TCP Channel** as ON if it is required to use TCP protocol for communication
2. Use "✓" to Save

Enabling Serial Channel

Serial Channel is used for transmission of the input/output messages between the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal and distant systems, such as external controllers, connected through RS422 and RS485.

By default, Serial Channel is disabled. If the administrator enables this parameter, the terminal will able to communicate (i.e. input/output messages) with distant systems using Serial channel.

NOTE: Serial channel cannot be used for configuration of the terminal with the Webserver.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > Serial Channel	✓	✗
Webserver	Terminal Settings > Communication > Serial Configuration	✓	✓

Screens & Steps

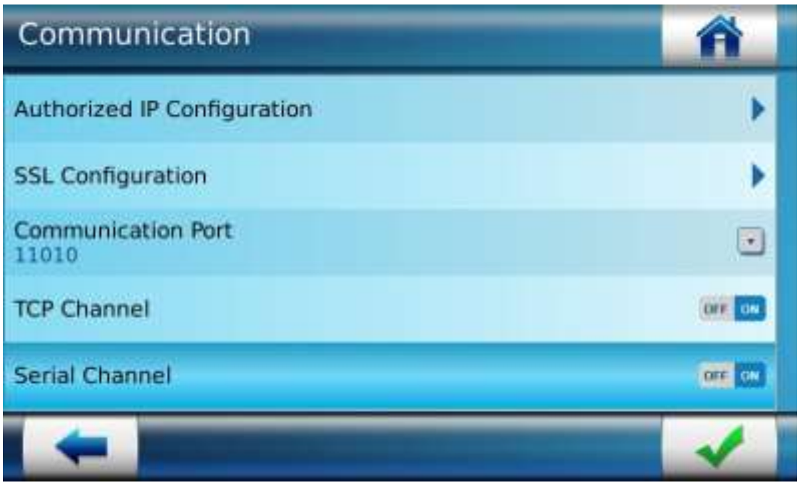


Figure 215: Enabling/Disabling RS422/RS485 Serial Chanel

1. Select the **Serial Channel** as ON or OFF
2. Use "✓" to Save

Additional User Verification Settings

When the administrator enables this feature, the terminal evaluates the access rights with the data of two different users, instead one user. It implies that, when access rights are based on the biometric data check, the terminal requires the fingerprint of two different users, to grant the access.

Set Additional Users

Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > Additional User Verification > Additional Users	✓	✗
Webserver	Control Configuration > User Control	✓	✓

Screens & Steps

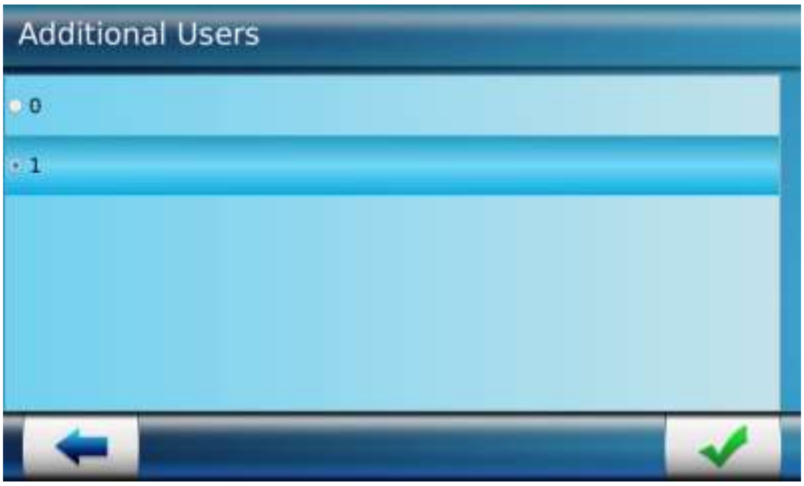


Figure 216: Addition User Verification

1. Select '0' to disable additional users mode (default): access rights check requires the data of only one user

2. Select '1' to enable additional users mode with 2 users: access rights check requires the data of two users
3. Use “✓” to **Save**

Set Additional Users Verification Timeout

The administrator can set this parameter to set the duration within which the additional user has to place finger on the biometric sensor. If the finger is not presented on the sensor within the time limit, access will be denied.

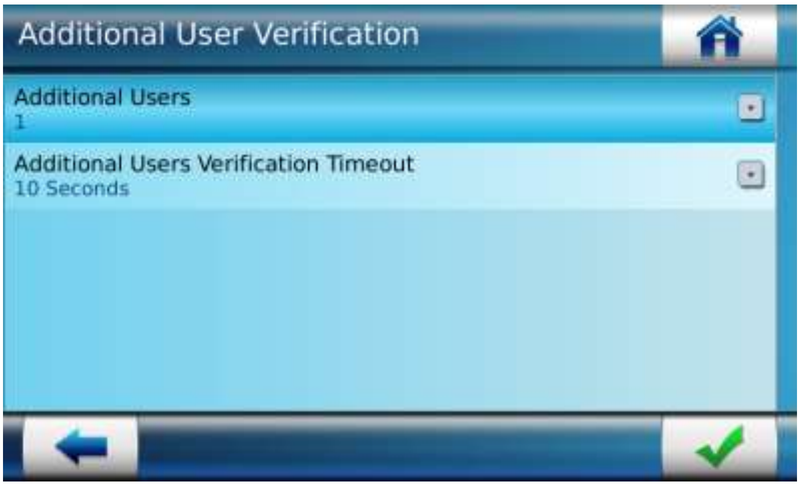
Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > Additional User Verification > Additional Users Verification Timeout	✓	✗
Webserver	Control Configuration > User Control Configurations > Multi-finger Timeout (sec)	✓	✓

Pre-requisites

- Multiple users feature must be activated: Additional Users should be selected as ‘1’

Screens & Steps

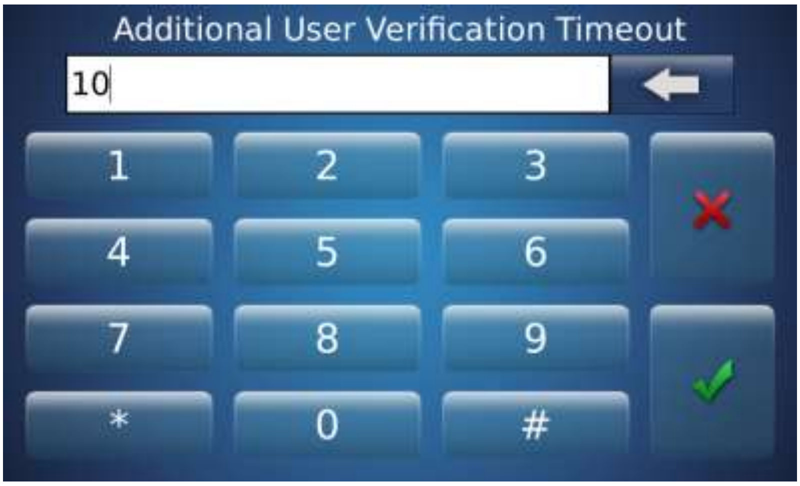


Additional Users
1

Additional Users Verification Timeout
10 Seconds

Figure 217: Additional User Verification Timeout

1. Press on **Additional Users Verification Timeout**



10

Figure 218: Additional User Verification Timeout

2. Enter the **Time limit**
3. Use "✓" button to save

Change LCD Password

An administrator can login to the terminal using an LCD Password. In order to prevent any unauthorized access, it is recommended to change the password periodically. The administrator can change the LCD password, by using this functionality.

The password is a numeric value with 4 digits minimum and 8 digits maximum.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Communication > Change LCD Password	✓	✗

Pre-requisites

- Only an Administrator can change LCD Password

Screens & Steps

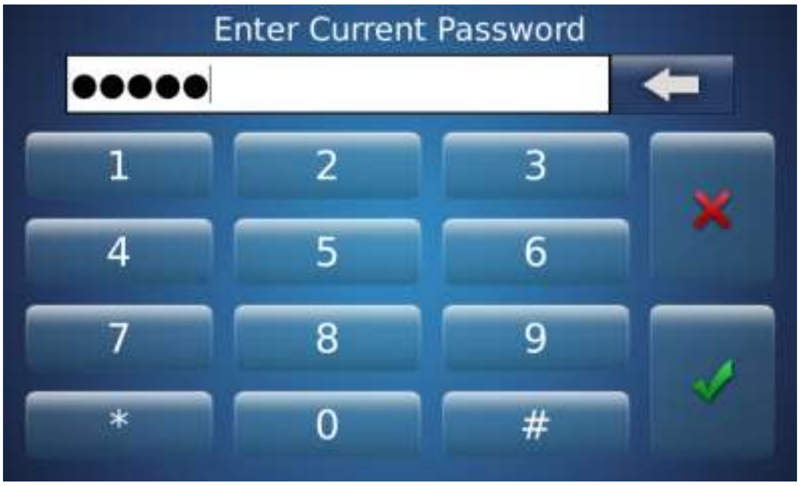


Figure 219: Resetting Device Password

1. Enter **Current Password** and use "✓" button to move on next screen

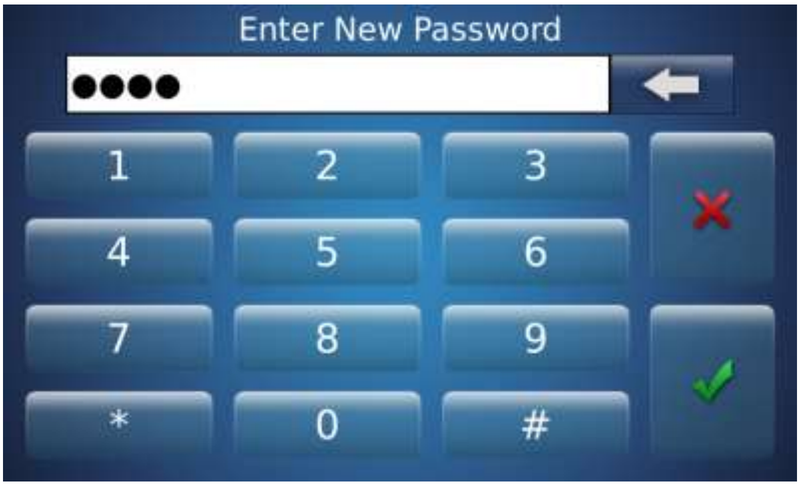


Figure 220: Entering New Password

2. Enter the **New Password** of choice
3. Use "✓" button to move on next screen

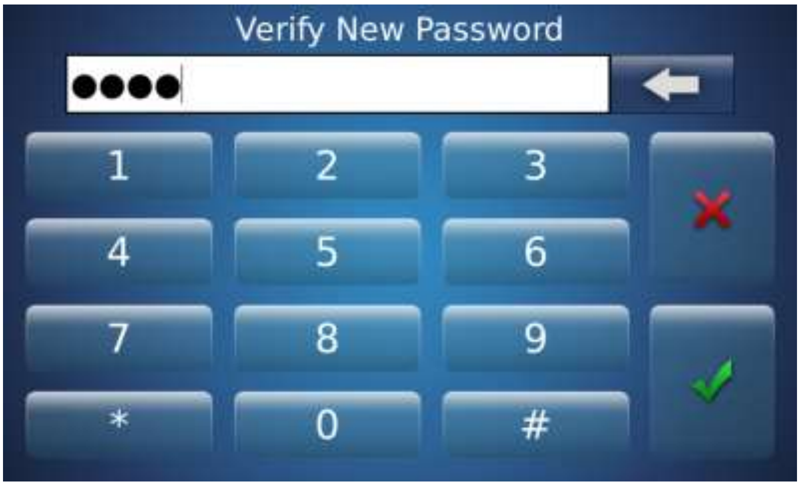


Figure 221: Verifying New Password

4. Re-enter the **New Password** for verification
5. Use "✓" button to **Save**

Results

Administrator can login to LCD using the new password.

Additional User Control Settings

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal administrator can set as to which access control parameters are applicable to allow access to the additional users, by using this functionality.

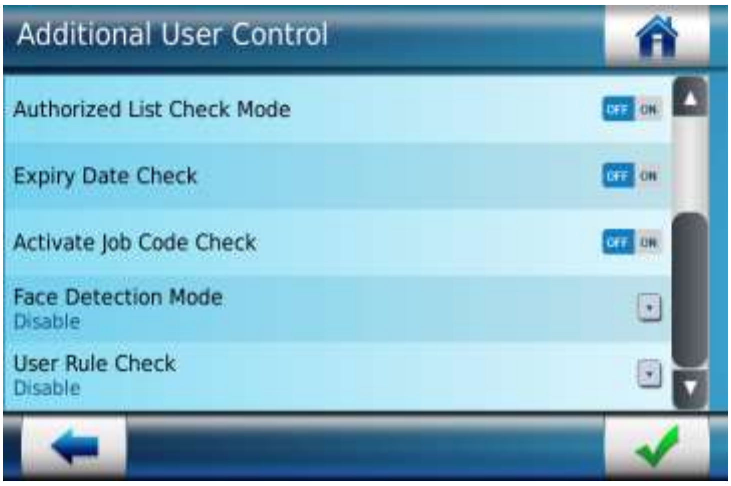
Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Security Menu > Additional User Control	✓	✗
Webserver	Control Configuration > User Control	✓	✓

Pre-requisites

- Multiple Users feature must be enabled: Additional User Verification should be set to 1

Screens & Steps



Additional User Control

Authorized List Check Mode OFF

Expiry Date Check OFF

Activate Job Code Check OFF

Face Detection Mode
Disable

User Rule Check
Disable

Figure 222: Additional User Control

The administrator can configure the parameters mentioned below for Additional User access control:

1. **Access Schedule:** This parameter indicates, whether the terminal should check the access schedule of the enrolled user

2. **Holiday Schedule:** This parameter indicates, whether the terminal should check the holiday schedule of the enrolled user
3. **Door Open Schedule:** This parameter indicates, whether terminal should check the door open schedule of the enrolled user
4. **Authorized List Check Mode:** At the time of enrolment the administrator can set whether the user is an authorized user or not. Authorized user does not need to provide biometric verification
5. **Expiry Date Check:** this parameter indicates, whether terminal should check the expiry date of the enrolled user
6. **Job Code Check Activation:** When the administrator enables this parameter, each time the user tries to access, user will have to place finger as well provide Job Code for verification. The administrator can set a job code for a given user at the time of enrollment.

   Note: When the Time and Attendance mode is enabled, entering the job code during authentication is optional even though the Job Code Check is enabled. It is based on the value of the parameter *time_and_attendance.jobcode_by_key* and selected time and attendance key during authentication.

7. **Job Code Check Duration:** this parameter indicates the duration within which user will be required to enter the job code after a biometric check. If user fails to enter job code within this duration, the terminal will deny access.
8. **Face Detection Mode:** (SIGMA Family only) The administrator can configure face authentication check rule as depicted in the snapshot below.

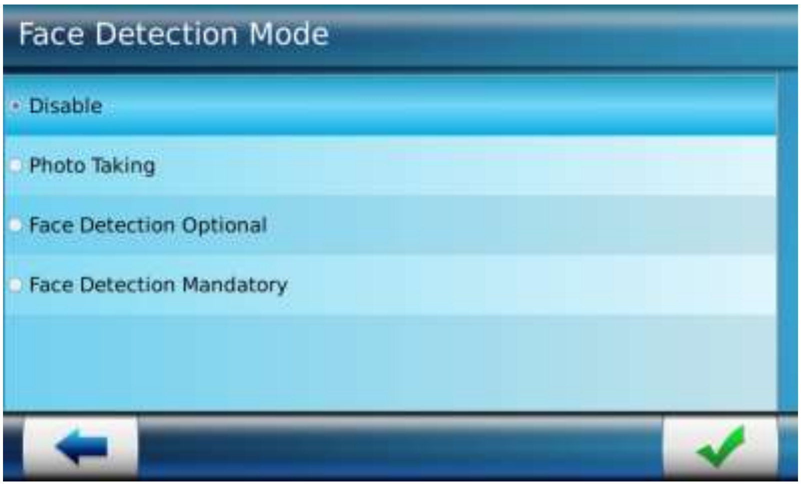


Figure 223: Enable or Disable Face detection mode

A parameter has been added in the "Complete Configuration" Screen of the Web Server named ucc.users_photo_policy, whose possible values can be 1, 2 or 3.

- If the administrator sets this as 1, the images for only those users who have been granted access, shall be saved.
- If the administrator sets the as 2, the images for only those users who have not been granted access, shall be saved.
- If the administrator sets the as 3, the images for users that are granted as well as not granted access, shall be saved.

Please refer to the table below in order to understand the face detection workflow:

User Rule_Face Detection	Terminal_Face Detection	ucc.users_ photo_policy	Successful Identification	Failed Identification	Failed Authentication
Disable	Disable	1	No	No	No
Disable	Disable	2	No	No	No
Disable	Disable	3	No	No	No
Disable	Photo Taking	1	Yes	No	No
Disable	Photo Taking	2	No	Yes	Yes
Disable	Photo Taking	3	Yes	Yes	Yes
Disable	Face Detection Optional	1	Yes	No	No
Disable	Face Detection Optional	2	No	Yes	Yes
Disable	Face Detection Optional	3	Yes	Yes	Yes
Disable	Face Detection Mandatory	1	Yes	No	No
Disable	Face Detection Mandatory	2	No	Yes	Yes
Disable	Face Detection Mandatory	3	Yes	Yes	Yes
Photo Taking	Disable	1	Yes	No	No
Photo Taking	Disable	2	No	No	Yes
Photo Taking	Disable	3	Yes	No	Yes
Photo Taking	Photo Taking	1	Yes	No	No
Photo Taking	Photo Taking	2	No	Yes	Yes
Photo Taking	Photo Taking	3	Yes	Yes	Yes
Photo Taking	Face Detection Optional	1	Yes	No	No
Photo Taking	Face Detection Optional	2	No	Yes	Yes
Photo Taking	Face Detection Optional	3	Yes	Yes	Yes

User Rule_Face Detection	Terminal_Face Detection	ucc.users_ photo_policy	Successful Identification	Failed Identification	Failed Authentication
Photo Taking	Face Detection Mandatory	1	Yes	No	No
Photo Taking	Face Detection Mandatory	2	No	Yes	Yes
Photo Taking	Face Detection Mandatory	3	Yes	Yes	Yes
Face Detection Optional	Disable	1	Yes	No	No
Face Detection Optional	Disable	2	No	No	Yes
Face Detection Optional	Disable	3	Yes	No	Yes
Face Detection Optional	Photo Taking	1	Yes	No	No
Face Detection Optional	Photo Taking	2	No	Yes	Yes
Face Detection Optional	Photo Taking	3	Yes	Yes	Yes
Face Detection Optional	Face Detection Optional	1	Yes	No	No
Face Detection Optional	Face Detection Optional	2	No	Yes	Yes
Face Detection Optional	Face Detection Optional	3	Yes	Yes	Yes
Face Detection Optional	Face Detection Mandatory	1	Yes	No	No
Face Detection Optional	Face Detection Mandatory	2	No	Yes	Yes
Face Detection Optional	Face Detection Mandatory	3	Yes	Yes	Yes
Face Detection Mandatory	Disable	1	Yes	No	No
Face Detection Mandatory	Disable	2	No	No	Yes
Face Detection Mandatory	Disable	3	Yes	No	Yes
Face Detection Mandatory	Photo Taking	1	Yes	No	No
Face Detection Mandatory	Photo Taking	2	No	Yes	Yes
Face Detection Mandatory	Photo Taking	3	Yes	Yes	Yes

User Rule_Face Detection	Terminal_Face Detection	ucc.users_ photo_policy	Successful Identification	Failed Identification	Failed Authentication
Face Detection Mandatory	Face Detection Optional	1	Yes	No	No
Face Detection Mandatory	Face Detection Optional	2	No	Yes	Yes
Face Detection Mandatory	Face Detection Optional	3	Yes	Yes	Yes
Face Detection Mandatory	Face Detection Mandatory	1	Yes	No	No
Face Detection Mandatory	Face Detection Mandatory	2	No	Yes	Yes
Face Detection Mandatory	Face Detection Mandatory	3	Yes	Yes	Yes

Table 1 : Face Authentication Workflow

Refer below table for face authentication workflow for normal user and VIP user:

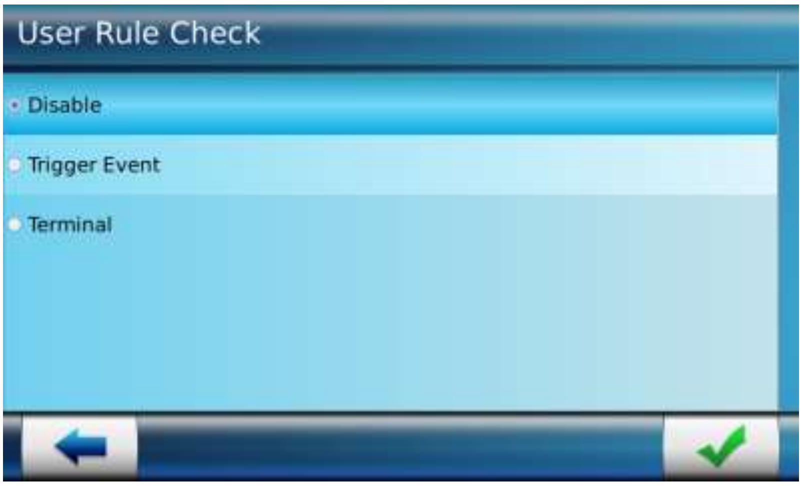
Face Detection Mode	Behavior	Behavior for VIP user
Disabled	Do not take pictures	Disabled
Photo Taking	Take one picture and save it according to logging policies(ucc.users_photo_policy)	As per 'Photo Taking'
Face Detection Optional	Take multiple pictures and perform face detection. If a face is detected in one or multiple photo, save the photo with the best face detection quality measure. • Face detection process ends when user control workflow gets completed • No use of face detection timeout	As per 'Face Detection Optional'
Face Detection Mandatory	Take multiple pictures and perform face detection. If no photo contains a face, the user is rejected. • Perform face detection till timeout if no face is detected (even if user control workflow gets completed)	As per 'Face Detection Optional'

Table 2 : Face Authentication Workflow for Normal and VIP User

References

Refer to "*Recommended Conditions for Face Detection*" for knowing the correct position of the user and required lighting conditions in order to achieve correct face detection.

9. User Rule Check: This parameter defines the user rule check flow, whether to apply the user rules configured on terminal or on trigger event. The possible values are "Disabled", "Trigger Event" and "Terminal".


User Rule Check

● Disable
○ Trigger Event
○ Terminal

Figure 224: User Rule Check

If the per user rule (ucc.per_user_rule) is defined to Terminal then Terminal will verify user data (source of data defined from ucc.user_record_reference) based on User Rule configured in Terminal (reference: *User Enrollment in Database*). If User Rule is set to "Trigger Event", the configuration/details from which user control is initiated are applied. The default value of "User Rule Check" is "Disable".

USB Menu

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is equipped with a USB Port that is to connect a USB Mass Storage, temporarily.

Following are the uses of USB connection:

- The administrator can upgrade firmware
- The administrator can import data to the terminal such as the User Database. It is also used to import the Audio files, Video files, and Images that are used in Multimedia Configuration.
- The administrator can export data from the terminal. Transaction logs, Error Logs and User records can be exported from the terminal.

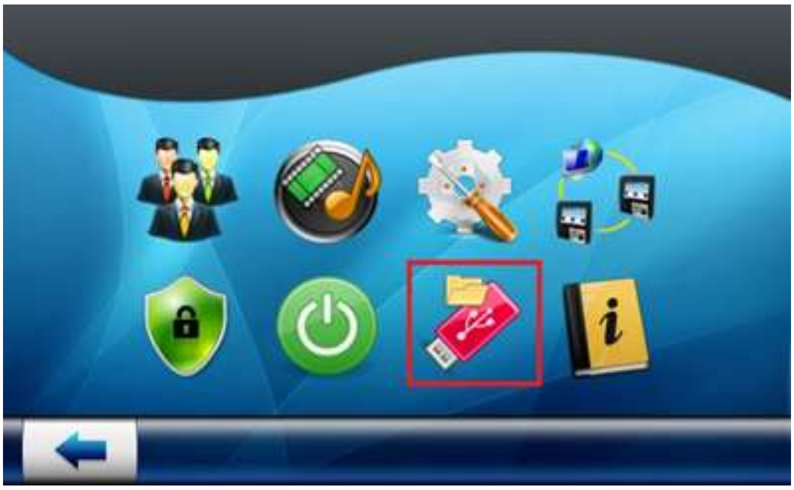


Figure 225: USB Menu in MorphoAccess® SIGMA Series Terminal

Enable or Disable USB port

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal Administrator Menu can enable or disable USB port. All the USB functionalites (like USB script execution, USB Import/Export etc) are available for the user only if the USB port is enabled.

The administrator can also enable or diable USB port from **Webserver** or **MorphoBioToolBox** by using parameter "comm_channels_state.USB_script".

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > USB port enable	✓	✗
MorphoBioToolbox	MorphoBioToolbox > Manage Configuration Keys	✓	✓
Webserver	Webserer > Complete Configuration	✓	✓

Screens & Steps

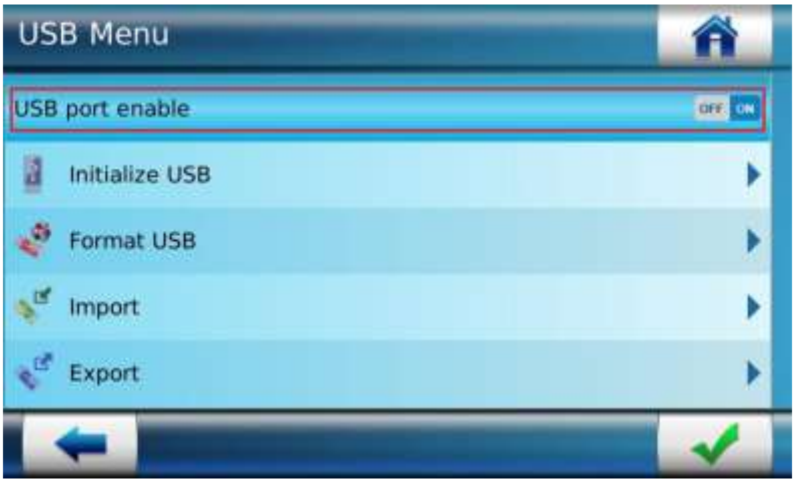


Figure 226: Enable/Disable USB port

1. Select 'ON' to enable USB port or 'OFF' to disable USB port
2. Use "✓" to **Save.**

Initialize USB Mass Storage device

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal administrator must ensure that all the folders in the USB Mass Storage device have the same structure as on the terminal. This can be done using the **Initialize USB Mass Storage device** functionality. By using this, the terminal will copy the same folder structure in the USB Mass Storage device.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Initialize USB	✓	✗

Pre-requisite

- USB Mass Storage device must be empty.
- Prior to store any data on USB Mass Storage device, it is mandatory that the device is initialized.
- Connect the USB Mass Storage device for initialization, only once MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is up and running (even when terminal is rebooted, it must be up and running)

Screens & Steps

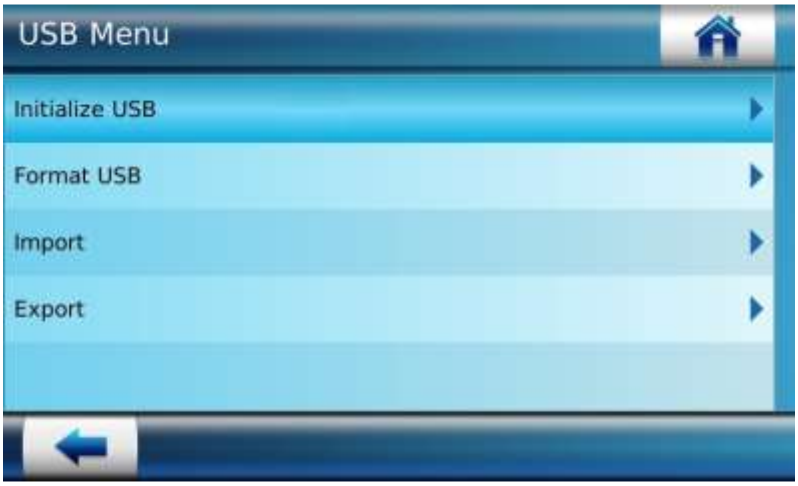
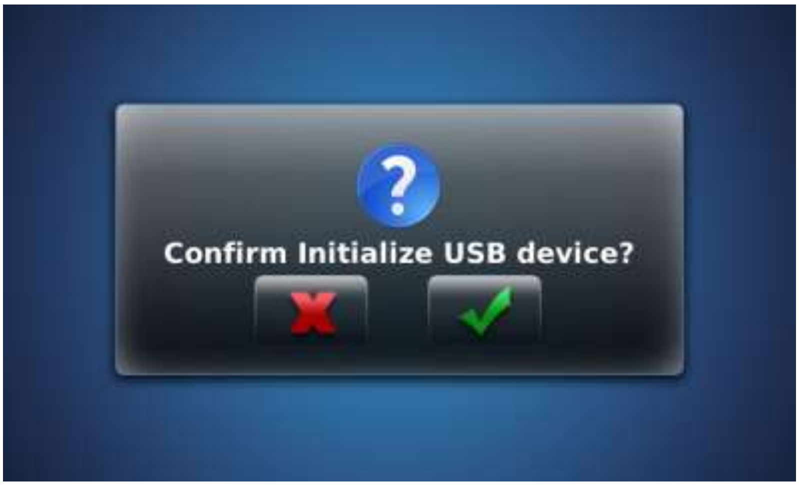


Figure 227: Initialize USB Mass Storage device

1. Connect USB Mass Storage device to terminal

2. Press on **Initialize USB**



Confirm Initialize USB device?

Figure 228: A confirmation message is displayed

3. Confirm Initialize USB Mass Storage device by using "✓" button

Results

A success message is displayed showing USB Mass Storage device is initialized. Now the administrator can use the USB Mass Storage device to upload or download data to or from the terminal.

Format USB Mass Storage device

The administrator can use the Format USB Mass Storage device functionality to delete the entire data stored in a USB Mass Storage device. Once the device is formatted, it can be initialized to store the same folder structure as in the terminal.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Format USB	✓	✗

Screens & Steps

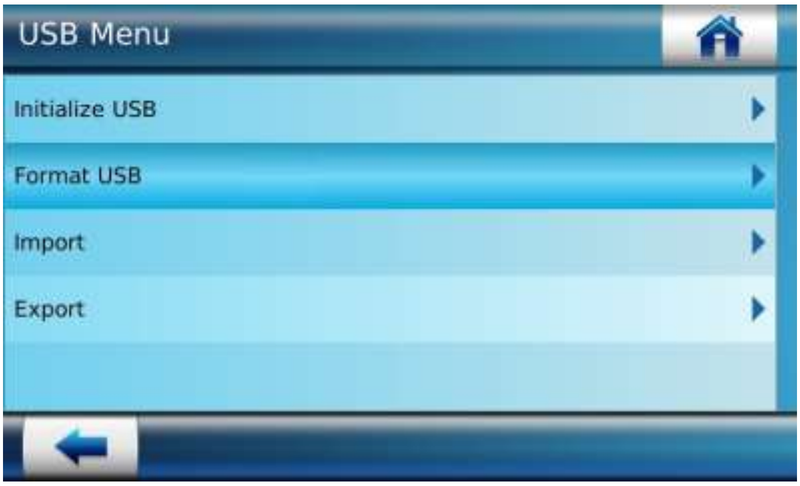
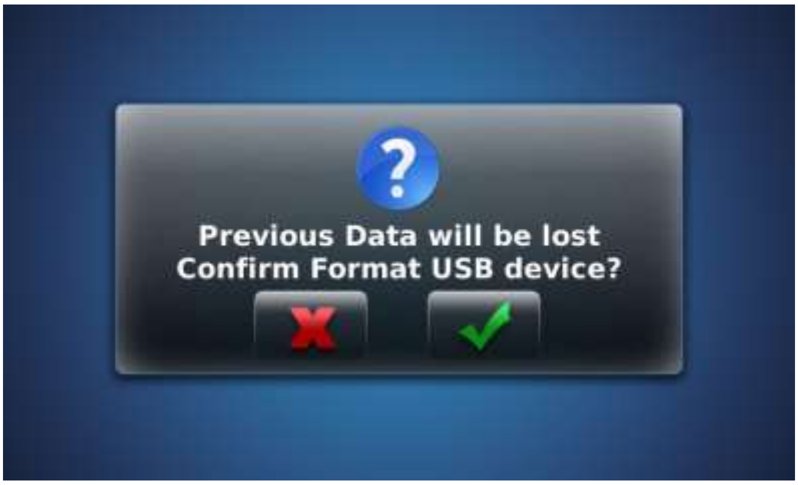


Figure 229: Formatting USB Mass Storage device

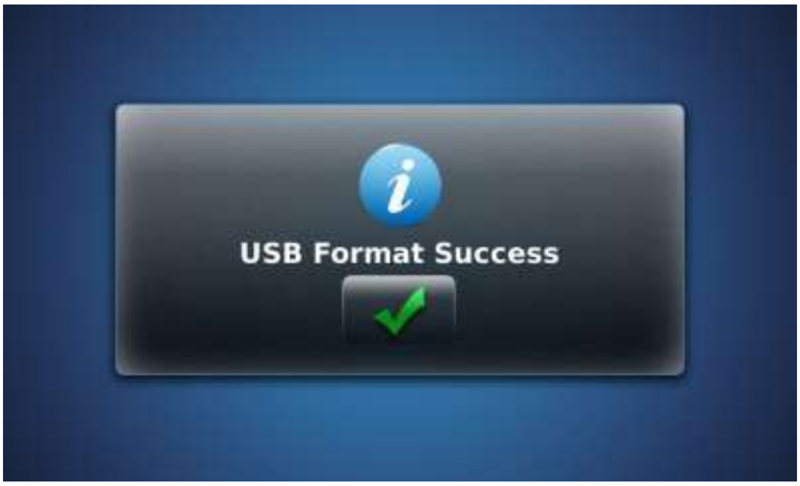
1. Connect USB Mass Storage device to terminal
2. Select **Format USB** option



Previous Data will be lost
Confirm Format USB device?

Figure 230: Confirmation message pop-up

3. A confirmation message pop-up is displayed, notifying that the previous data in the USB Mass Storage device will be lost.
4. Confirm action by using "✓" button



USB Format Success

Figure 231: Success Message of USB Mass Storage device Formatted

Results

A success message is displayed showing that the USB Mass Storage device is formatted. Now the USB Mass Storage device can be initialized and used for data exchange.

Import Data into Terminal

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is capable of importing several files in its local database. The administrator can import the following files to the terminal by using Import Data functionality:

- **User Database:** It is a general practice to maintain a backup of the user database, to prevent situations such as database loss. Using the Import data functionality, the backup file of the user database can be imported in the terminal.

- **Contactless key:** The administrator can import the contactless key. The terminal used the key to identify the card. Terminal can performe the card operation which is not encoded it self by importing the security key of the card.

- **Language File:** Terminal can support multiple languages. The administrator can customize and upload the language file in the terminal, by using Import Language file. The uploaded language will be displayed to the user to select from. See "*Language Configuration*" for more information.

  Note: The administrator can upload new font style using file_load() distant command. User information message like Access granted/Denied/Dynamic messages will be displayed in new font style once font file is uploaded into the terminal.

  Customized language will be displayed in the new font style, if new font is uploaded in to the terminal in addition to the customized language file.

- **Multimedia Files:** The administrator can import multimedia content such as Audio, Video and Images that are played on terminal upon the occurrence of specific events. Please refer to the "*Multimedia menu*" to learn as to how to import multimedia content.

Note: Import users in an empty terminal doesn't automatically turn on the fingerprint sensor. You have to reboot it.

Recommendation

Importing data into the terminal may take longer duration depending on the data size, which consequently affects the terminal response time and other operations. Hence the administrator is recommended to perform import data operation when the terminal is in idle state.

How to Import User Database

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Import	✓	✗

Pre-requisite

- USB Mass Storage device should be initialized and must have the user database file in the correct folder
- USB Mass Storage device should be plugged into the terminal

Screens & Steps

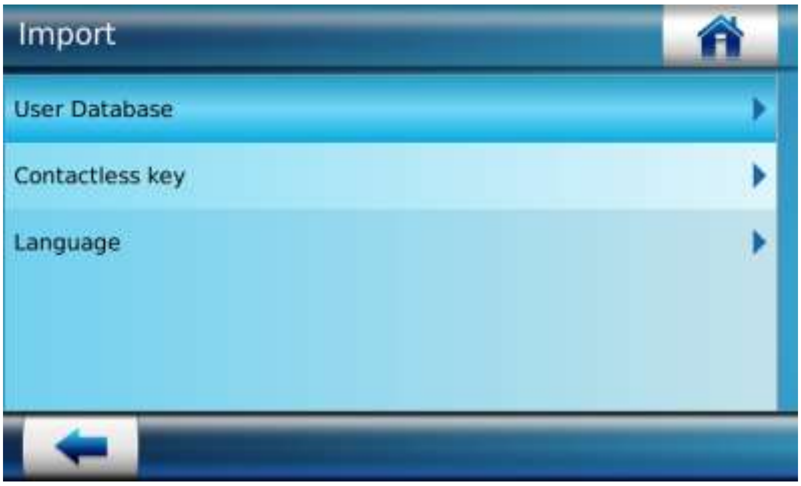
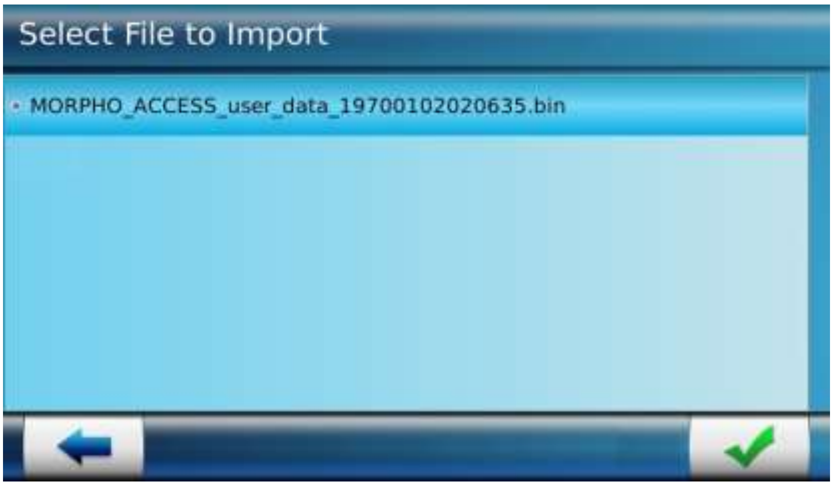


Figure 232: Importing User Database

1. Select **User Database**

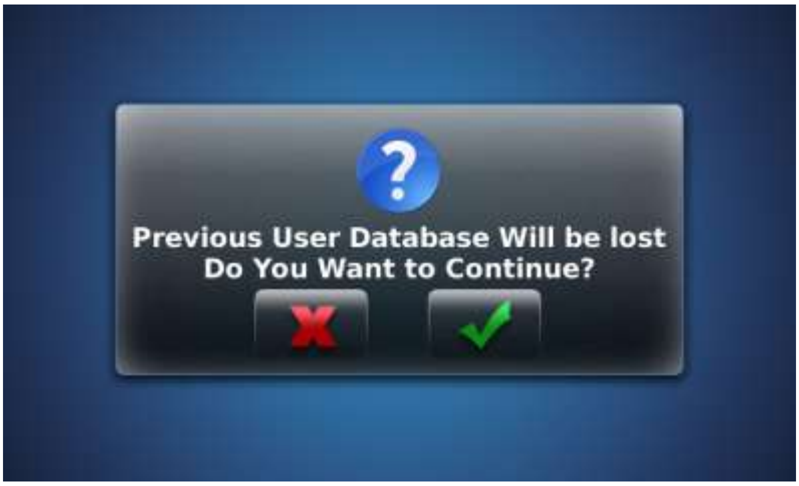


Select File to Import

- MORPHO_ACCESS_user_data_19700102020635.bin

Figure 233: Selecting file to be imported in the terminal

2. The list of files present in the user database folder in USB Mass Storage device is displayed
3. Select a file to be imported



Previous User Database Will be lost
Do You Want to Continue?

Figure 234: Confirmation message to import User Database

4. A confirmation message is displayed asking to confirm action. It also notifies that on importing file, the previous user database will be lost
5. Confirm by using "✓" button

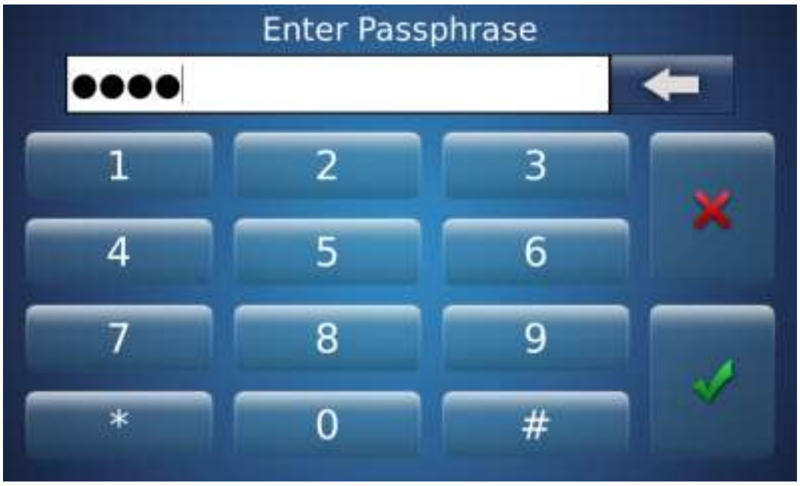
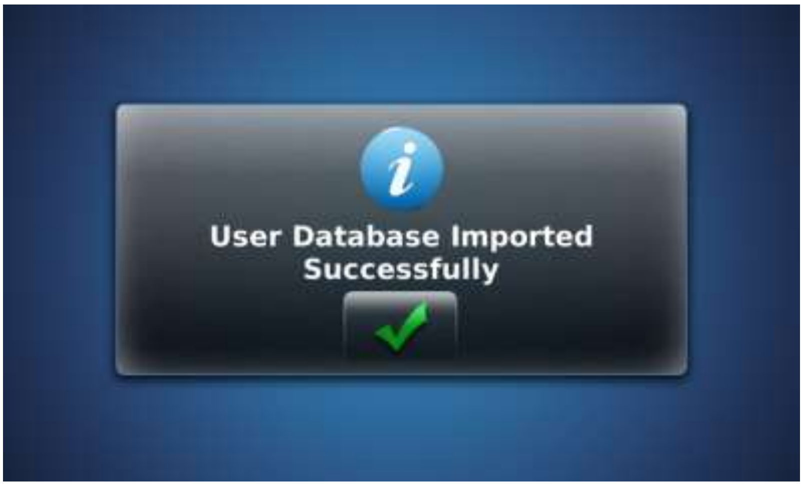


Figure 235: Enter password

6. Enter a **Passphrase**. The passphrase set at the time of exporting user database is required to be entered for importing the same user database file in terminal.
7. Use "✓" button to complete an action



User Database Imported Successfully

Figure 236: Success message of user data imported is displayed

Results

Once the user's database is imported, the user information can be edited and identification of users can be performed on the terminal.

How to Import Contactless key

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Import	✓	✗

Pre-requisite

- USB Mass Storage device should be initialized and must have the contactless key file in the correct folder
- USB Mass Storage device should be plugged into the terminal

Screens & Steps

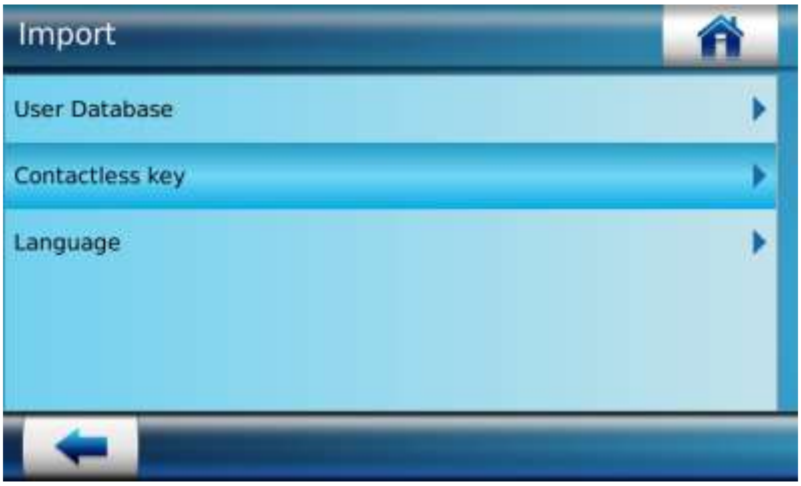


Figure 237: Importing contactless key

1. Select **Contactless key**

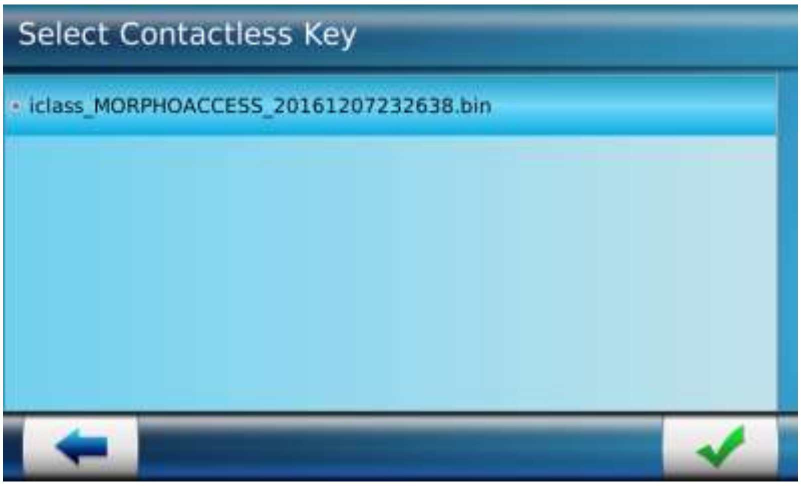


Figure 238: Selecting file to be imported in the terminal

2. The list of files present in the user database folder in USB Mass Storage device is displayed
3. Select a file to be imported

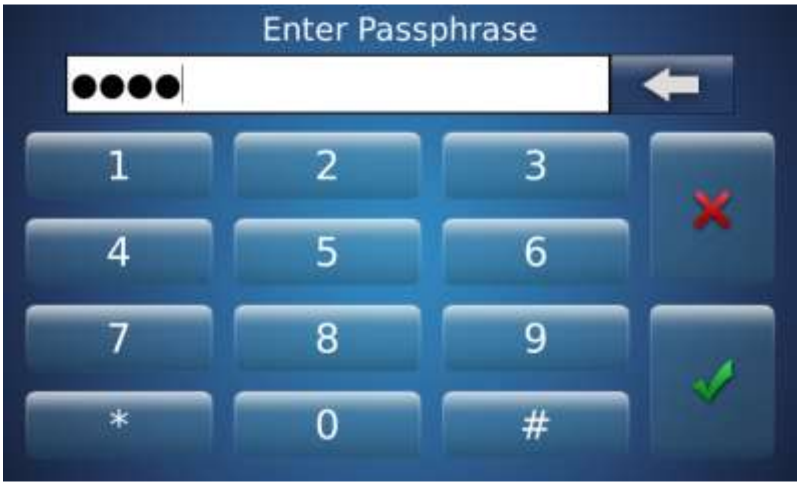
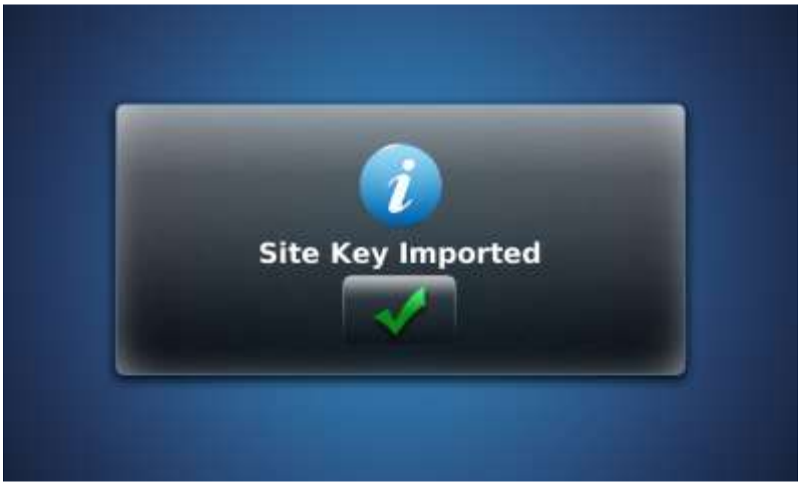


Figure 239: Enter password

4. Enter a **Passphrase**. The passphrase set at the time of exporting user database is required to be entered for importing the same user database file in terminal.
5. Use "✓" button to complete an action



Site Key Imported

Figure 240: Success message of contactless key imported is displayed

Results

Once the user's site key is imported, the card can be edit, erase and renew.

How to Import Language

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Import	✓	✗

Pre-requisite

- USB Mass Storage device should be initialized and must have the language file in the correct folder
- USB Mass Storage device should be plugged into the terminal

Screens & Steps

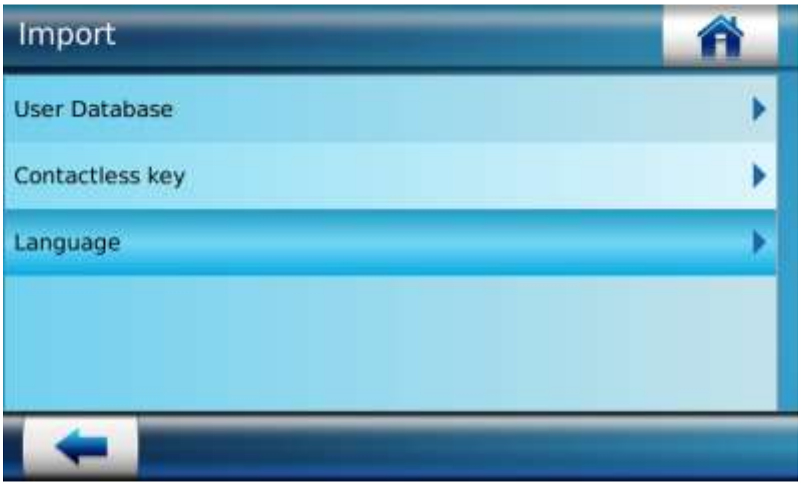


Figure 241: Importing Language file

1. Select **Language** to be imported

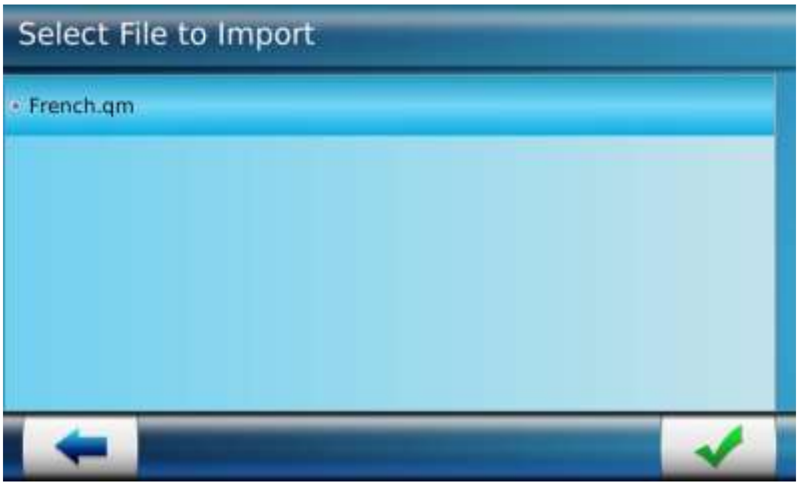
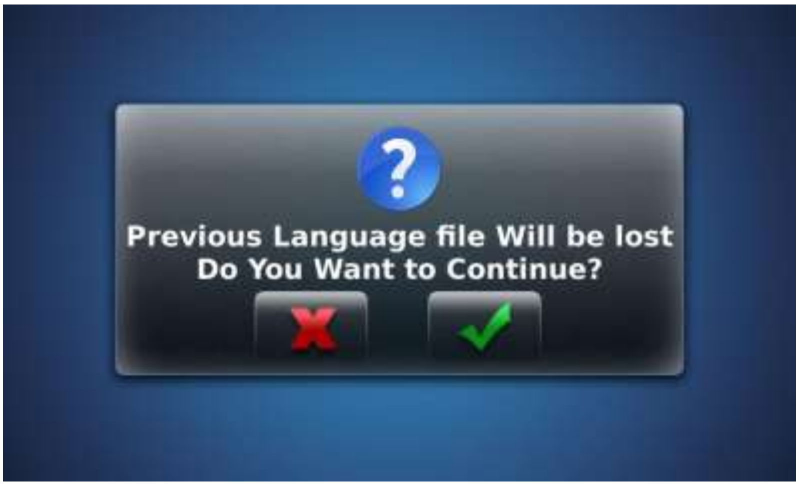


Figure 242: Selecting Language file to import

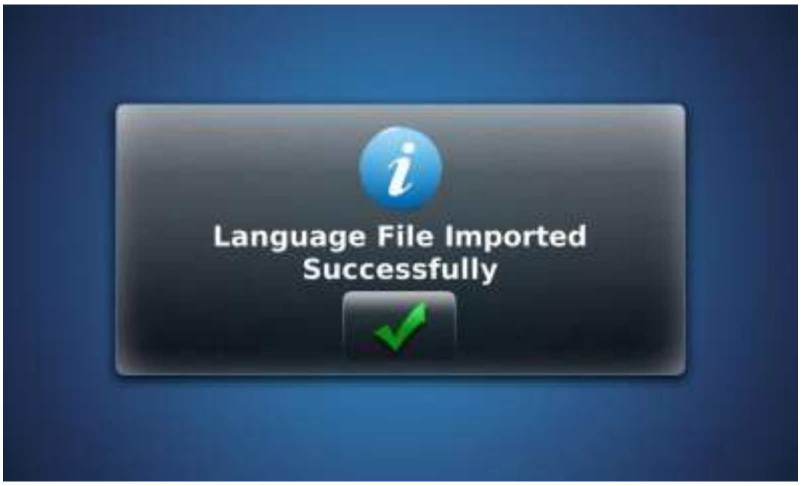
2. The language files present in USB Mass Storage device is displayed. The language file will be in '.qm' format
3. Select a language file that is required to be uploaded
4. Press on check box "✓".



Previous Language file Will be lost
Do You Want to Continue?

Figure 243: Confirm import action

5. A confirmation message is displayed as a pop-up, select the check box to confirm import of language file. This action will replace the previous language file with the new file



Language File Imported
Successfully

Figure 244: A success message is displayed showing language file is imported

Export Data in USB Mass Storage Device

The administrator can export the information from terminal database into the USB Mass Storage Device, by using this functionality. The terminal allows the export of the following categories of data.

- **Transaction Logs:** there can be two modes of transaction logging,
- **Error Logs:** Contains the record of failed attempts to access as well as other errors that have occurred
- **User Database:** This contains user database.
- **Contactless key:** This contains the contactless card security keys

The logs and user database can be exported in Binary (.bin) format, which is a non-readable file. Transaction log can also be exported in .CSV format.

The data exported in USB Mass Storage device can be used as a backup and imported in the terminal, on instances when terminal database is formatted.

Recommendation

Exporting data from the terminal may take longer duration depending on the data size. This consequently affects the terminal response time and other operations. Hence the administrator is recommended to perform export data operation when terminal is in idle state.

How to Export & View Transaction Logs

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Export > Transaction Logs	✓	✗

Pre-requisites

- The administrator must enable the Transaction Logging Mode for the transaction logs to be recorded in the terminal

Screens & Steps

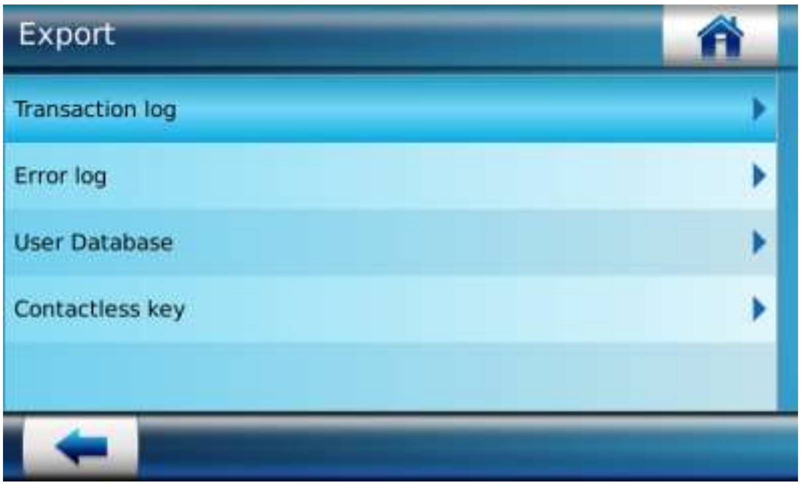


Figure 245: Exporting transaction logs into USB Mass Storage Device

1. Select the **Transaction log** option.

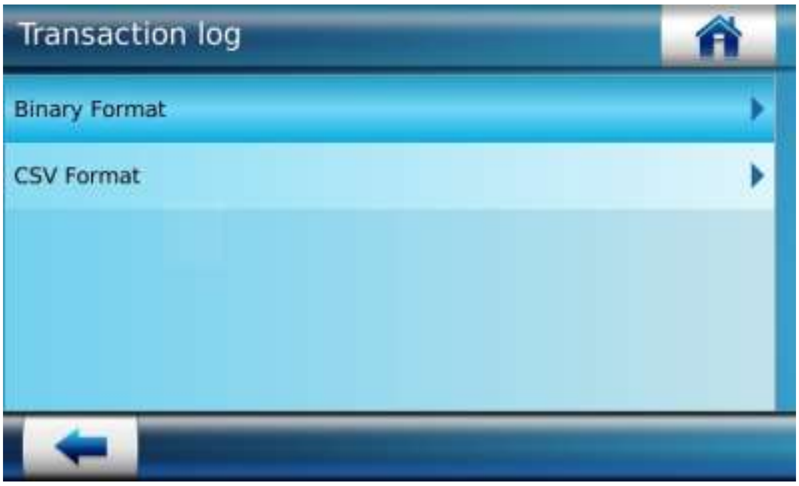


Figure 246: Selecting a file format for exporting transaction logs

2. Select the format in which data should be exported in, such as **Binary Format** or **CSV Format**

NOTE: Only Transaction Log has option to be exported in .bin or .csv format. Error logs and User database is exported in encrypted format by default.

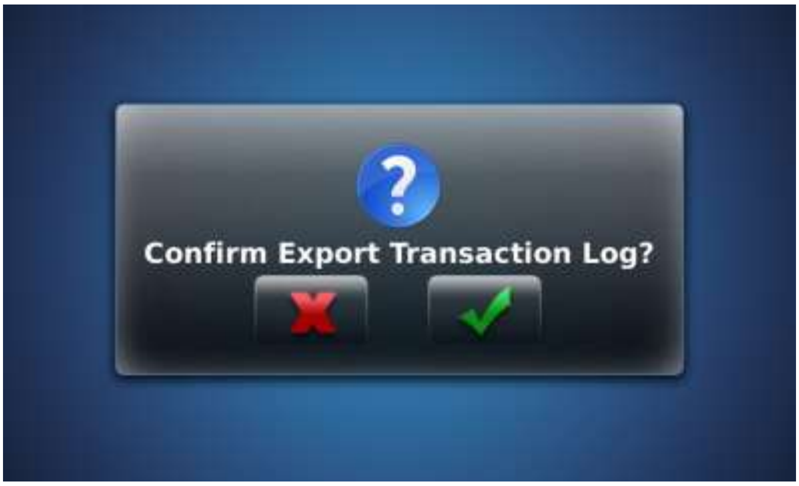
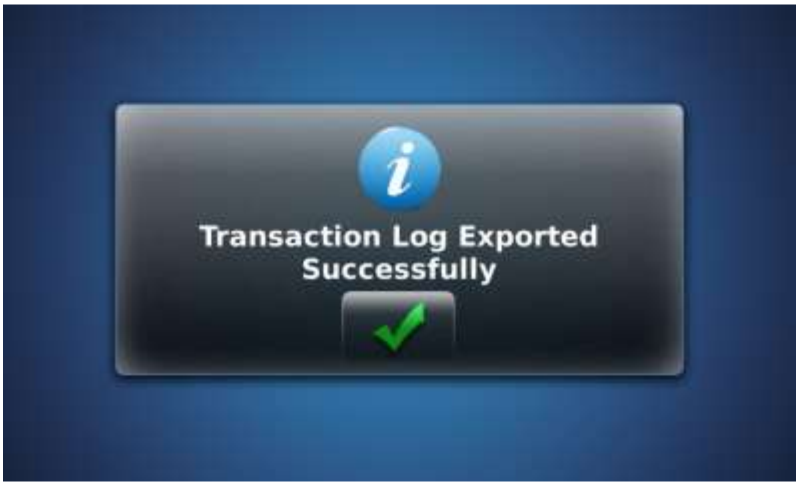


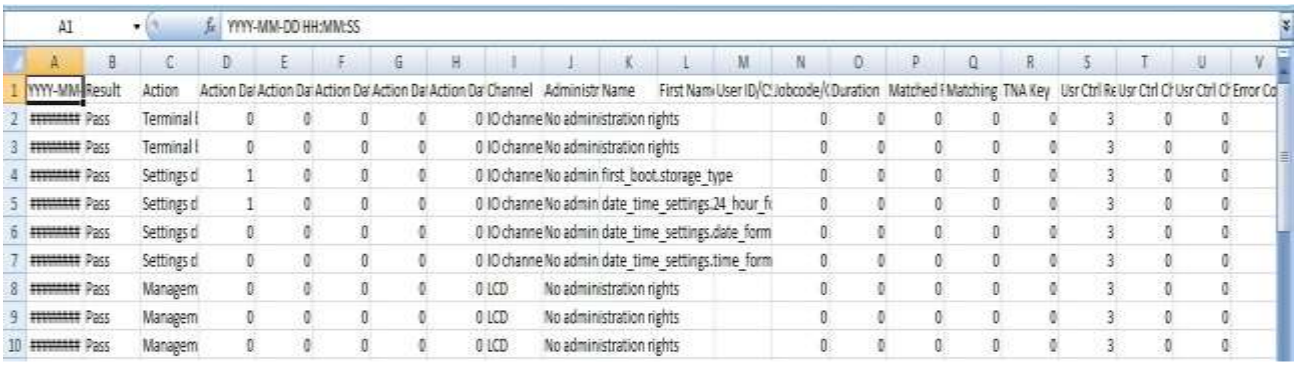
Figure 247: A confirmation message pop-up

3. A confirmation message pop-up is displayed
4. Confirm an action to export log by using "✓" button



Transaction Log Exported Successfully

Figure 248: A success message is displayed showing transaction log is exported



A1 fx YYYY-MM-DD HH:MM:SS

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	YYYY-MM-	Result	Action	Action Da	Action Da	Action Da	Action Da	Action Da	Channel	Administr	Name	First Nam	User ID/C	Jobcode/	Duration	Matched F	Matching	TNA Key	Usr Ctrl Re	Usr Ctrl C	Usr Ctrl C	Error Co
2	########	Pass	Terminal l	0	0	0	0	0	IO channe	No administration rights				0	0	0	0	0	3	0	0	
3	########	Pass	Terminal l	0	0	0	0	0	IO channe	No administration rights				0	0	0	0	0	3	0	0	
4	########	Pass	Settings d	1	0	0	0	0	IO channe	No admin	first_boot.storage_type			0	0	0	0	0	3	0	0	
5	########	Pass	Settings d	1	0	0	0	0	IO channe	No admin	date_time_settings.24_hour_fo			0	0	0	0	0	3	0	0	
6	########	Pass	Settings d	0	0	0	0	0	IO channe	No admin	date_time_settings.date_form			0	0	0	0	0	3	0	0	
7	########	Pass	Settings d	0	0	0	0	0	IO channe	No admin	date_time_settings.time_form			0	0	0	0	0	3	0	0	
8	########	Pass	Managem	0	0	0	0	0	LCD	No administration rights				0	0	0	0	0	3	0	0	
9	########	Pass	Managem	0	0	0	0	0	LCD	No administration rights				0	0	0	0	0	3	0	0	
10	########	Pass	Managem	0	0	0	0	0	LCD	No administration rights				0	0	0	0	0	3	0	0	

Figure 249: Transaction Log in .CSV Format Sample

Results

The file for the exported transaction logs is created and stored in the USB Mass Storage Device, in .csv format.

How to Export Error Logs

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Export > Error Log	✓	✗

Pre-requisites

- The administrator must explicitly enable the Error Logging. Refer to "*Error Log Configuration*" for more information about error log configuration

Screens & Steps

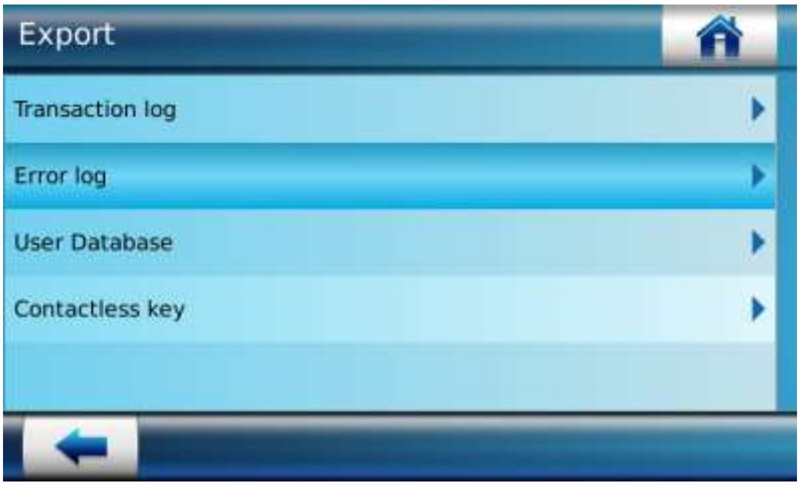
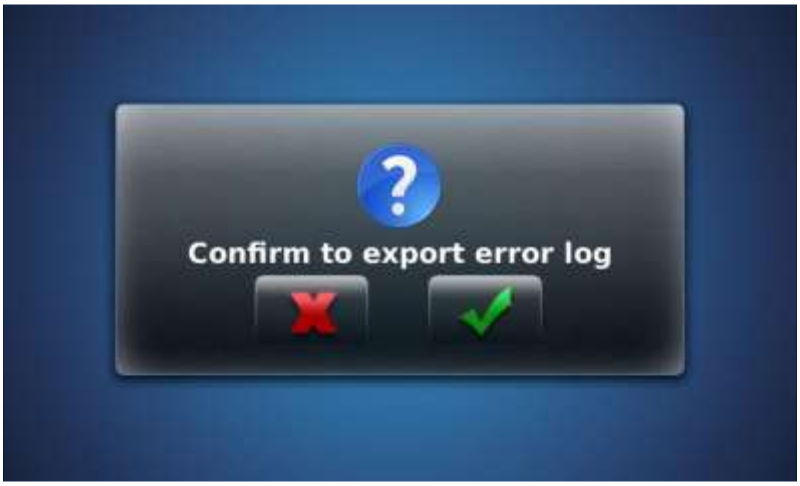


Figure 250: Exporting data into USB Mass Storage Device

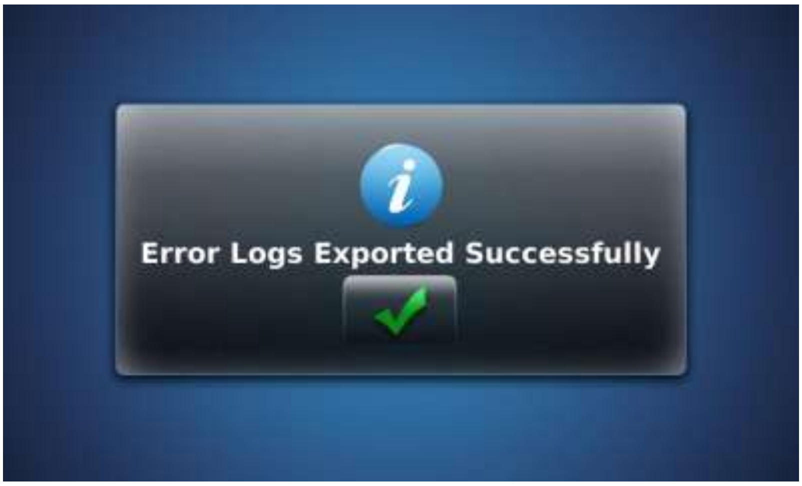
1. Select the **Error log** option.



Confirm to export error log

Figure 251: A confirmation message pop-up

2. A confirmation message pop-up is displayed
3. Confirm an action to export log by using "✓" button



Error Logs Exported Successfully

Figure 252: A success message is displayed showing error log is exported

Results

The file for the exported error logs is created and stored in the USB Mass Storage Device, in .tar format. The file is encrypted and non-readable, for security purpose.

How to Export User Database

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Export > User Database	✓	✗

Screens & Steps

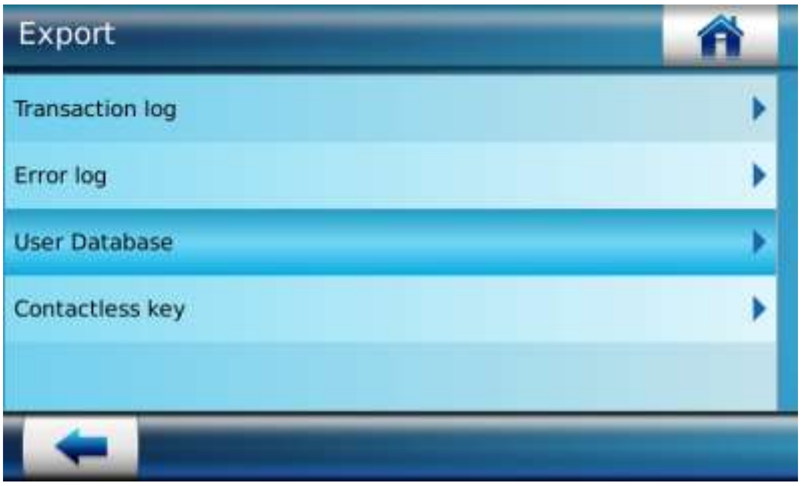
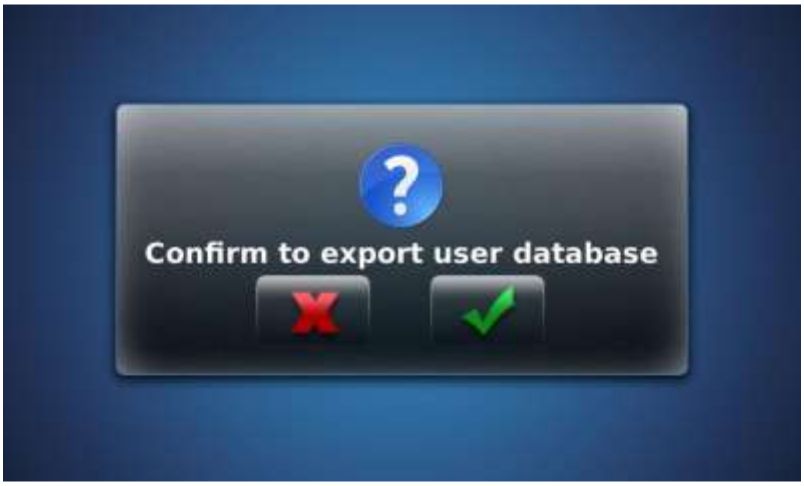


Figure 253: Exporting data into USB Mass Storage Device

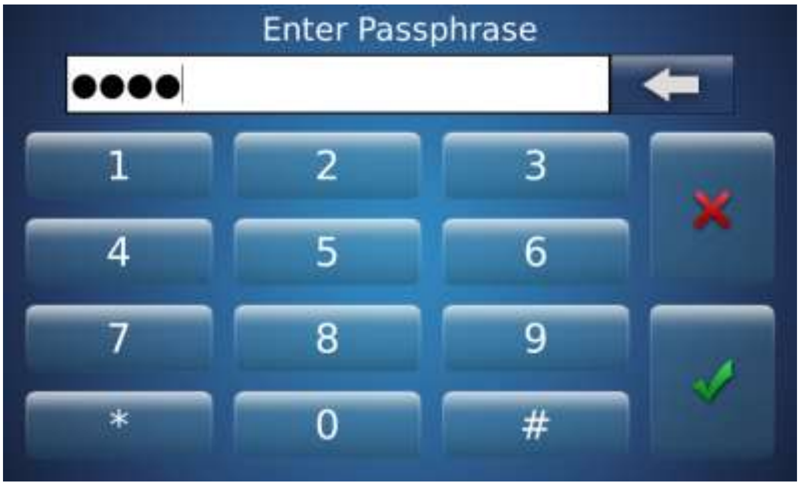
1. Select the **User Database** option.



Confirm to export user database

Figure 254: A confirmation message pop-up

2. A confirmation message pop-up is displayed
3. Confirm an action to export database by pressing“✓” button

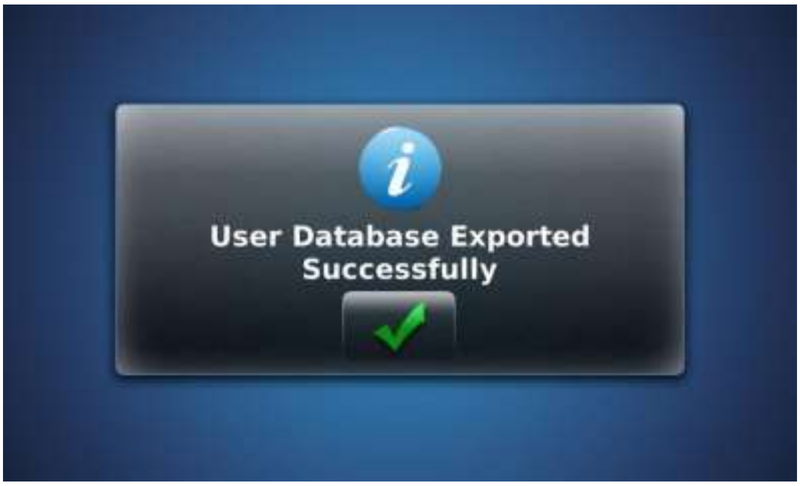


Enter Passphrase

●●●●

Figure 255: Enter Passphrase

4. Enter **Passphrase**. The same passphrase will be required on importing the user database in terminal
5. Press on “✓” button



User Database Exported Successfully

Figure 256: A success message is displayed showing error log is exported

Results

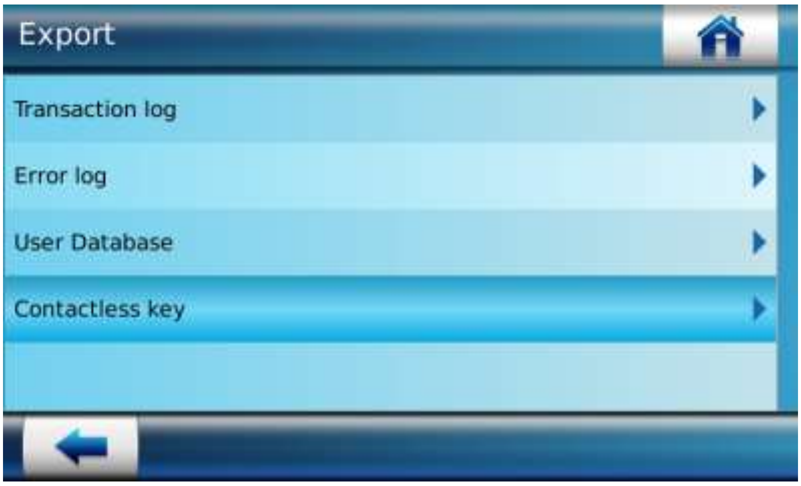
The file for the user database is created in .BIN format and stored in the USB Mass Storage Device. The file is encrypted and non-readable, for security purpose.

How to Export Contactless key

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	USB Menu > Export > Contactless key	✓	✗

Screens & Steps



Export

Transaction log

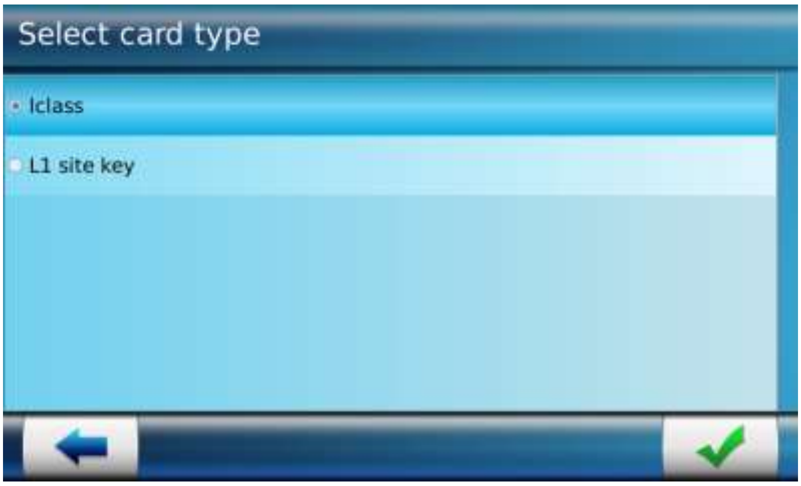
Error log

User Database

Contactless key

Figure 257: Exporting data into USB Mass Storage Device

1. Select the **Contactless key** option.
2. Select the key you want to export and press "✓" button.



Select card type

● Iclass

○ L1 site key

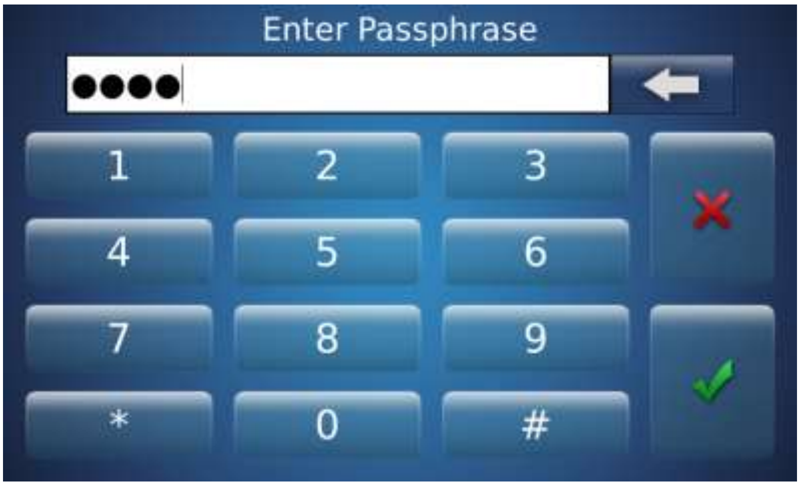


Figure 258: Enter Passphrase

3. Enter **Passphrase**. The same passphrase will be required on importing the user contactless key in terminal
4. Press on "✓" button

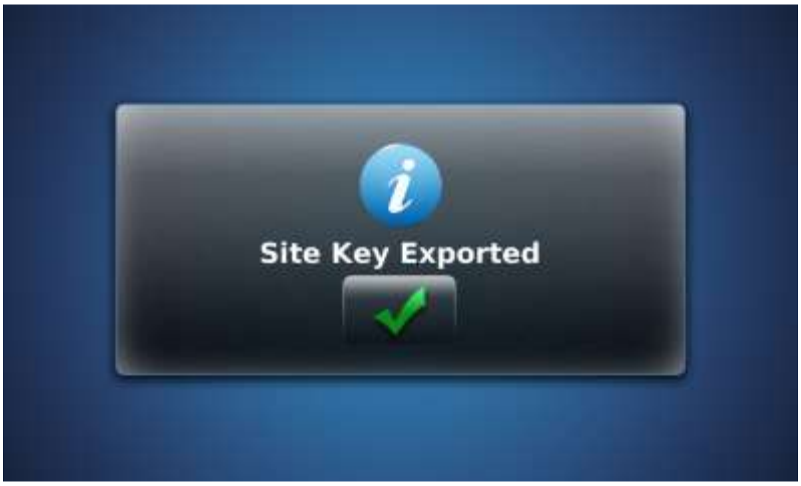

Site Key Exported

Figure 259: A success message is displayed showing error log is exported

Results

The file for the contactless key is created in .BIN format and stored in the USB Mass Storage Device. The file is encrypted and non-readable, for security purpose.

Information Menu

The administrator can view important data such as the ones listed below, from a single panel. This can be achieved by means of the Information Menu.

- Information related to Terminal's commercial name and license
- Sensor Information
- Firmware version
- Network settings done in terminal, that includes Ethernet, Wi-Fi™, Serial Channel, 3G, GSM, and GPRS connections
- Memory Status of the terminal
- User Status, showing count of enrolled, authorized and VIP users. Also shows maximum capacity of users supported on the terminal
- Transaction Log Status shows count of current logs and maximum log records supported on the terminal

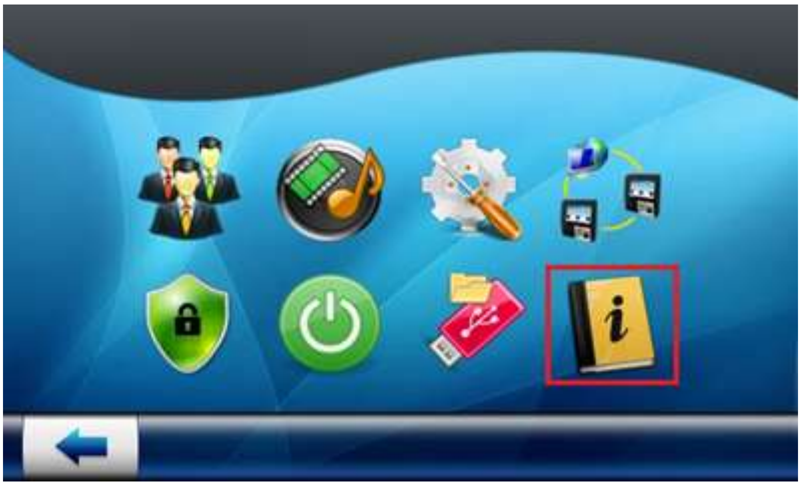


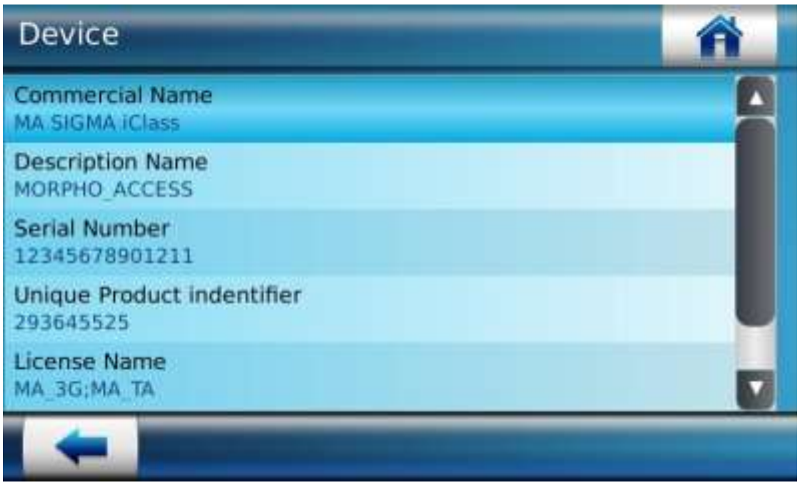
Figure 260: Information Menu

View Device Details

The administrator can view the information related to the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, by using this functionality.

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series	SIGMA Lite+ Series
Terminal Menu	Information Menu > Terminal	✓	✗	✓
Webserver	Webserver > Terminal Info	✓	✓	✓

Screens & Steps


Device

Commercial Name
MA SIGMA iClass

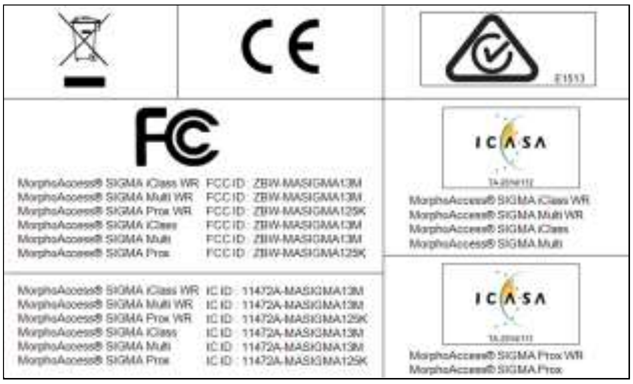
Description Name
MORPHO_ACCESS

Serial Number
12345678901211

Unique Product indentifier
293645525

License Name
MA_3G;MA_TA

Figure 261: View Device Information


E1513

MorphoAccess® SIGMA iClass WR FCC ID : ZBW-MASIGMA13M
MorphoAccess® SIGMA Multi WR FCC ID : ZBW-MASIGMA13M
MorphoAccess® SIGMA Prox WR FCC ID : ZBW-MASIGMA125K
MorphoAccess® SIGMA iClass FCC ID : ZBW-MASIGMA13M
MorphoAccess® SIGMA Multi FCC ID : ZBW-MASIGMA13M
MorphoAccess® SIGMA Prox FCC ID : ZBW-MASIGMA125K

MorphoAccess® SIGMA iClass WR IC ID : 11472A-MASIGMA13M
MorphoAccess® SIGMA Multi WR IC ID : 11472A-MASIGMA13M
MorphoAccess® SIGMA Prox WR IC ID : 11472A-MASIGMA125K
MorphoAccess® SIGMA iClass IC ID : 11472A-MASIGMA13M
MorphoAccess® SIGMA Multi IC ID : 11472A-MASIGMA13M
MorphoAccess® SIGMA Prox IC ID : 11472A-MASIGMA125K

ICASA
TA-2016/112
MorphoAccess® SIGMA iClass WR
MorphoAccess® SIGMA Multi WR
MorphoAccess® SIGMA iClass
MorphoAccess® SIGMA Multi

ICASA
TA-2016/111
MorphoAccess® SIGMA Prox WR
MorphoAccess® SIGMA Prox

Figure 262: View Device Regulatory Information

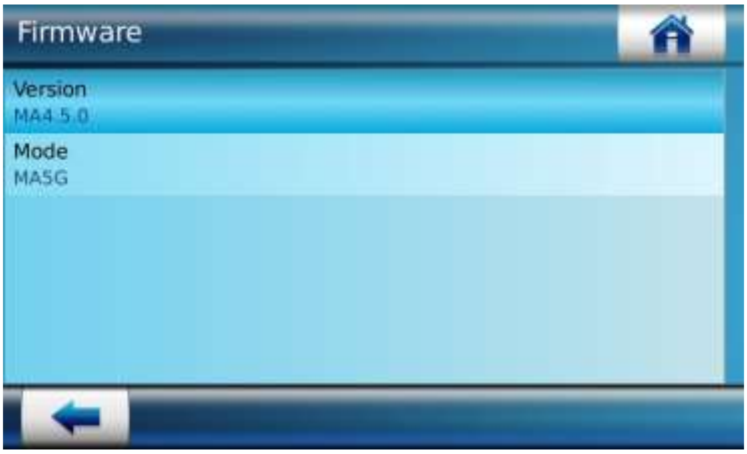
1. Following information of the terminal are displayed:
    a. **Device Commercial Name**
    b. **Device Description Name**
    c. **Device Serial Number**
    d. **Device Unique Product identifier**
    e. **License Name**
    f. **License Identifier**
    g. **Regulatory Information**

View Firmware Information

The administrator can view information regarding the current version of the Terminal firmware by using this functionality. The firmware version is upgradeable.

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series	SIGMA Lite+ Series
Terminal Menu	Information Menu > Terminal > Firmware Version	✓	✗	✓
Webserver	Webserver > Terminal Info	✓	✓	✓

Screens & Steps

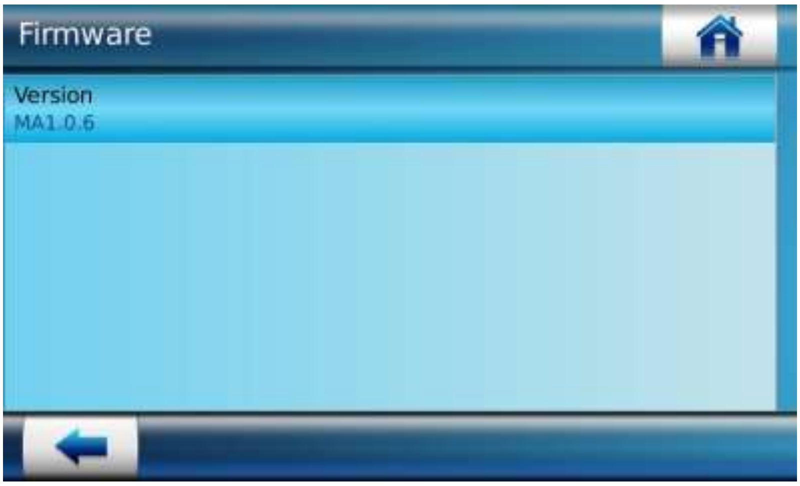

Firmware

Version
MA4.5.0

Mode
MA5G

Figure 263: MorphoAccess® SIGMA Family Version information

1. The current terminal firmware version information is displayed
2. The current terminal protocol information is displayed



Firmware

Version
MA1.0.6

Figure 264: *MorphoWave®* Compact terminal Firmware Version information

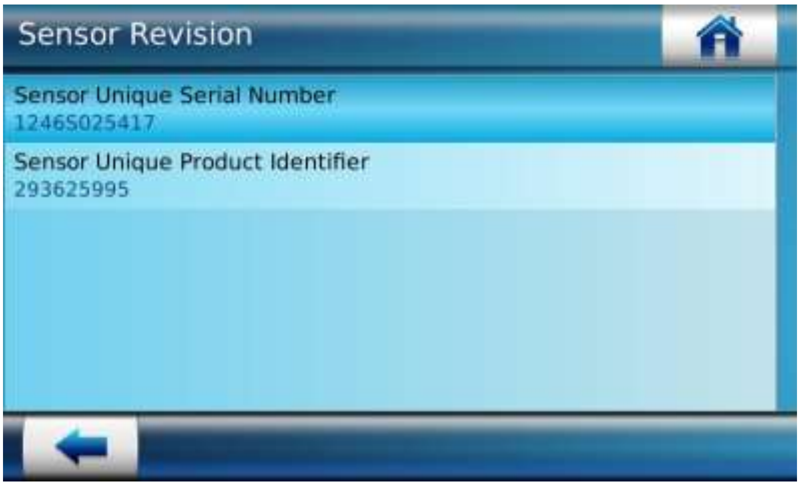
1. The current terminal firmware version information is displayed

View Sensor Revision Information

The administrator can view the information related to the biometric sensor, by using this functionality.

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Information Menu > Sensor Revision	✓	✗
Webserver	Terminal Info > Terminal	✓	✓

Screens & Steps



Sensor Revision

Sensor Unique Serial Number
12465025417

Sensor Unique Product Identifier
293625995

Figure 265: Biometric Sensor data

1. **Sensor Unique Serial Number**
2. **Sensor Unique Product Identifier** is displayed

View Communication Parameters

The administrator can view the information of various Networks interface through which the terminal is connected with distant systems, Under **Communication** tab.

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series	SIGMA Lite+ Series
Terminal Menu	Information Menu > Communication	✓	✗	✓
Webserver	Terminal Settings > Communication > IPv4/IPv6 Network	✓	✓	✓

Screens & Steps

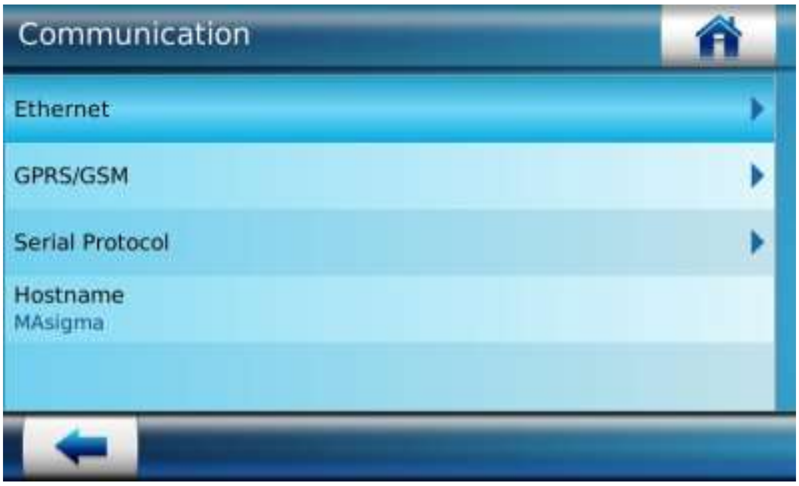
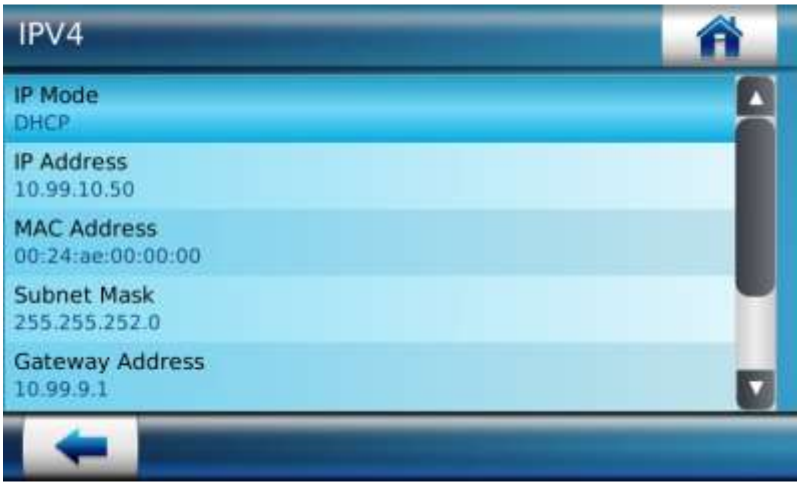


Figure 266: Selecting communication network

1. Select the type of communication network from the following options:
   a. Ethernet
   b. GPRS/GSM
   c. Serial Protocol
   d. Hostname



IPV4

IP Mode
DHCP

IP Address
10.99.10.50

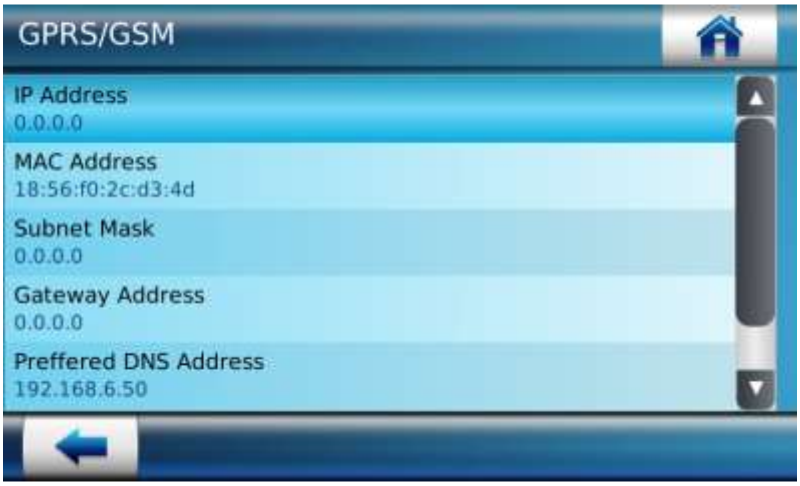
MAC Address
00:24:ae:00:00:00

Subnet Mask
255.255.252.0

Gateway Address
10.99.9.1

Figure 267: Viewing information of Ethernet network

2. Under Ethernet, select **IPV4** or **IPV6**
3. Following information is displayed, of an IP connection:
    a. **IP Mode** i.e. Static or DHCP
    b. **IP Address** of the terminal
    c. **MAC Address** of the terminal
    d. **Subnet Mask**
    e. **Gateway Address**
    f. **Preferred DNS Address**
    g. **Alternate DNS Address**



GPRS/GSM

IP Address
0.0.0.0

MAC Address
18:56:f0:2c:d3:4d

Subnet Mask
0.0.0.0

Gateway Address
0.0.0.0

Preffered DNS Address
192.168.6.50

Figure 268: Viewing information of GPRS/GSM network

4. Following information of GPRS/GSM connection is displayed:

a. **IP Address** of the terminal

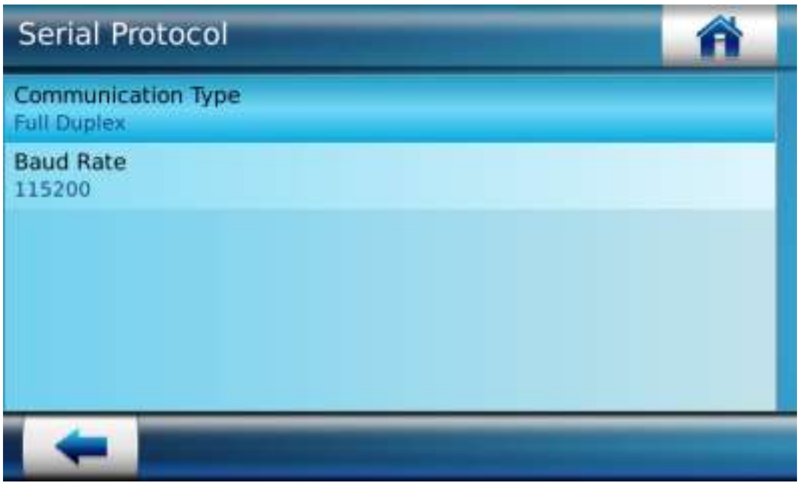
b. **MAC Address** of the terminal

c. **Subnet Mask**

d. **Gateway Address**

e. **Preferred DNS Address**

f. **Alternate DNS Address**



Serial Protocol

Communication Type
Full Duplex

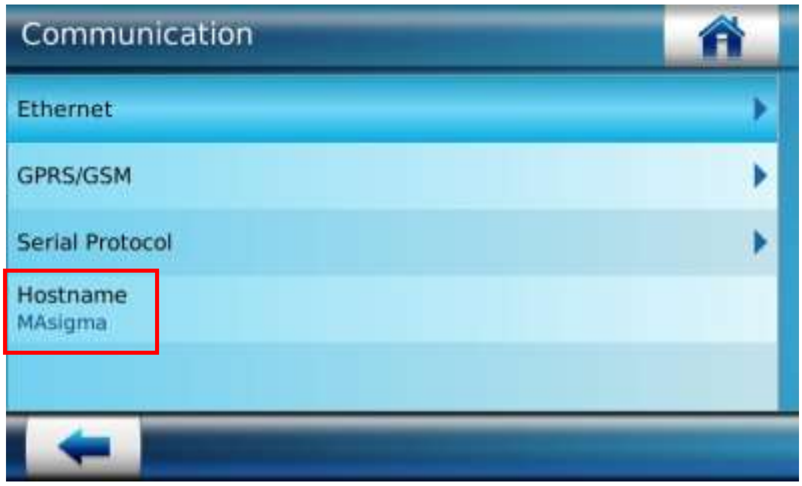
Baud Rate
115200

Figure 269: Viewing Serial Protocol Configuration

5. If terminal is communicating with distant server using serial port, then parameters listed below are displayed:

    a. **Communication Type** i.e. Half Duplex or Full Duplex

    b. **Baud Rate** i.e. data transmission rate through serial port



Communication

Hostname
MAsigma

Figure 270: View Hostname of the terminal

6. Hostname of the terminal is displayed

View Memory Status

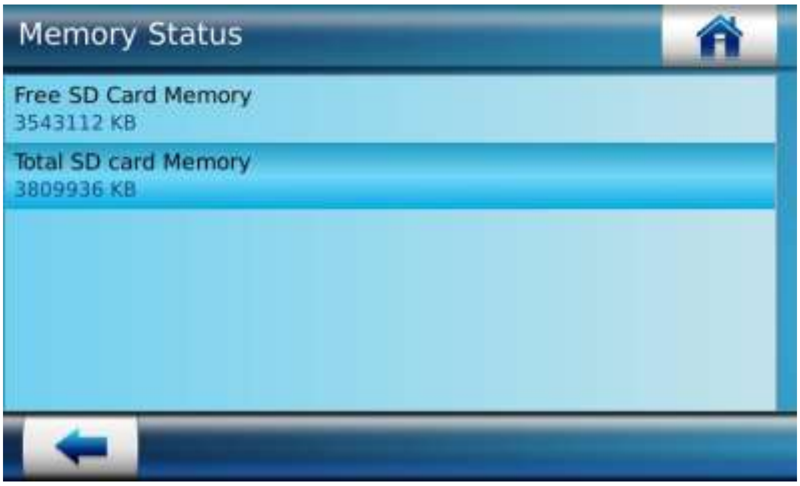
The administrator can view the remaining memory of the terminal, by using this functionality.

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Information Menu > Memory Status	✓	✗
Webserver	Terminal Info > SD Card Information	✓	✗

Pre-requisites

- The administrator must have the SD card plugged in the terminal

Screens & Steps



Memory Status

Free SD Card Memory
3543112 KB

Total SD card Memory
3809936 KB

Figure 271: Memory Status of the device is displayed

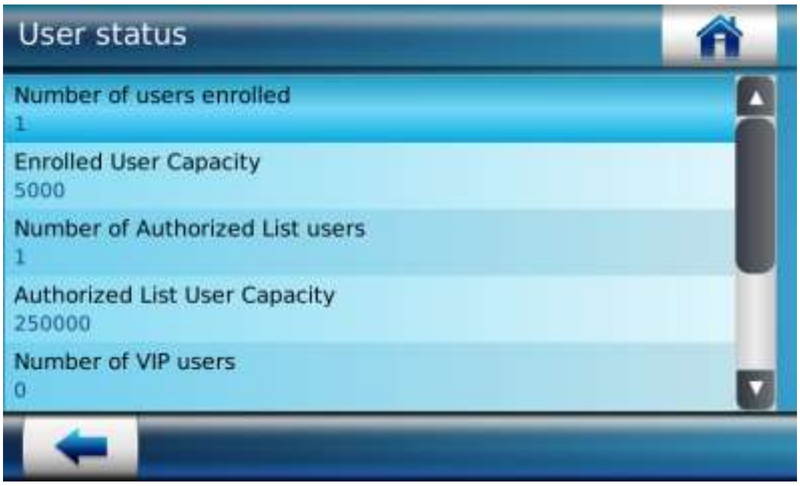
1. Following information is displayed under Memory State:
   a. Free SD card Memory
   b. Total SD card Memory

View User Status

The administrator can view the summary of number of enrolled users, number of authorized listed users and number of VIP users by following the **View User Status** tab.

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Information Menu > View User Status	✓	✗
Webserver	Terminal Info > User's Information	✓	✓

Screens & Steps


User status

Number of users enrolled
1

Enrolled User Capacity
5000

Number of Authorized List users
1

Authorized List User Capacity
250000

Number of VIP users
0

Figure 272: View User Status

Under User Status information section, following information is displayed:

1. **Number of Users Enrolled** in the terminal is displayed
2. **Enrolled user Capacity** indicates the maximum number of users that can be enrolled. Basic capacity of the terminal is to store 5,000 users' database. The administrator can step up this capacity to 100,000 user's records, by installing users' license. Refer to "*User licenses*" for more information.
3. **Number of Authorized List Users,** the number of users enrolled as Authorized listed users

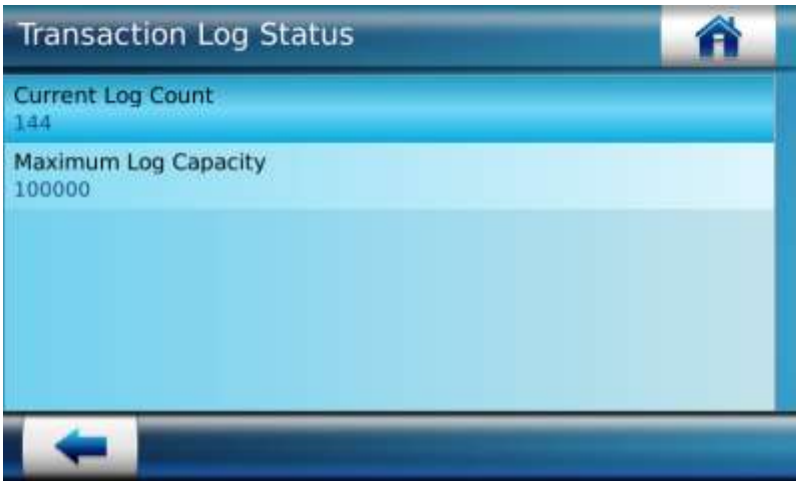
4. **Authorized List User Capacity** indicates the maximum number of users that can be added in the authorized list. This is 250,000 users by default.
5. **Number of VIP users**, the number of users enrolled as VIP users. Read more on “Access Control Process for VIP Users”
6. **Maximum VIP user capacity** indicates the maximum capacity of the users that can be enrolled as VIP users. By default the number of VIP users is 100.

View Transaction Log Status

The administrator can view the Transaction log status, by following the access path mentioned below. It displays the number of current logs recorded in the terminal database as well as the maximum capacity of logs that can be stored in the terminal.

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Information Menu > Transaction Log Status	✓	✗
Webserver	Terminal Info > Transaction Log Information	✓	✓

Screens & Steps



Transaction Log Status

Current Log Count
144

Maximum Log Capacity
100000

Figure 273: Transaction Log Status is displayed

1. **Current Log Count** stored in terminal is displayed
2. **Maximum Log Capacity**, the maximum number of transaction logs that can be stored in terminal is displayed

Reboot Terminal

Reboot of Terminal is performed to restart the terminal (soft restart). Reboot is required in following scenarios:

- Change Smart card Read Profile
- Installation of Wi-Fi™ USB Adapter
- Import of User database
- Enable Support L1 Cards
- Enable or disable the user binary ID
- Modify level of diagnostic logs
- Change the transaction log mode
- After installation of a new license that upgrades the terminal features

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	Home Screen	✓	✗
Webserver	Webserver Home Screen > Welcome Admin	✓	✓

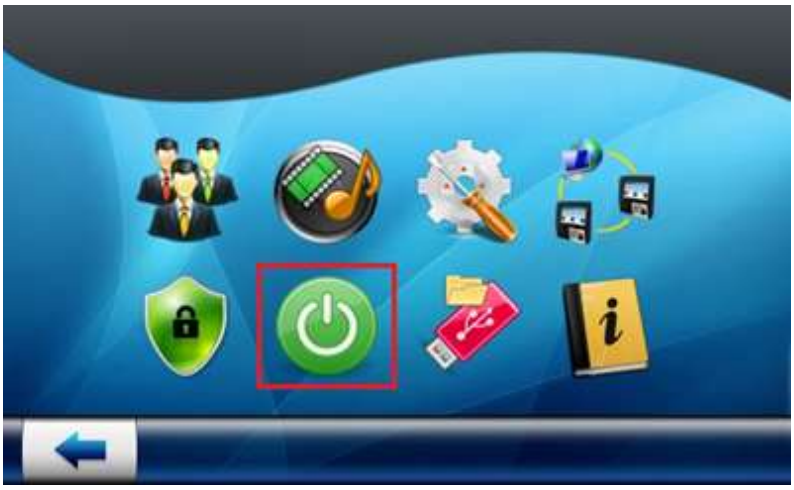


Figure 274: Reboot Device

After reboot all the settings are unchanged. If the administrator needs to reset the terminal to default factory settings, please use the corresponding function “**Erreur ! Source du renvoi introuvable.**”.

NOTE: *By pressing on the home icon at the top right end of the terminal, user can return to the home screen from any of the management menu screens. When user presses the home icon, a warning message first appears seeking confirmation. The user can confirm to return to the home screen by pressing “✓” button. By pressing button”✗“, the user can stay in the current screen to validate changes.*

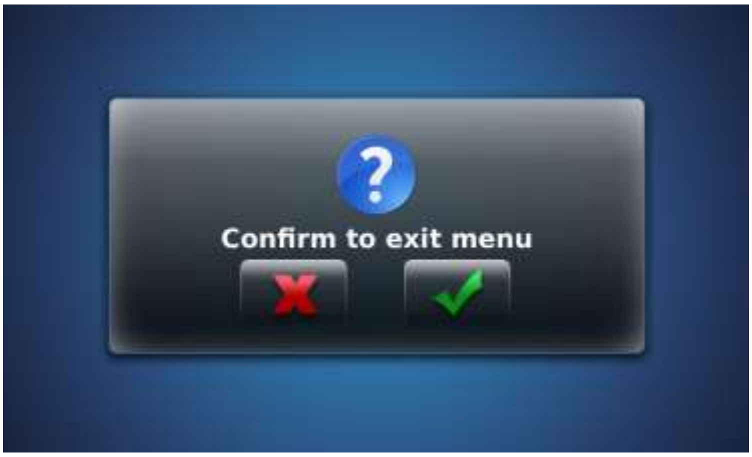


Figure 275: Confirmation Message To Return to Home Screen

Section 6 : **Terminal Videophone /Audiophone Facility**

Introduction to Videophone

MorphoAccess® SIGMA and SIGMA Extreme Series terminal provides a Videophone feature which allows a user to initiate a video call by pressing an icon on the main screen of the terminal. *MorphoWave®* Compact provides an audiophone feature without video.

This feature requires a Videophone server which is a PC with a VOIP client application using SIP protocol, such as Linphone.

This feature is useful for users to call access control administrator for help using the terminal, or to allow the administrator to check his face, a police badge, or any item which can be checked by video.

The diagram below show a typical use of this feature:

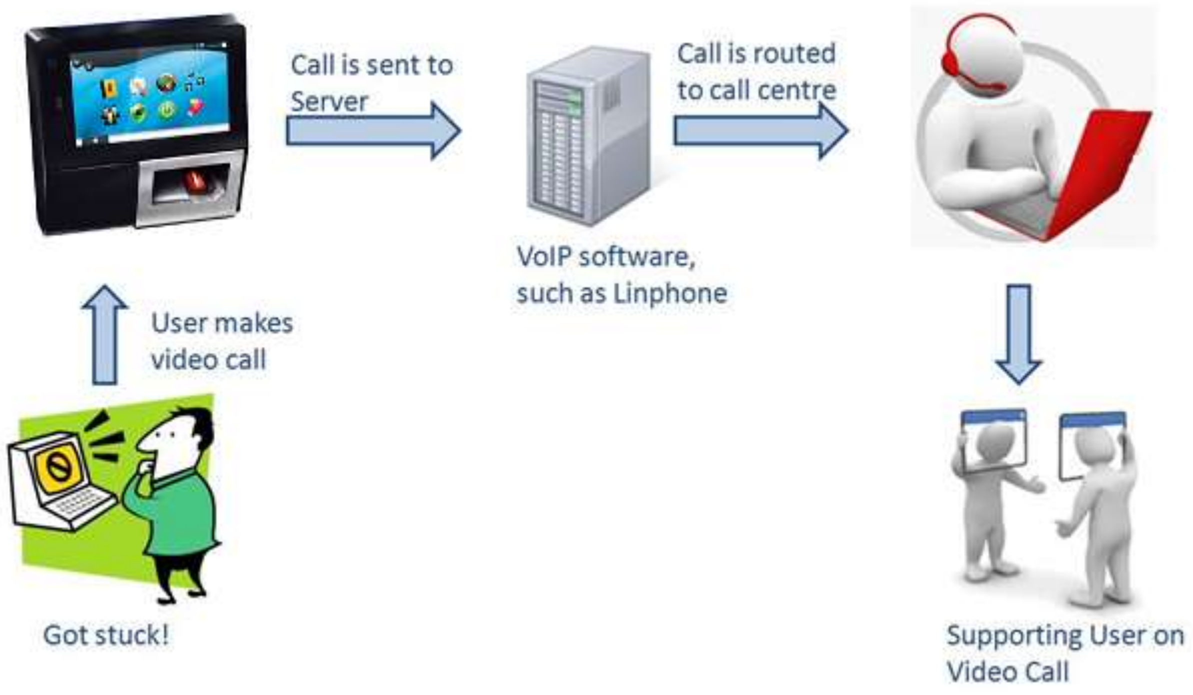

Call is sent to Server
Call is routed to call centre
VoIP software, such as Linphone
User makes video call
Got stuck!
Supporting User on Video Call

Figure 276: Video Phone Call Flow Diagram sample

For more information about Linphone, please visit Linphone web site at http://www.linphone.org/.

Configure Video Phone / Audio Phone Server

In order to make a video/audio phone call, it is a pre-requisite for the terminal to connect to computer based software, which can route the video call to the call center. Thus, the administrator needs to configure the server parameters, on which VoIP client application is installed. These servers are named as video phone servers.

An administrator can configure several video phone servers using **Add** functionality.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > Video Phone Configuration	✓	✗
Webserver	MMI (Man-Machine Interface) > Video Phone Configuration	✓	✗

Pre-requisites

- Terminal can be connected with video phone servers only through Ethernet or Wi-Fi™ network

Screens & Steps

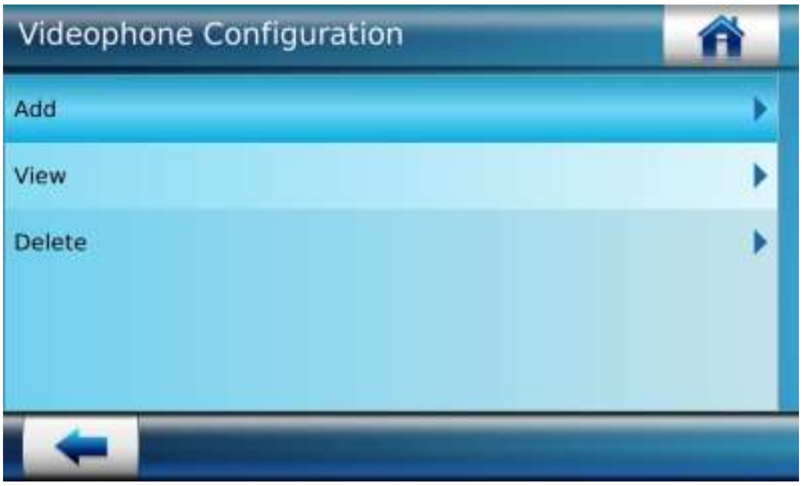
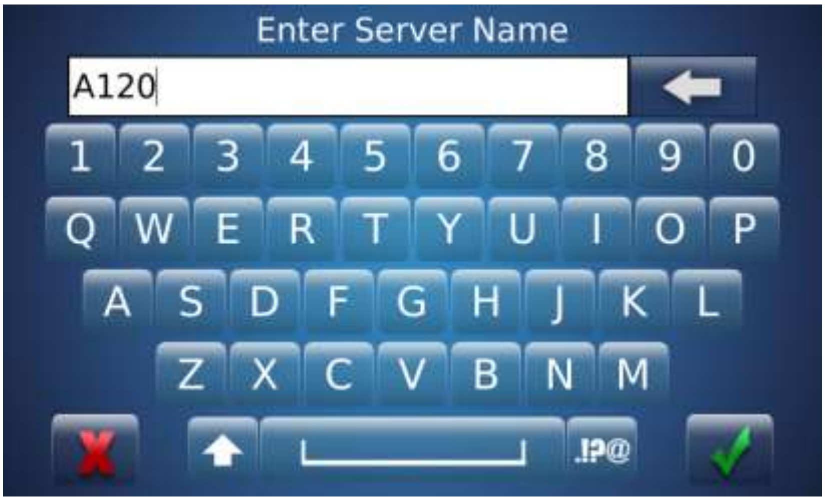


Figure 277: Adding a Server for Video Phone

1. Press on **Add** option for adding server with which video phone will be connected

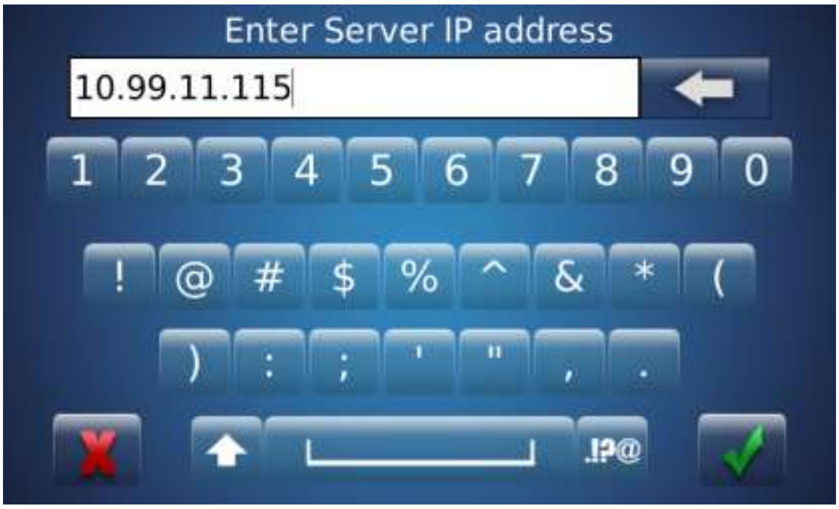


Enter Server Name

A120

Figure 278: Enter Server Name

2. Enter **Server Name**
3. Use "✓" button to move to next screen

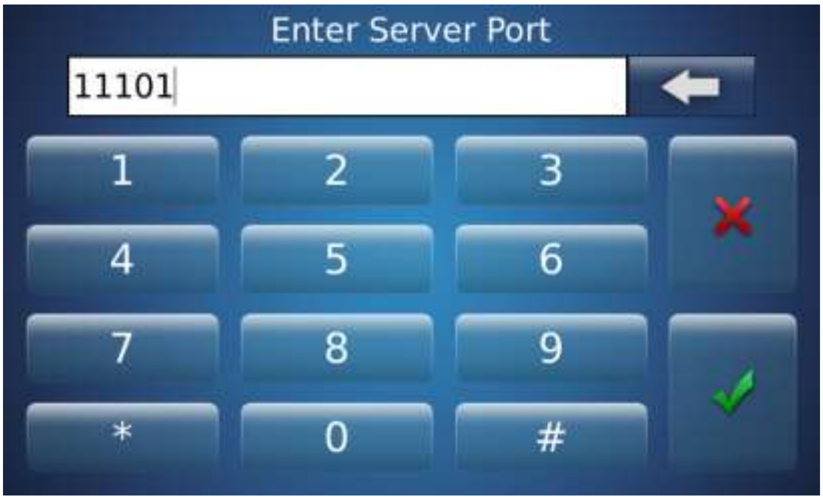


Enter Server IP address

10.99.11.115

Figure 279: Enter Server IP

4. Enter Server IP Address
5. Use "✓" button to move to next screen


Enter Server Port

11101

Figure 280: Entering Server Port

6. Enter Server Port
7. Use "✓" button to save

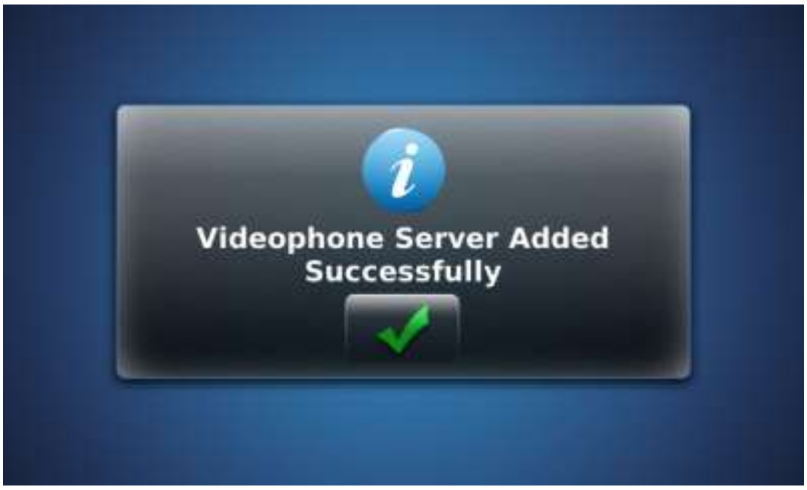

Videophone Server Added Successfully

Figure 281: Videophone Server is added successfully

Results

A success message is displayed showing video phone server is added successfully. Video call can be connected once server is configured.

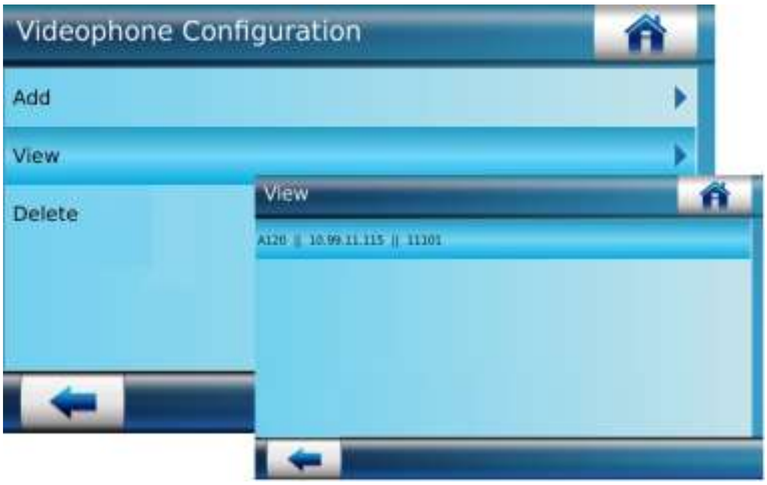
Viewing Video/Audio Phone Server Details

The administrator can view parameters of the video phone or audio phone server configured on MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, by using this feature.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > Video /Audio Phone Configuration	✓	✗
Webserver	MMI (Man-Machine Interface) > Video /Audio Phone Configuration	✓	✗

Screens & Steps



A120 || 10.99.11.115 || 11101

Figure 282: Viewing Video Phone Server Parameters

1. Press on **View** option
2. The configuration of server is displayed as below:
    a. **Server Name**
    b. **Server IP Address**
    c. **Server Port**
3. Use “←” button to go back

Delete Video/Audio Phone Server

The administrator can delete registered videophone/audiophone from the terminal, by using this functionality.

Access Path

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
Terminal Menu	System Menu > Terminal Settings > Video /Audio Phone Configuration	✓	✗
Webserver	MMI (Man-Machine Interface) > Video /Audio Phone Configuration	✓	✗

Screens & Steps

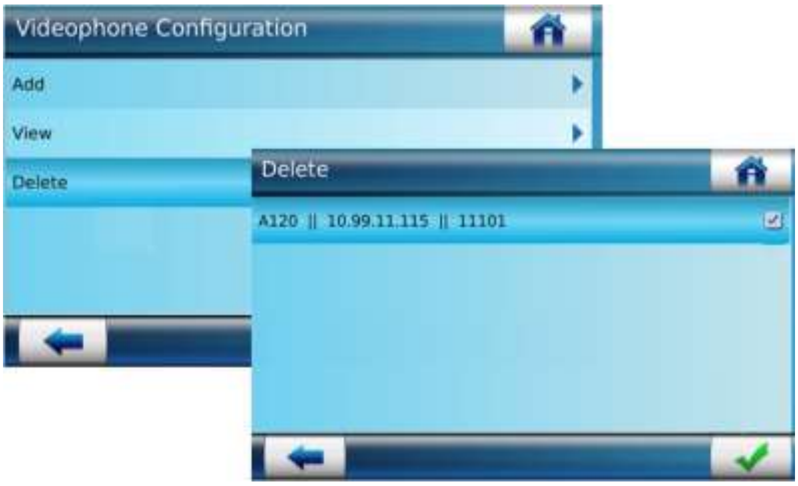
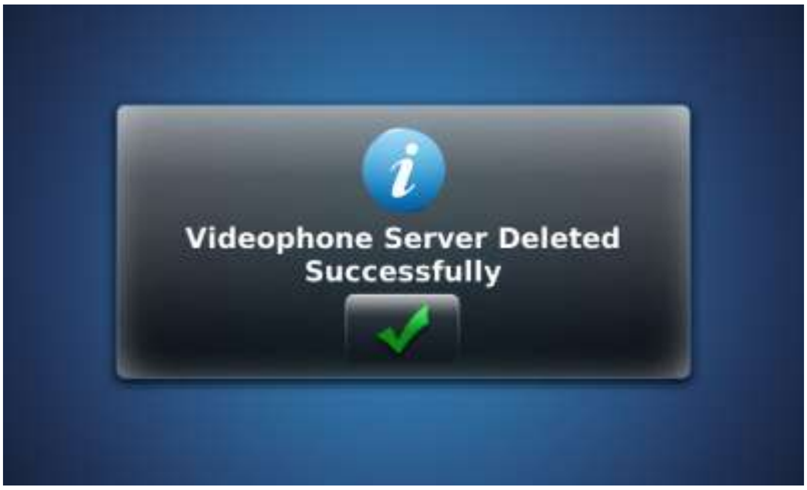


Figure 283: Deleting Video Phone Server

1. Press on **Delete**
2. On delete screen, select the server that is to be deleted
3. Press on "✓" button to delete server



Videophone Server Deleted Successfully

Figure 284: Video Server Deleted Success Message

Results

A success message is displayed on the screen showing video server is deleted. The record of the server is no longer available on the terminal

NOTE: The videophone icon on idle screen shall not be displayed if the videophone feature is not configured. The videophone icon is displayed on terminal only if at least a single VOIP profile is registered on the terminal

How User can make Video/Audio Call

Videophone feature of MorphoAccess® SIGMA Family or audiophone feature of *MorphoWave®* Compact enable end users to make a video/audio call to a customer care center. The executive at customer care center can view the user and solve all functional queries on call.

NOTE: During the video phone call, terminal does not allow any access control operations.

Pre-requisites

- Video Phone Server must be pre-configured. Refer to "*Configure Video Phone /* Audio Phone Server"

Screens & Steps

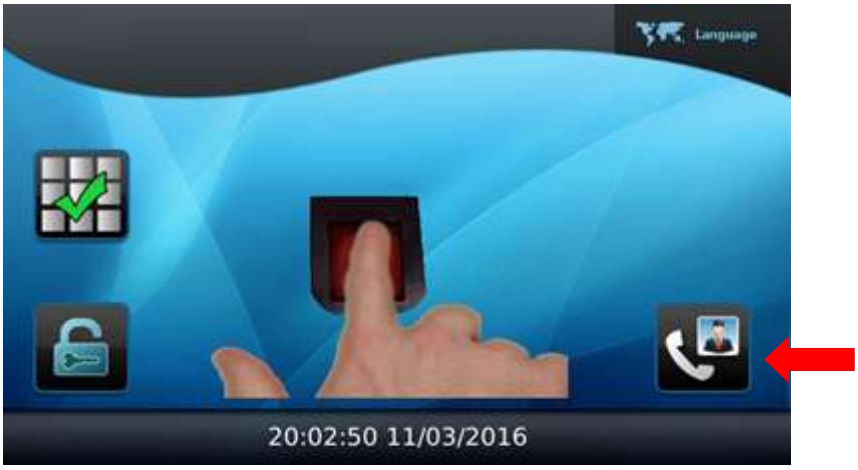


Figure 285: Making Video Call

1. On Home Screen of terminal, Press on **Call** icon, as shown in above screen

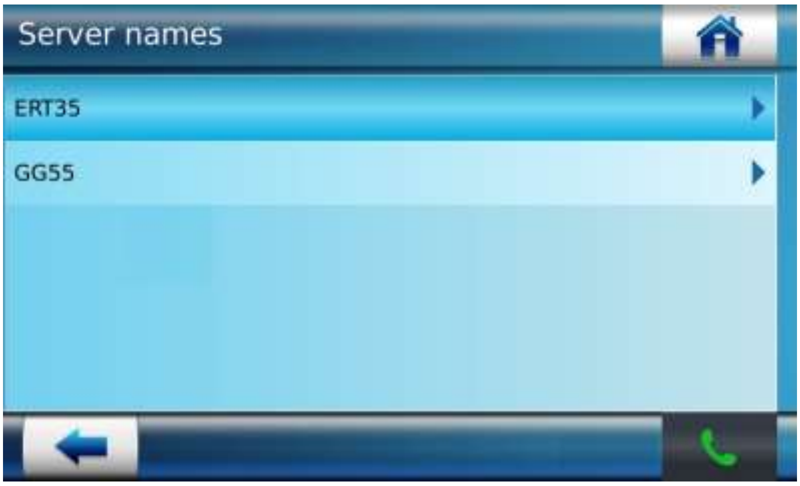


Figure 286: Select Server to make Video Call

2. The list of servers is displayed. Video call is connected to customer care center through these servers.
3. Select a **Server Name**
4. Press on **Dial** icon

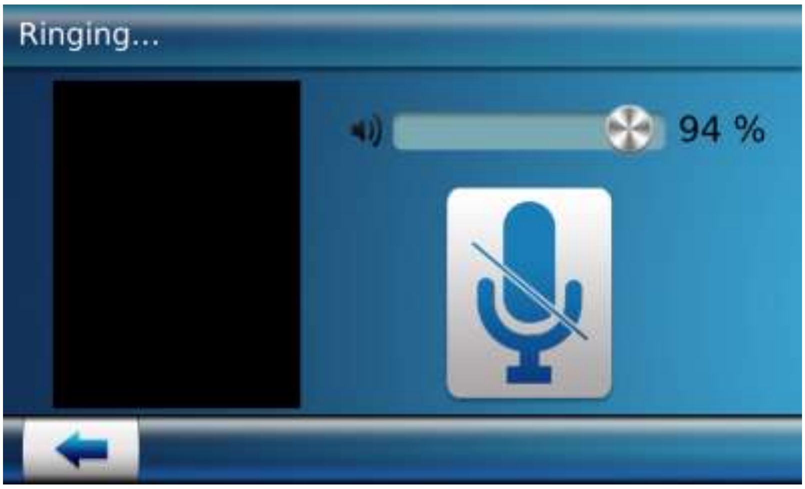


Figure 287: Connecting to remote server

5. Press on **"Push to talk"** icon once video phone call is established with remote server

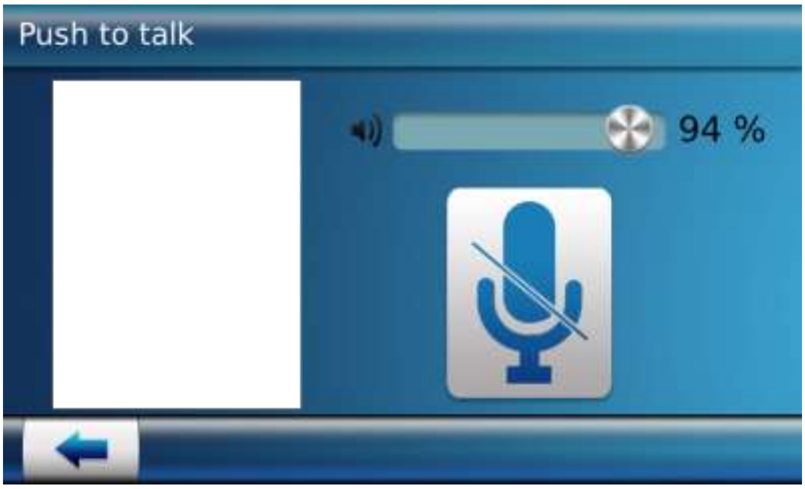


Figure 288: Push to talk

The user must press "🎙" button and speak. The user must understand that this communication is one way in nature, hence when he speaks by enabling the microphone, he cannot hear the executive's response.

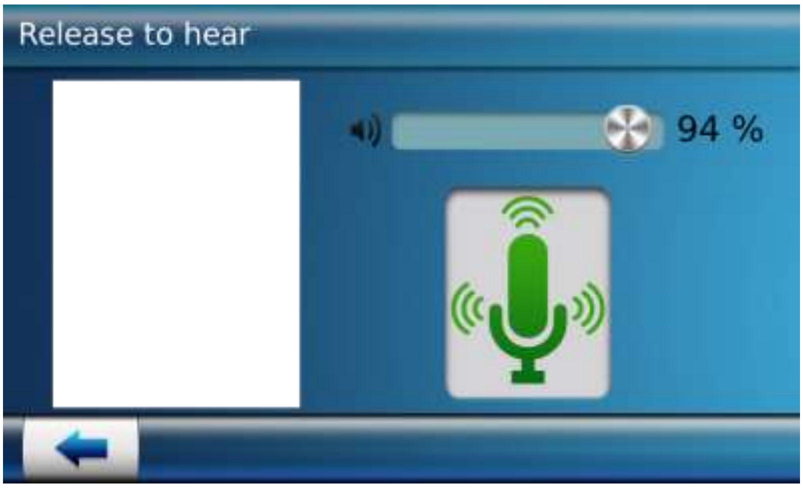


Figure 289: Release to hear

In order to enable hearing, the user must release the same button from the terminal end.

Results

A Video Phone Call is established with remote server. Video of end user is displayed on terminal and transmitted from terminal to the PC of customer center executive(CCE). It means only CCE can view the end user. While audio of both played at both end, means both end user and CCE can talk on a video call.

Section 7 : Terminal Menu for MorphoAccess® SIGMA Lite+ Series

MorphoAccess® SIGMA Lite+ Series terminal Screens

This section is about the screens displayed on MorphoAccess® SIGMA Lite+ Series terminals.

Terminal Home Screen

During the power up, the IDEMIA Logo and boot up animation will be displayed.

Idle screen will display wallpaper, date and time with different icons.

There will be four icons on the MorphoAccess® SIGMA Lite+ Series home screen

- Information icon – To show basic information about terminal.
- Authentication icon – To initiate authentication from touch screen.
- T & A icons - If Time & Attendance feature is enabled on the terminal then two icons for IN and OUT are displayed.

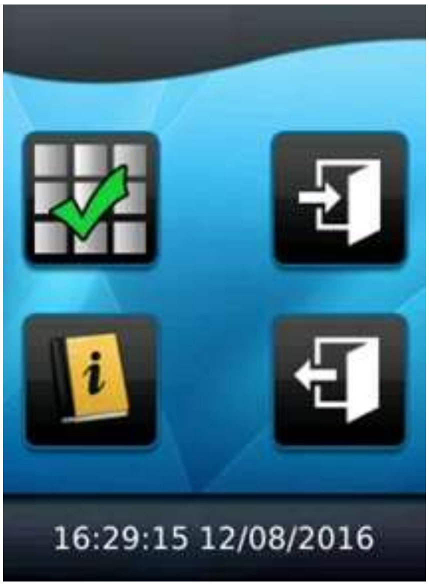


Figure 290: Terminal Home Screen

The wallpaper can be set via external commands, please refer to "*Steps to Setup Wallpaper*" section.

Terminal Information Menu

When Information button "i" is pressed, below Information Menu screen is displayed.

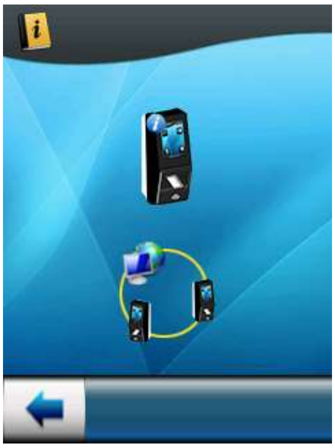
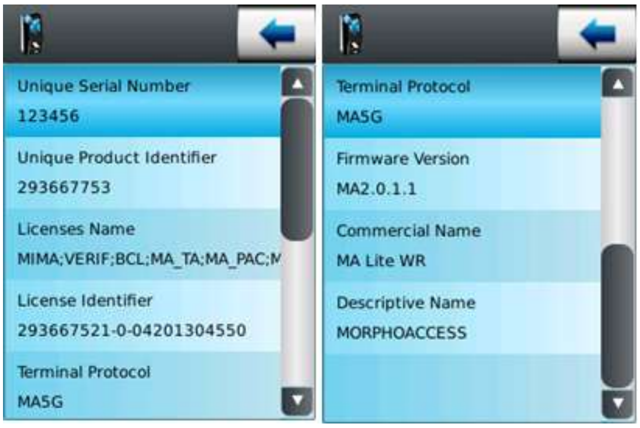


Figure 291: Information Menu

Terminal Details

The Terminal details will be displayed when “ ” icon is pressed.



Unique Serial Number
123456

Unique Product Identifier
293667753

Licenses Name
MIMA;VERIF;BCL;MA_TA;MA_PAC;M

License Identifier
293667521-0-04201304550

Terminal Protocol
MA5G

Terminal Protocol
MA5G

Firmware Version
MA2.0.1.1

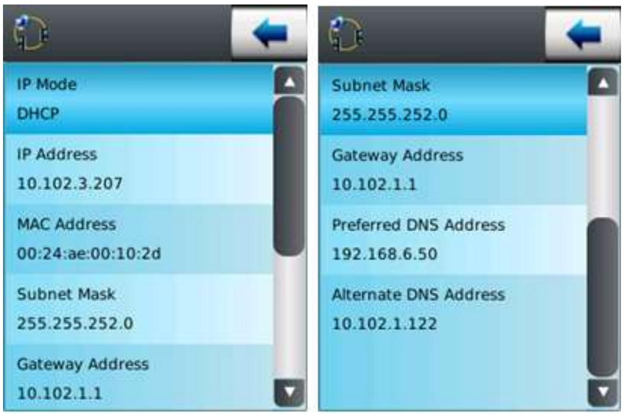
Commercial Name
MA Lite WR

Descriptive Name
MORPHOACCESS

Figure 292: Terminal Details

Communication Details

The communication parameters and their default settings will be displayed when “” icon is pressed.



IP Mode
DHCP

IP Address
10.102.3.207

MAC Address
00:24:ae:00:10:2d

Subnet Mask
255.255.252.0

Gateway Address
10.102.1.1

Subnet Mask
255.255.252.0

Gateway Address
10.102.1.1

Preferred DNS Address
192.168.6.50

Alternate DNS Address
10.102.1.122

Figure 293: Communication Details

Steps to Setup Wallpaper

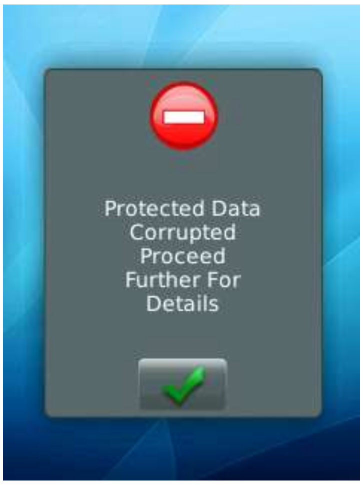
On boot up, the MorphoAccess® SIGMA Lite+ Series home screen may either display the wallpaper (if set) or the default company logo. The wallpaper can be set by external commands. Following are the steps to set the wallpaper

- Login to MorphoBioToolbox
- Navigate to File Management >> Files Management
- Select an image to set as wallpaper, Select Picture as 'File Type' and Select Wallpaper as 'File Subtype' and Click on 'Set file'

Verify that the wallpaper on screen is the one set in the steps above.

Recover Corrupted Components

There is a system within the terminal to recover corrupted secure container components like Smartcard Keys, Terminal Password, SSL Certificate and User Database. Due to issues such as power failure or interrupt in operation, corruption may occur. While booting up device if there is any corruption found in secure container component, terminal will display following screen in MorphoAccess® SIGMA Lite Series terminal.



Protected Data Corrupted Proceed Further For Details

Figure 294: Protected Data Corrupted Error

And on clicking on "✓" terminal lists all corrupted component as follows.

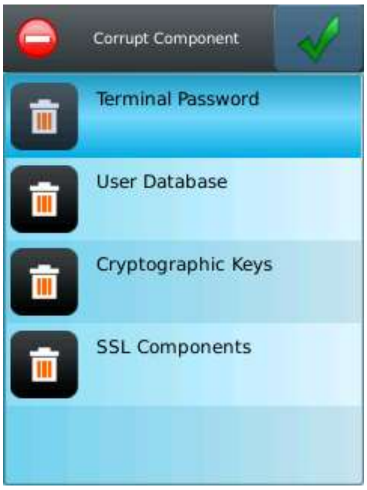
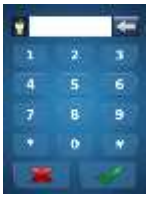
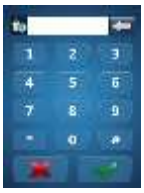
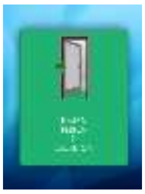
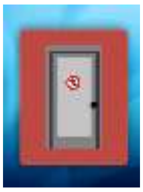
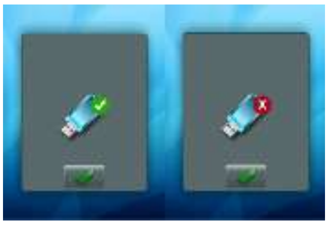
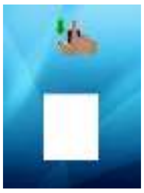
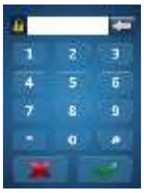


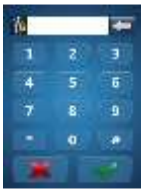
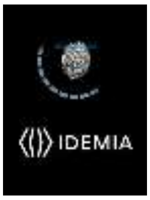
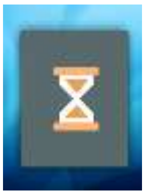
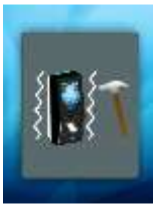
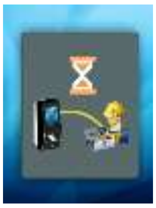
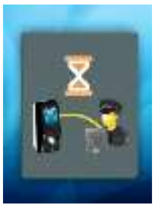
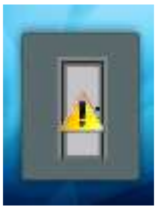
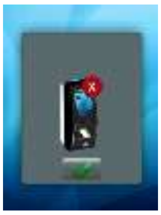
Figure 295: List Of Corrupted Components

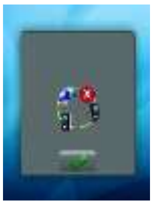
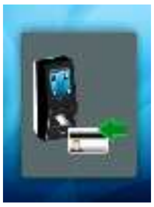
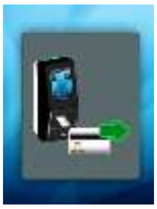
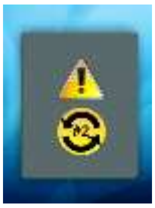
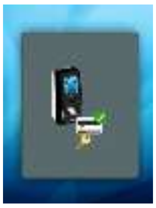
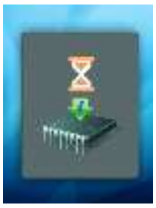
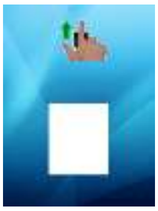
Once user selects "✓", corrupted component recovers to default state after terminal Reboot.

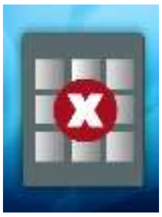
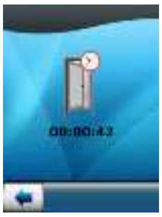
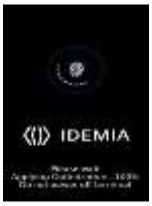
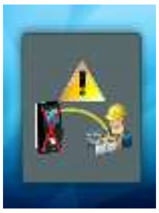
Display Screens and Actions

The following table, enlists the various actions and indications on the MorphoAccess® SIGMA Lite+ Series terminal and the corresponding screen appearance.

Display Screen	Action/Indication
	**Keypad Authentication**
	**Keypad Authentication for second user (In case of Multi User Mode)**
	**Access Granted**
	**Access Denied**
	**USB Information**
	**Live Finger Feedback with Animation**
	**Pin Entry Request**

Display Screen	Action/Indication
	**BIOPIN Entry Request**
	**Bootup Animation Screen (default)**
	**Please Wait…Action in Progress**
	**Tamper Detected**
	**Distant Session Is Opened**
	**Controller Feedback**
	**Animation with Door Open**
	**Configuration Failed for Device**

Display Screen	Action/Indication
	**Configuration Failed for Communication**
	**Place Card**
	**Remove Card**
	**Prompt for second attempt**
	**Admin Card Detected**
	**Firmware Upgrade Started**
	**Remove Finger**

Display Screen	Action/Indication
	**Invalid Input**
 00:00:43	**Time Override Mode – Active**
 IDEMIA Please wait Applying Database ... 100% Do not power off terminal	**Sensor DB Upgrade**
	**Terminal Blocked**

Section 8 : **Terminal Configuration through Webserver**

Access to Administration Menu through Webserver

The Webserver allows user to perform various actions and configurations on terminal, through below listed menus:

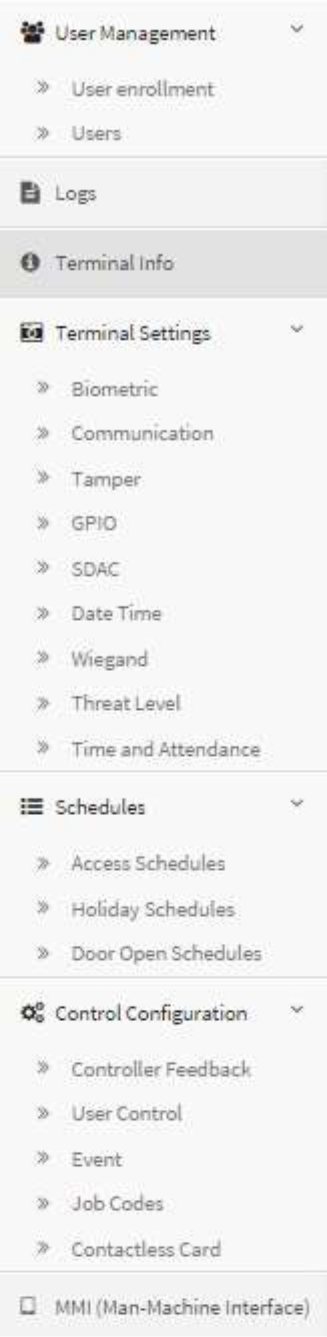


Figure 296: Webserver Administration Menu

- **User Management Menu**: For enrolling and managing users
- **Terminal Info Menu:** Used for viewing information of terminal
- **Reboot Product:** Allows an administrator to reboot terminal

- **Logs Menu:** Used for retrieving transaction logs, configure transaction and debug logs
- **Schedules Menu**: Used to add/edit/delete user defined Access Schedules, Holiday Schedules and Door Open Schedules
- **Control Configuration Menu**: Used to configure the Controller (Panel) Feedback, User Control Parameters, Events and Contactless Card parameters
- **Terminal Settings Menu**: Used to configure the Biometric, Communication, Wiegand, Threat Level, GPIO, SDAC and Terminal Date and Time
- **Reset Default Menu**: Used to reset all/any parameter to factory default values
- **Complete Configuration Menu**: Used to configure any parameter to access the terminal
- **MMI Menu** : Used to configure LCD display parmerets and modify graphical user interface.

Login to Webserver

An administrator can login to MorphoAccess® SIGMA Family or Morpho*Wave*® Compact terminal through Webserver using the default password (Please refer to the section: *Password Configuration*). An administrator can enroll new user in the system, edit user information, delete users from the terminal database, and reset user information from contactless smart cards.

Screens & Steps

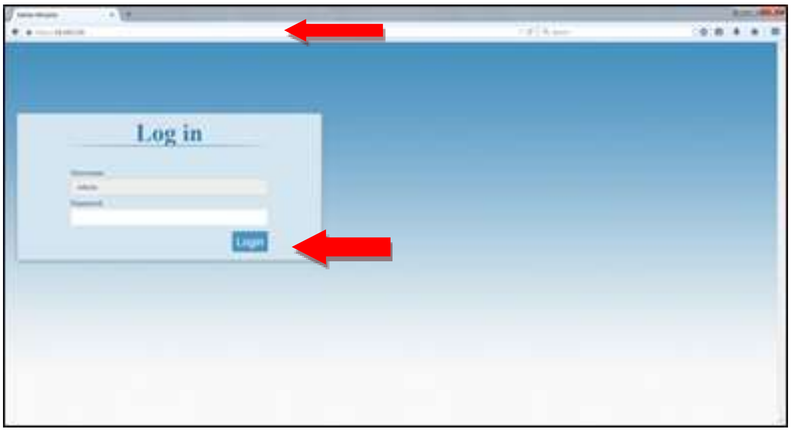


Figure 297: Logging in Webserver

1. Enter **Password** and Press on **Login** to save password

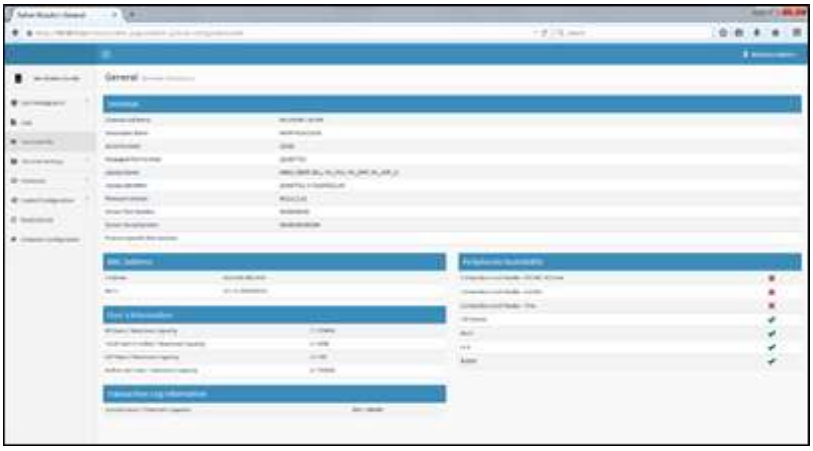


Figure 298: Administrator Menu

2. On successful login, an administrator menu is displayed, with various menus

User Enrollment in Database

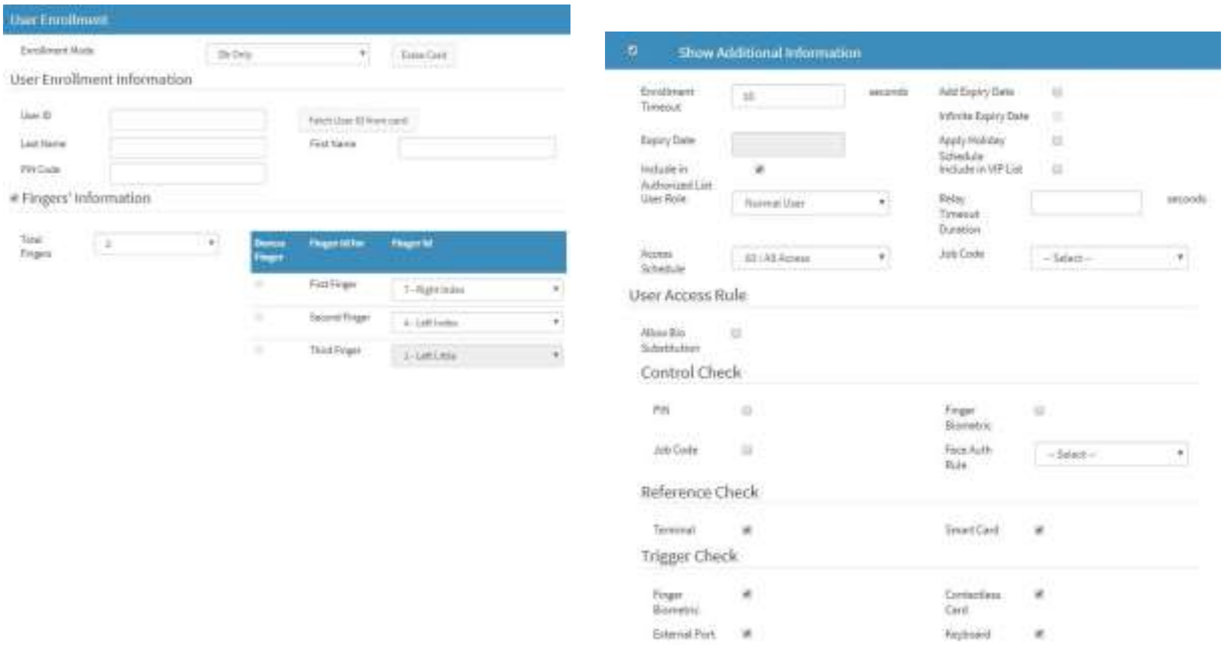
This feature of MorphoAccess® SIGMA Family and Morpho*Wave*® Compact terminals allows an administrator to enroll new users in the terminal. The user information such as name, biometric data (i.e. fingerprint), User ID and PIN, access rights, etc. are entered and stored in the terminal database.

Terminal will allow access to the user by comparing the data provided by the user at access request, against the data provided by the user at the time of enrollment.

Access Path

User Management > User Enrollment > Enrollment mode > DB Only

Screens & Steps



User Enrollment

Enrollment Mode: Db Only
Erase Card

User Enrollment Information

User ID:
Fetch User ID from card
Last Name:
First Name:
PIN Code:

Fingers' Information

Total Fingers: 2

Duress Finger	Finger Id for	Finger Id
○	First Finger	7 – Right Index
○	Second Finger	4 - Left Index
○	Third Finger	1 - Left Little

☑ Show Additional Information

Enrollment Timeout: 10 seconds
Add Expiry Date: □
Infinite Expiry Date: □
Expiry Date:
Apply Holiday Schedule: □
Include in Authorized List: ☑
Include in VIP List: □
User Role: Normal User
Relay Timeout Duration: seconds
Access Schedule: 63 / All Access
Job Code: -- Select --

User Access Rule

Allow Bio Substitution: □

Control Check

PIN: □
Finger Biometric: □
Job Code: □
Face Auth Rule: -- Select --

Reference Check

Terminal: ☑
Smart Card: ☑

Trigger Check

Finger Biometric: ☑
Contactless Card: ☑
External Port: ☑
Keyboard: ☑

Figure 299: Adding user information

1. Enter **User Identifier (User ID)**. Numeric value up to 24 digits.

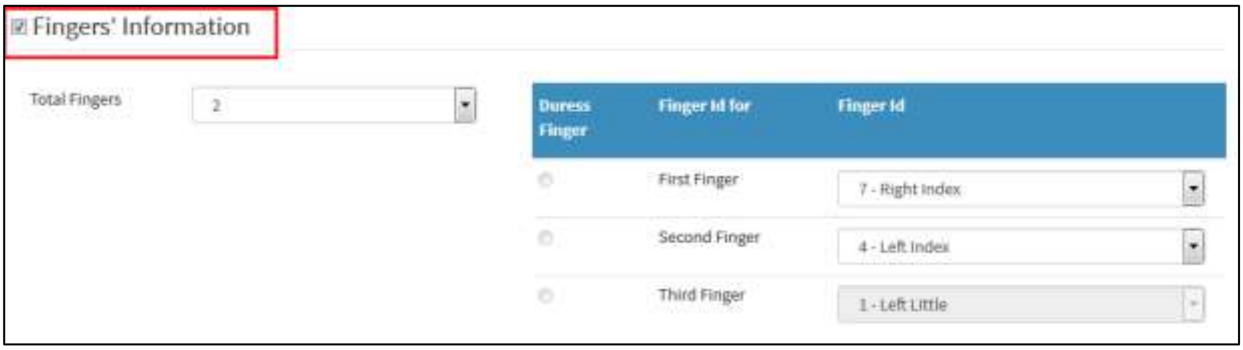
   NOTE:
   - Wiegand protocol for User ID doesn't support special characters such as "*" and "#", then is not recommended to insert these characters in the User ID value.
   - There is a configuration key, misc.user_id_edit, to make user ID field read only. With this parameter, the user id can be extracted from the Smartcard and restrict user to edit this field. misc.user_id_edit is accessible from PC application or Web Server.

2. Under **Enrolment Information** screen, an administrator need to enter several parameters:

   a. Enter the **First Name** of user

   b. Similarly, Enter **Last Name** of user

   c. Select the Finger Id for First and Second Finger to enroll fingerprints of the user



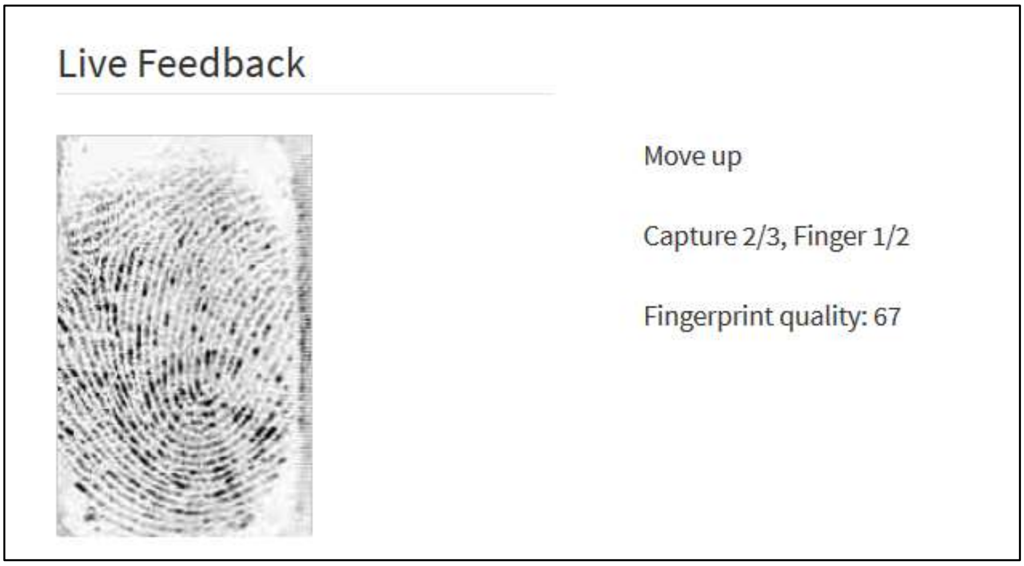
☑ Fingers' Information

Total Fingers: 2

Duress Finger	Finger Id for	Finger Id
○	First Finger	7 - Right Index
○	Second Finger	4 - Left Index
○	Third Finger	1 - Left Little

Figure 300: Enrolling Finger Index

3. A user is required to provide the biometric data of at least two different fingers. Select first finger for biometric data capture
4. Select second finger for biometric data capture



Live Feedback

Move up

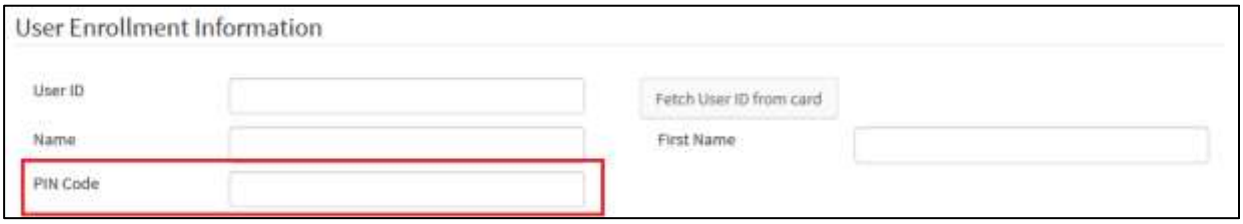
Capture 2/3, Finger 1/2

Fingerprint quality: 67

Figure 301: Biometric data capture

5. Place the finger on **biometric Sensor**. If the finger is not placed properly or within the time limit, an error message is displayed. Refer to "*SIGMA Family Series* Finger Placement Recommendation" section to know the correct position of finger.
6. Three Fingerprints are captured of the same user and the best quality image is auto-selected by the terminal

7. Once one fingerprint is stored, the administrator will need to capture the user's second fingerprint. Repeat steps 8 and 9 for enrolling finger 2
8. If the administrator wants to capture Duress Finger, the Total Fingers to enroll should be set as '3'
9. Repeat steps 8 and 9 to enroll the duress finger.

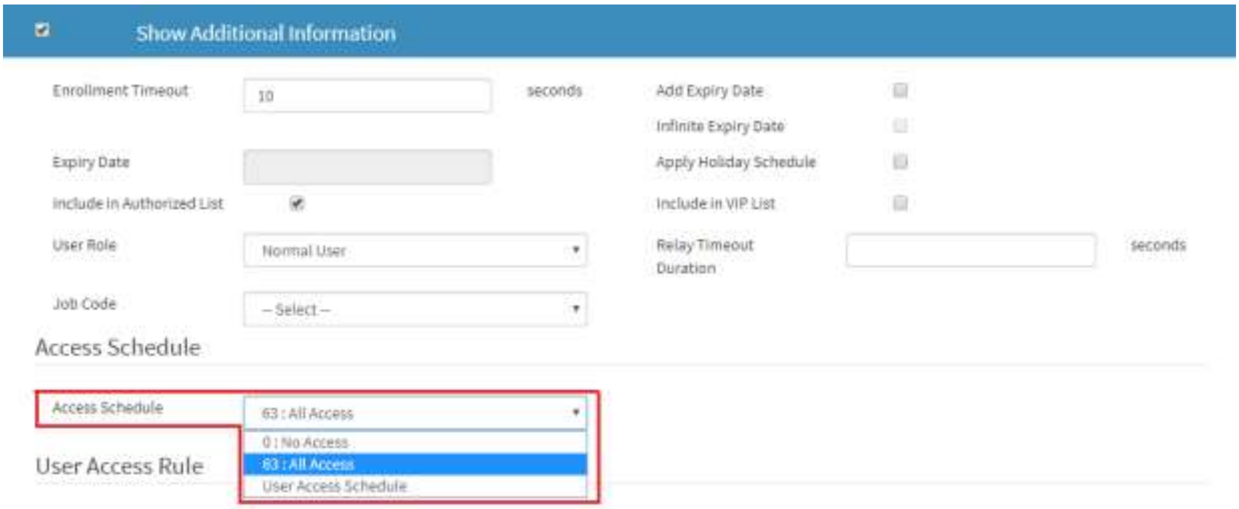


User Enrollment Information

User ID
Fetch User ID from card
Name
First Name
PIN Code

Figure 302: Enter User PIN

10. Enter **User PIN** which should be of up to 15 digits numeric. This PIN can be used by user, when PIN based authentication mode is enabled. The user will be required to enter PIN, for authentication.



☑ Show Additional Information

Enrollment Timeout: 10 seconds
Add Expiry Date □
Infinite Expiry Date □
Expiry Date
Apply Holiday Schedule □
Include in Authorized List ☑
Include in VIP List □
User Role: Normal User
Relay Timeout Duration: seconds
Job Code: -- Select --

Access Schedule

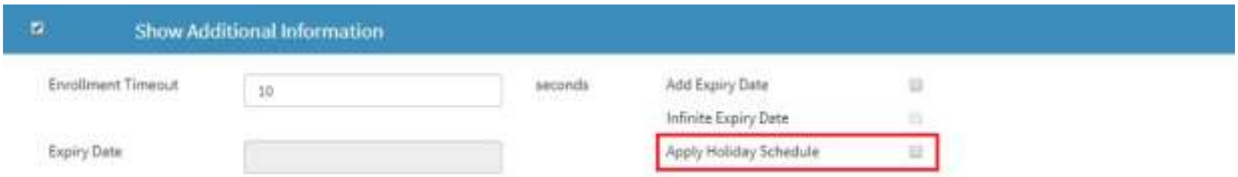
Access Schedule: 63 : All Access
- 0 : No Access
- 63 : All Access
- User Access Schedule

User Access Rule

Figure 303: Assigning Access Schedule

11. Select an **Access Schedule**, if the access is allowed within particular hours of the day. By default, the access schedule is selected as Schedule 63 that means access allowed at any time of the day.

NOTE: Refer to *"Define access Schedule" and "Define User Access Schedule"* under Configuration through Webserver section to know more about access schedule.



☑ Show Additional Information

Enrollment Timeout	10	seconds	Add Expiry Date	□
			Infinite Expiry Date	□
Expiry Date			Apply Holiday Schedule	□

Figure 304: Enrolment Information Screen – Configuring parameters

12. Configure **Observe Holiday Schedule** by enabling or disabling. If this parameter is enabled, then access on holiday will be provided as per defined holiday schedule. If this parameter is disabled, then authentication is done without any check on holiday schedule.

    NOTE: Refer to “Define Holiday Schedule” under know more about access schedule.

13. Configure **Relay Timeout Duration** in seconds. The door stays open for the time duration defined here for the particular user.

14. Configure user **Expiry Date** in case user account requires to activate for specific duration or it can be activated forever

    a. If Infinite Expiry Date parameter is set to ON, then the user expiry is considered as infinite.

    b. If any Expiry Date is set, then the user record shall expire by the end of the set date.

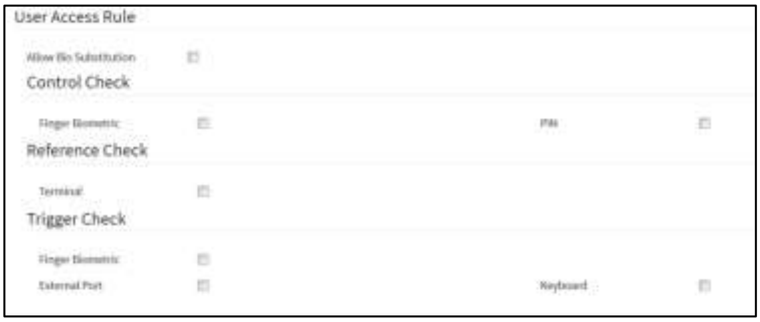
15. Configure **Include in Authorized List** as ON or OFF. Only if the user is in Authorized list, access will be granted. By default, this parameter is set as OFF.

    NOTE: The authorized list parameter will be effective only if the parameter “Check User ID Authorized List” is ON, under Control Configuration > User Control.

16. Configure **Include in VIP List** as ON or OFF. If user is enrolled as VIP user, then at the time of authentication, terminal will not ask for biometric or PIN or BIOPIN.

    NOTE: The VIP list parameter will be effective only if the parameter “Allow VIP authentication bypass” is ON, under Control Configuration > User Control.

17. Configure **User Access Rule**. This configuration panel allows an administrator to modify the general authentication rule applied to all users, to user specific settings.



User Access Rule

Allow Bio Substitution □

Control Check

Finger Biometric □ PIN □

Reference Check

Terminal □

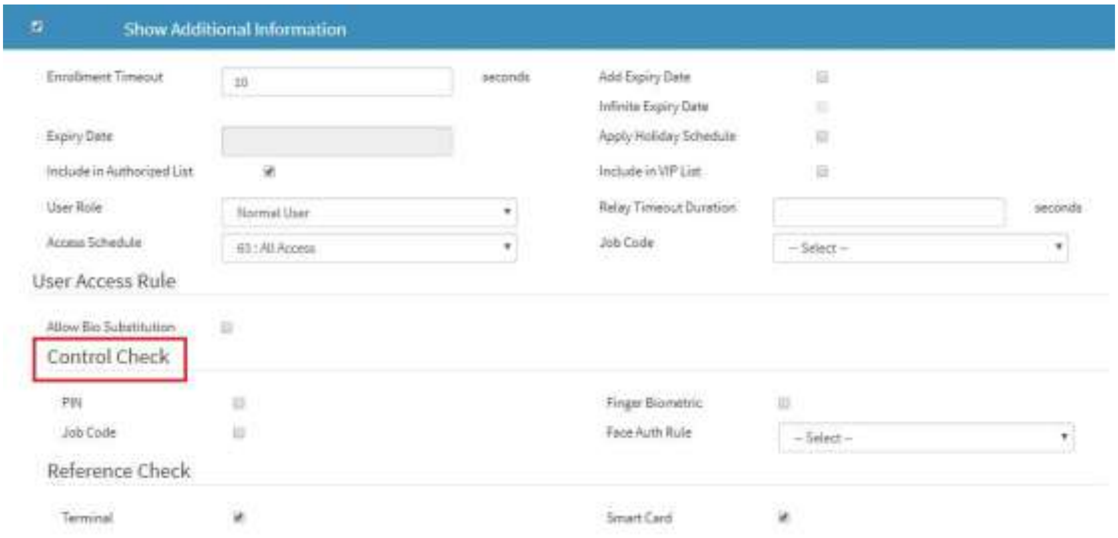
Trigger Check

Finger Biometric □

External Port □ Keyboard □

Figure 305: Defining User Rule

18. The User Rule settings includes below parameters:
19. Under **Trigger Check**, an administrator can configure the mediums through which user can trigger request for access
    a. Set Finger **Biometric** as ON, if an administrator wants to allow user to access by fingerprint identification. If trigger event through biometric is OFF, then user cannot initiate the access rights check using fingerprint. And Biometric Check will be bypass for the particular user.
    b. Set **Contactless Card** as ON, if an administrator wants to allow user to request access by presenting card authentication
    c. Set **Keypad** as ON, if an administrator wants to allow user to request access by entering User ID using keypad. The authentication is done by matching the User ID of the stored user in the database.
    d. Set **External Port** as ON, if an administrator allows a user to request access by providing his User ID through External port
20. Under **Reference Check**, an administrator can configure whether user's information should be referred from Terminal database or/and Smart Card
    a. Set **Terminal** as ON, if terminal should refer to user's profile in database
    b. Set **Smart Card** as ON, if terminal should refer to user's profile in smart card



☑ Show Additional Information

Enrollment Timeout: 10 seconds
Add Expiry Date: □
Infinite Expiry Date: □
Expiry Date:
Apply Holiday Schedule: □
Include in Authorized List: ☑
Include in VIP List: □
User Role: Normal User
Relay Timeout Duration: seconds
Access Schedule: 63 : All Access
Job Code: -- Select --

User Access Rule

Allow Bio Substitution: □

Control Check

PIN: □
Finger Biometric: □
Job Code: □
Face Auth Rule: -- Select --

Reference Check

Terminal: ☑
Smart Card: ☑

Figure 306: Defining User Rule – Control Check

21. Under Control Check, an administrator can set:
    a. **PIN** mode as ON, if PIN based authentication is required
    b. **Finger Biometric** as ON, if Biometric authentication is required

c. **Job Code** as ON, if Job Code based authentication is required

d. **Face Auth Rule,** this configuration defines face authentication check workflow rule. Possible values are “Disabled”, “Photo taking”, “Face detection (optional)” and “Face detection (mandatory)”. This is only available for MorphoAccess® SIGMA and SIGMA Extreme Series terminals. Please refer to the section “*Additional User Controls*” for understanding the face detection workflow

22. **Allow Bio Substitution** parameter can be set as ON. It indicates that instead of Biometric, the user can be authenticated through a substitute such as BIO-PIN or PIN
23. Press on **Enroll User** to **Enroll** the user with the details inputted.

Results

A confirmation message is displayed showing User is enrolled successfully. The user information is stored in the database.

Whenever user tries to access by providing fingerprint, terminal will match the fingerprint with the records stored in the database and allow access on successful identification.

Recommendation: In case of authentication failed due to bad biometric, the user can be re-enrolled. In case of L1 mode, the re-enrolment can be done using Secure Admin station equipped with a MorphoSmart™ MSO biometric sensor only.

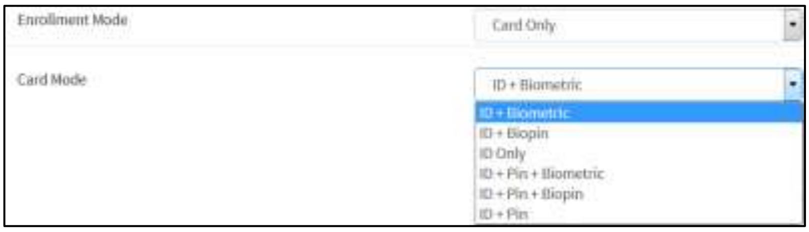
User Enrolment in Card

The administrator can encode a contactless smartcard for a user, using this functionality. The user's data are saved only on the card, and not in the terminal database. It means, that the authentication of the user is done by checking the user's data stored in the card. For example, when user place finger on biometric sensor, the terminal will check the biometric provided by the user with the biometric stored in the user’s card.

Access Path

Webserver > User Management > User Enrollment > Enrollment Mode > Card Only

Screens & Steps



Enrollment Mode: Card Only

Card Mode: ID + Biometric

Figure 307: Select Card Data Format

1. Card Data Format allows an administrator to select the data that will be used for user authentication. Below options are available:
   a. **ID + Template:** This format indicates that the user authentication is done by verifying the User ID and biometric template (i.e. fingerprint registered by user) Three biometric templates can be stored for a user including two mandatory biometric templates (fingerprints) and one duress finger
   b. **ID + BIOPIN:** This format indicates that the user authentication is done by verifying the User ID and BIOPIN (i.e. PIN that is used in place of biometric data)
   c. **ID Only:** This format indicates that the user authentication is done by verifying the User ID
   d. **ID + PIN + Template:** This format indicates that the user authentication is done by verifying the User ID, PIN, and Biometric Template
   e. **ID + PIN + BIOPIN:** This format indicates that the user authentication is done by verifying the User ID, PIN, and BIOPIN
   f. **ID + PIN:** This format indicates that the user authentication is done by verifying the User ID, and PIN
2. According to the selected Card Data Format, next user’s data will be captured and stored in the card. The below steps are for ID + Template format
3. Refer steps 1 to 26 of section “*User Enrolment in Database”*
4. A message to place card at terminal is displayed.
5. **Place Smart Card** on the card reader. You may have to place card for 1 to 10 seconds, till the success message is displayed showing the user's data is stored in the card

Results

The user is enrolled successfully and user's data is stored in the Card. The user can initiate access request by placing a card at terminal. The terminal will read User ID and ask user to enter required data, i.e. biometric/pin/biopin.

The user’s data stored on card are neither editable nor viewable.

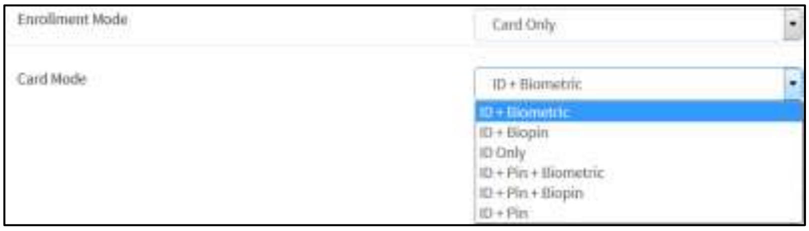
User Enrolment in Card & Database

The administrator can enroll a new user and store the user data in contactless smartcard as well as in database of terminal. It means, that the authentication of the user is done by checking the details stored in the card as well as in terminal database. For example, when user places finger on biometric sensor, the terminal will check the biometric provided by the user against the biometric stored in the users card.

Access Path

Webserver > User Management > User Enrollment > Enrollment Mode > DB + Card

Screens & Steps



Enrollment Mode: Card Only

Card Mode: ID + Biometric

Figure 308: Select Card Data Format

1. Card Data Format allows an administrator to select the user's data required for access rights check, and then required to be written on user's card. Please refer to step # 1 of "*User Enrolment in Card"* section for various available options
2. Please refer to "*User Enrolment in Database"* section step # 1 to 26
3. A message to place card at terminal is displayed.
4. On placing card, the user's data is stored in the card and the terminal asks user to remove the card.

Results

The user is enrolled successfully and user's data are stored in the terminal database and smartcard. The user can initiate access request by placing a card at terminal. The terminal will read User ID and ask user to enter required data, i.e. biometric/pin/biopin. The authentication of user's details is done based on **Record Reference Source** selected in User Rule.

The user's data stored on card are not editable or viewable.

Recommendation: In case of authentication failed due to bad biometric, the user can be re-enrolled. In case of L1 mode, the re-enrolment can be done using Secure Admin station equipped with a MorphoSmart™ MSO biometric sensor only.

Update User Information

The administrator can edit the user information stored in database, using this functionality. It is not possible to edit the information of the user stored on the Card but it is possible to erase and rewrite the user's card with new data.

Access Path

Webserver > User Management > Users

Screens & Steps

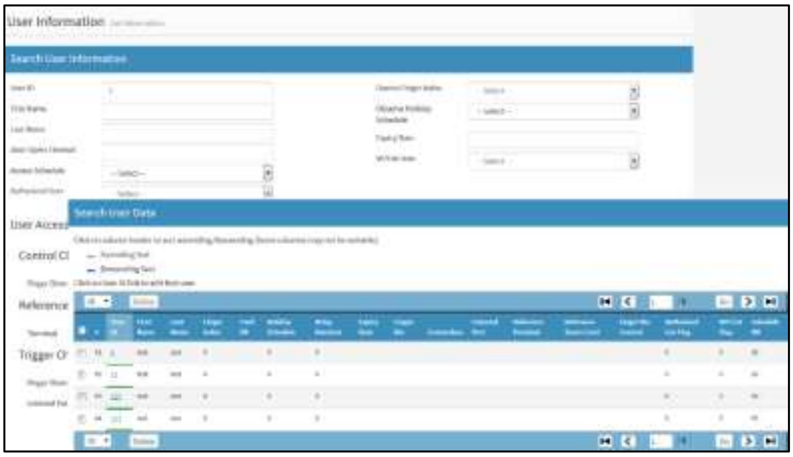


Figure 309: Selecting User ID

1. Select Search User by **ID**, **First Name** or **Last Name**
2. Press on **Search** button to Search the users enrolled
3. Enter the **User ID** of the user account which is required to be edited
4. Press on **Search** button to get the user details enrolled with the entered User ID
5. The list of User IDs with the entered ID placed anywhere in the user ID will be displayed. **Select User ID** from the list and click on the User ID to get the details entered during enrollment.

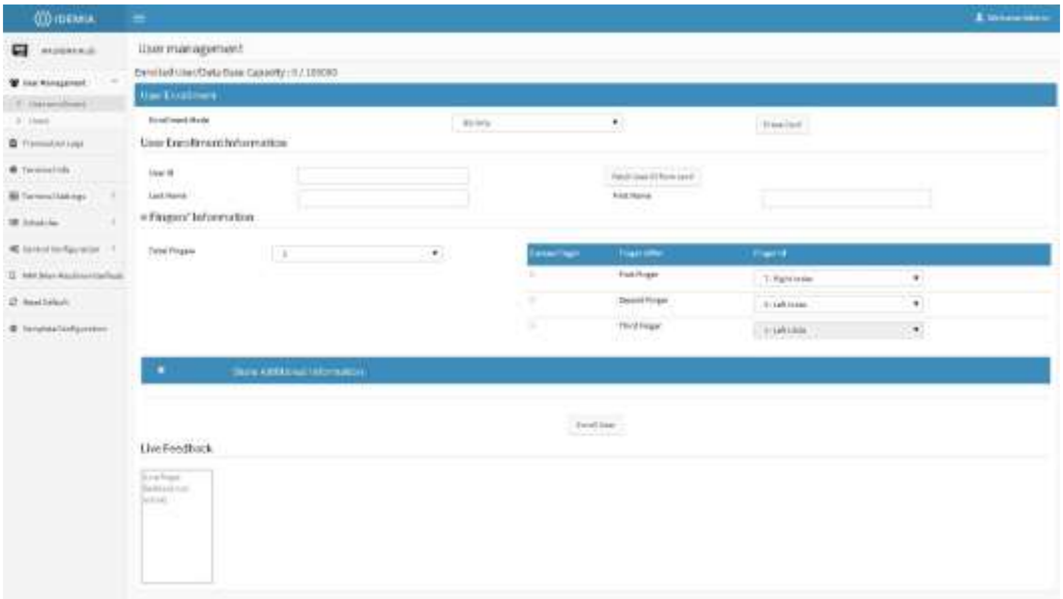


Figure 310: Enrolment Information screen is displayed for editing

1. Enrolment Information screen is displayed. An administrator can update below information:
   a. First Name and Last Name of the user
   b. Capture Fingerprints
   c. Update User Pin
   d. Configure Access Schedule
   e. Set Observe Holiday Schedule
   f. Set Door Open Timeout
   g. Add Expiry Date
   h. Configure Authorized list
   i. Configure VIP User
   j. Configure User Rules
2. To update a user field without capture fingerprint, uncheck the Fingers' Information box.
3. Press on **Enroll User** to **Save** user information

Results

The user information is updated and stored in database. When user tries to access, the updated information is used for verification.

Note: The list of User ID's retrieved upon search are displayed in the string format and not in the serial order.

Delete User

Using this functionality, an administrator can delete user information. There are several options for deleting users:

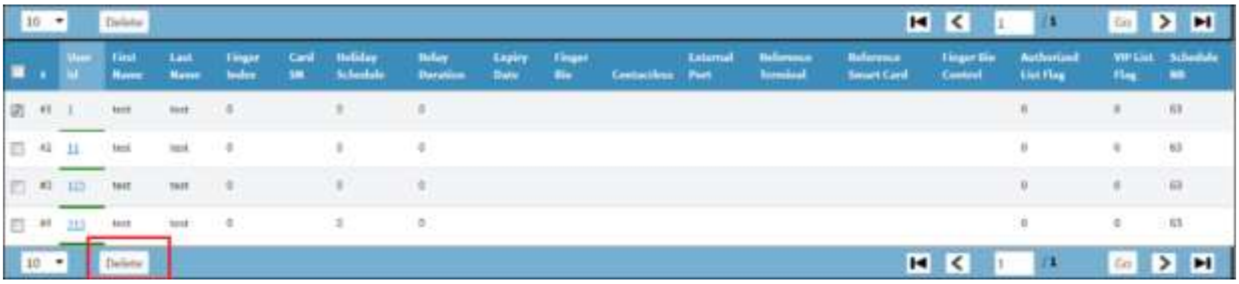
- Delete a User
- Delete All Users

Delete a User

Access Path

Webserver > User Management > Users

Screens & Steps



☐	#	User Id	First Name	Last Name	Finger Index	Card SN	Holiday Schedule	Relay Duration	Expiry Date	Finger Bio	Contactless	External Port	Reference Terminal	Reference Smart Card	Finger Bio Control	Authorized List Flag	VIP List Flag	Schedule [illegible]
☑	#1	1	test	test	0		0	0								0	0	63
☐	#2	11	test	test	0		0	0								0	0	63
☐	#3	111	test	test	0		0	0								0	0	63
☐	#4	211	test	test	0		0	0								0	0	63

Figure 311: Deleting User

1. Get the list of Users enrolled in the terminal
2. Select the **User ID** that the administrator need to delete
3. Press on **Delete** button to delete the user
4. A confirmation message is displayed, asking to confirm the action
5. Press on **OK** to confirm delete action

Results

The User ID is deleted successfully. The terminal will deny access to the deleted user upon user control.

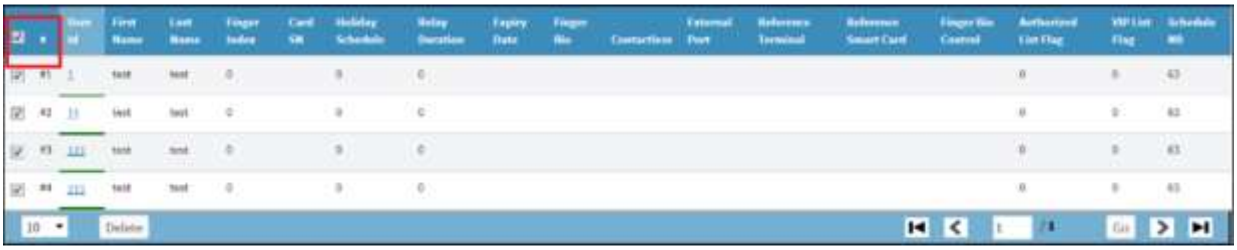
Delete All User ID

This functionality will delete all the users stored in terminal database.

Access Path

Webserver > User Management > Users

Screens & Steps



☑	#	User Id	First Name	Last Name	Finger Index	Card SN	Holiday Schedule	Relay Duration	Expiry Date	Finger Bio	Contactless	External Port	Reference Terminal	Reference Smart Card	Finger Bio Control	Authorized List Flag	VIP List Flag	Schedule [illegible]
☑	#1	1	test	test	0		0	0								0	0	63
☑	#2	11	test	test	0		0	0								0	0	63
☑	#3	111	test	test	0		0	0								0	0	63
☑	#4	211	test	test	0		0	0								0	0	63

Figure 312: Select Delete All Users action

1. Select **Delete All Users** to delete all the user in the database
2. A confirmation message is displayed, asking to confirm the action

3. Press on **OK** to confirm delete all users action

Card Manager

MorphoAccess® SIGMA Family and Morpho*Wave*® Compact terminals allow user enrolment and authentication using contactless smart cards. When a user is enrolled on smart card, the User Identifier, Fingerprint Template and PIN/BIOPIN are stored in the card. Terminal can check this information on card for authenticating a user.

Using Card Manager Menu, an administrator can configure the contactless smart card parameters, which are supported by MorphoAccess® SIGMA Family and Morpho*Wave*® Compact terminals.

Access Path

User Menu > Card Manager

Screens & Steps

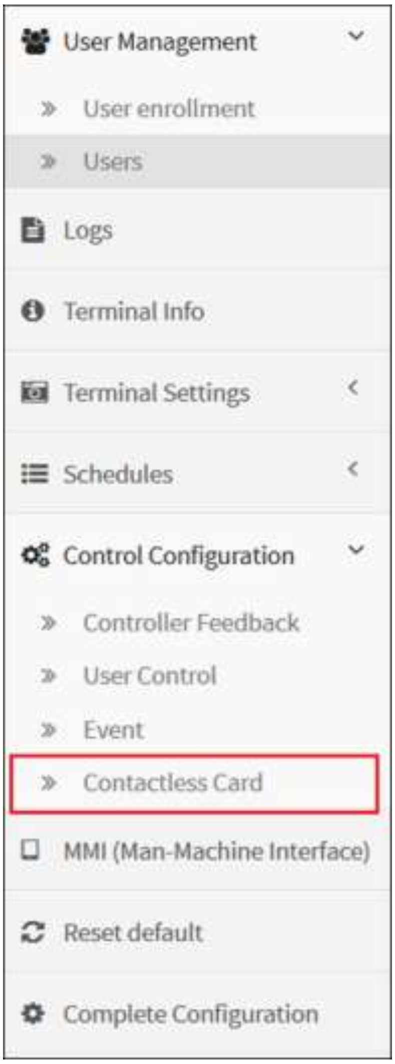


Figure 313: Contactless Card Configuration – Webserver

The card manager has certain parameters that are required to be configured, for required behavior of the system. These parameters are explained subsequently.

Renewal of User Card

A smart card may have an expiry date. Once the smart card is expired it is not useful for verification. Using Renewal of User Card functionality, an administrator can renew a contactless card that is expired, with the same user data such as User ID, fingerprint, PIN and BIOPIN; stored in it. By renewing user card, the expiry of the card is reset and card can be used for verification.

This feature is also useful when a user lose his card. In that case, it is recommended to add the lost card to the Banned list, in order to avoid fraudulent use of the lost card.

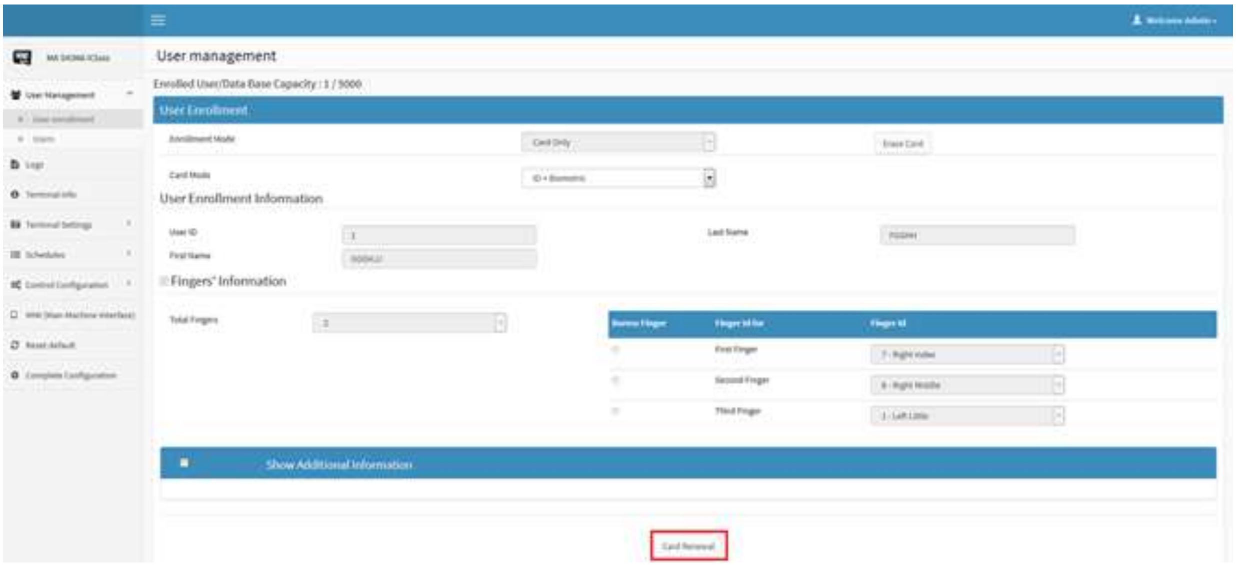
Access Path

Webserver > User Management > Users

Pre-requisites

- User data stored must be available in terminal database, the same data is written on card on renewal.
- Card is secured with the same key as on terminal.

Screens & Steps



User management

Enrolled User/Data Base Capacity : 1 / 5000

User Enrollment

Enrollment Mode: Card Only

Card Mode: ID + Biometric

User Enrollment Information

User ID: 1

Last Name: [illegible]

First Name: [illegible]

Fingers' Information

Total Fingers: 3

Duress Finger	Finger Id for	Finger Id
○	First Finger	7 - Right Index
○	Second Finger	8 - Right Middle
○	Third Finger	1 - Left Little

Figure 314: Renewal of User Card

1. Go to Users and Search the user
2. Click on user and Terminal will open a new window “Edit Type”
3. Select Card Only to Renew the Card
4. Now terminal open a new page to renew the card for the user
5. Select the card data format from available options as below:
    a. ID + Template (fingerprint)
    b. ID + BIOPIN
    c. ID Only
    d. ID + PIN + Biometric
    e. ID + PIN + BIOPIN
    f. ID + PIN
6. Enter the details required

7. Click on **Card Renewal** to renew the card
8. Terminal will ask to place the card on card reader. **Place card**

Results

User's data stored in terminal database are copied on the card. The card is renewed with new expiry date if it is configured. Now user can use this card for authentication.

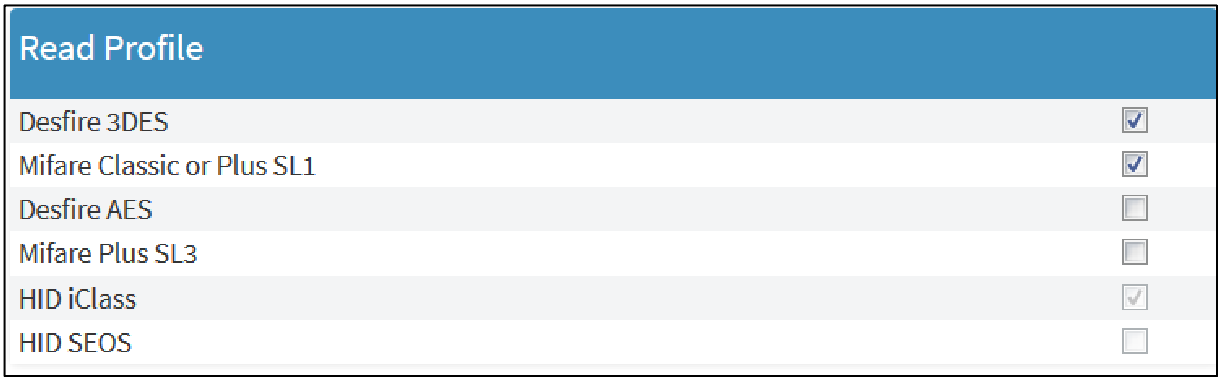
Smart Card Read Profile

The administrator can set the type of card that MorphoAccess® SIGMA Family and Morpho*Wave*® Compact terminals will be able to read, using this functionality. It means these cards can be used for authentication purpose only. The data on the card cannot be changed.

Access Path

Webserver > Control Configuration > Contactless Card > General Parameters> Read Profile

Screens & Steps



Read Profile

Desfire 3DES	☑
Mifare Classic or Plus SL1	☑
Desfire AES	☐
Mifare Plus SL3	☐
HID iClass	☑
HID SEOS	☐

Figure 315: Smartcard Read Profile

Select **Smartcard Read Profile**

1. Set the following cards read profile as ON, if an administrator require terminal to read them:

   ➔ <u>In case of Multi Product</u>

   a. MIFARE® Classic

   b. MIFARE® DESFire® 3DES

   c. MIFARE® DESFire® AES

   ➔ <u>In case of iClass Product</u>

   a. HID IClass®

   b. HID IClass®SE

2. Press on **Save** button to save configuration

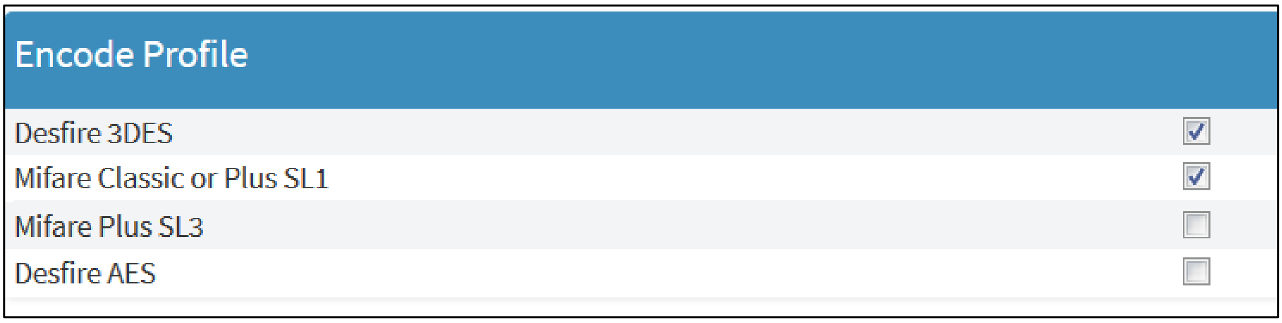
Smart Card Encode Profile

The administrator can set the type of card that MorphoAccess® SIGMA Family and Morpho*Wave*® Compact terminals will be able to encode, using this functionality. It means these cards can be used to store user's profile and used for user authentication. It is possible to update/reset card's data.

Access Path

Webserver > Control Configuration > Contactless Card > General Parameters> Encode Profile

Screens & Steps



Encode Profile

Desfire 3DES ☑
Mifare Classic or Plus SL1 ☑
Mifare Plus SL3 ☐
Desfire AES ☐

Figure 316: Smartcard Encode Profile

Select **Smartcard Encode Profile**

1. Set the following smartcards encode profile as ON, if an administrator require terminal to encode them:

   a. MIFARE® Classic

   b. DESFire® 3DES

   c. DESFire® AES

   NOTE:
   - It is not possible to encode several type of MIFARE (Classic) or DESFire (3DES and AES) cards at the same time. And for HID iClass, Encode profile is not applicable as there is only one type HID iClass card for encoding.

2. ss on **Save** button to save configuration

No. of Blocks and Start Block for MIFARE® Cards

It is possible to define the location of the access control data on the contactless card, by specifying the number of the first block and total number of blocks to read on the card. By default, the 1st block to read is block # 4 and total number of blocks is #31.

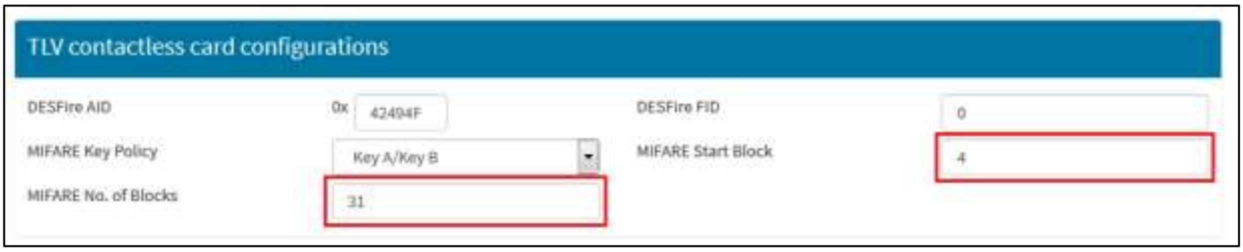
NOTE 1: The value specified for the start block and number of blocks, also applies to the administrator cards, then ensure that administrator data is stored from the same block number as user data on user cards and on given number of blocks.

NOTE 2: In case of 1 K MIFARE®, an administrator can set start block no. 4 to block 48. In case of 4 K MIFARE®, an administrator can set start block no. 4 to block 216.

Access Path

Webserver > Control Configuration > Contactless Card > TLV contactless card configuration > MIFARE Start Block

Screens & Steps



TLV contactless card configurations

DESFire AID 0x 42494F

DESFire FID 0

MIFARE Key Policy Key A/Key B

MIFARE Start Block 4

MIFARE No. of Blocks 31

Figure 317: Setting No. of Block & Start Block

Select **No. of Blocks** & **Start Block**

1. Press on **Save** button to save changes

Select Keyset for Reading MIFARE® Cards

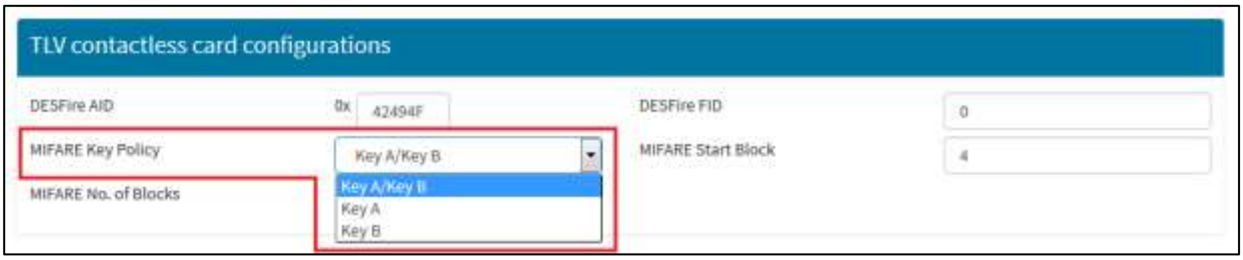
The administrator can select a key set that is used by terminal for authentication and reading MIFARE® cards, using this functionality. The below key set values can be configured:

- Key A
- Key B
- Key A and Key B

Access Path

Webserver > Control Configuration > Contactless Card > TLV contactless card configuration > MIFARE Key Policy

Screens & Steps



TLV contactless card configurations

DESFire AID 0x 42494F

DESFire FID 0

MIFARE Key Policy Key A/Key B

MIFARE Start Block 4

MIFARE No. of Blocks

Figure 318: Key Policy configuration

1. Select a **Key Policy**
2. Press on **Save** button to save changes

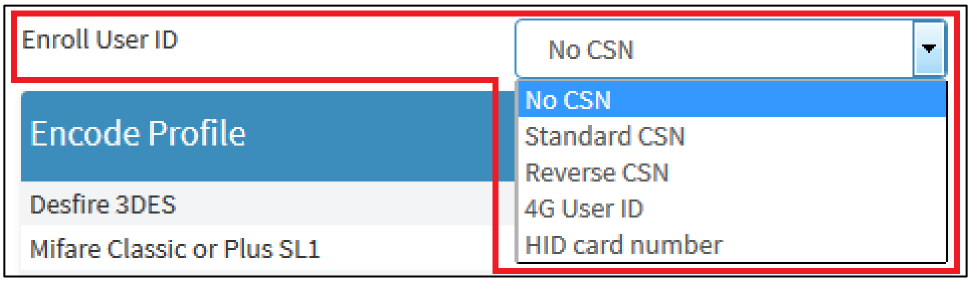
Select Enroll ID Format

The administrator can set the User ID format to be encoded on card, using this functionality.

Access Path

Webserver > Control Configuration > Contactless Card > General Parameters > Enroll User ID

Screens & Steps



Enroll User ID No CSN

Encode Profile

Desfire 3DES

Mifare Classic or Plus SL1

Figure 319: Selecting Enroll User ID Format

1. Select Enroll User ID Format
2. Select User ID format used for enrolling users on card:
    a. **No CSN**: this value indicates that contactless card serial number will not be used as User ID
    b. **Standard CSN**: If this option is selected, the contactless card serial number is considered as User ID at the time of enrolment and authentication

c. **Reverse CSN**: If this option is selected, the contactless card serial number read in reverse byte order, is considered as User ID at the time of enrolment and authentication

d. **4G User ID**: If this option is selected, the read contactless card serial number is manipulated as per 4G terminal. Manipulation is as per given below.

```
e.g.
Step 1: CSN read from the card.
            If (ICLASS)
            {
                  //Reverse all the bytes in case iClass card
            }
            Else
            {
                  //Do not reverse
            }
Step 2:
            If (MIFARE)     // 4 Byte CSN card
            {
                  //generate decimal from 4 Byte CSN.
            }
            Else if (DESFire) // OR any 7 BYTE CSN card
            {
                  //Add 0 in beginning of CSN
                  //reverse the first 4-bytes and reverse the next 4-bytes.
                  //reverse the whole 8-byte after above manipulation
                  //generate decimal from the manipulated HEX

            }
            Else //ICLASS CARD
            {
                  //reverse the first 4-bytes and reverse the next 4-bytes.
                  //reverse the whole 8-byte after above manipulation
                  //generate decimal from the manipulated HEX
            }
```

e. **HID card number:** if this option is selected, terminal read the HID card number from the iClass card.

NOTE: This option only available in iClass product.

3. Press on **Save** button to save changes

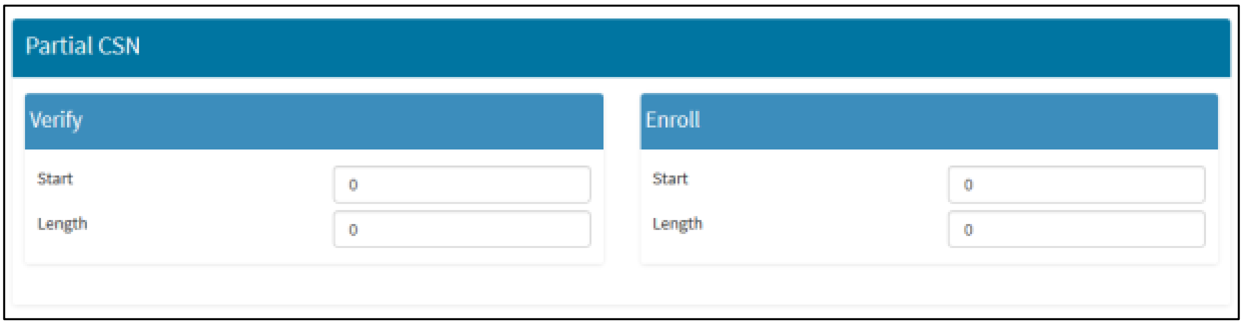
Configure Partial CSN

The administrator can set the value of start bit and length of bit i.e. total number of bit, to be used for Enroll and Verify, using this functionality.

Access Path

Webserver > Control Configuration > Contactless Card > Partial CSN Configuration

Screens & Steps



Partial CSN

Verify

Start: 0

Length: 0

Enroll

Start: 0

Length: 0

Figure 320: Configure Partial CSN for Enroll and Verify

1. Select **Start** & **Length** for **Enroll** and **Verify.**
   a. Default value of **Start** and **Length** is **0**
   b. **Start** can be configured in range **0 to 79**
   c. **Length** can be configured in range **0 to 80**
2. Press on **Save** button to save changes

Note: These keys are only used when the keys “Enroll” or “Verify” are set to “Reverse CSN” or “Standard CSN”.

Example
CSN card: 0xE012FFFB012D89FF
CSN Decimal value: 16146249067598285311
CSN Binary value:
1110000000010010111111111111101100000000100101101100010011111111
Truncated value, using interface we propose, with programmed start bit to 11 and length to 53

CSN Binary value: 10010111111111111101100000001001011011000100111111111
ID Decimal value: 5348003102427647

Defining Application ID and File ID for DESFIRE® Cards

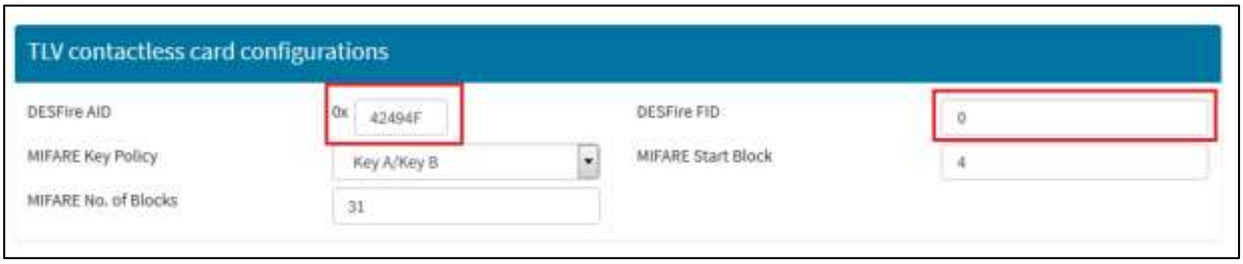
The administrator can specify the value of Application ID and File ID for reading DESFire® cards, using this functionality. When the DESFire® card is presented to the reader during authentication, the application ID is read from the configured location from where the active File ID is fetched which further contains the user data.

Access Path

Webserver > Control Configuration > Contactless Card > TLV contactless card configuration > DESFire AID

And Webserver > Control Configuration > Contactless Card > TLV contactless card configuration > DESFire FID

Screens & Steps



TLV contactless card configurations

DESFire AID: 0x 42494F
DESFire FID: 0
MIFARE Key Policy: Key A/Key B
MIFARE Start Block: 4
MIFARE No. of Blocks: 31

Figure 321: Configuring Application ID and File ID

1. Select Application ID
    a. Configure Application ID in range of 0x000001-0xFFFFFF.
    b. Default Application ID 0x42494F
2. Now select **File ID**
    a. Configure File ID in range of 0 – 31.
    b. Default File ID is 0
3. Press on **Save** button to save changes

Defining Offset for Reading iCLASS® Cards

The administrator can configure the offset to read the data from 2APP iCLASS® cards, using this functionality. When the iCLASS® card is presented to the reader, the application area 2 is read after the card is authenticated with the key 2.

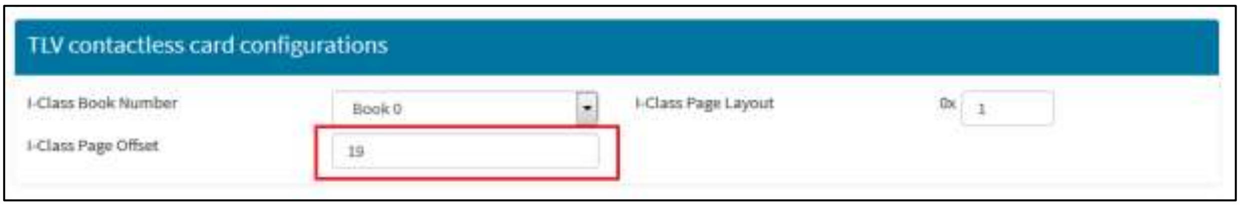
Access Path

Webserver > TLV contactless card configuration > I-Class Page Offset

Pre-requisites

- MorphoAccess® SIGMA Family Series iCLASS® or Morpho*Wave*® Compact MDPI terminal required to configure Offset for reading iCLASS® card

Screens & Steps



TLV contactless card configurations

I-Class Book Number: Book 0

I-Class Page Layout: 0x 1

I-Class Page Offset: 19

Figure 322: Set Key Offset for iCLASS® cards

1. Select **-Class Page Offset**
    a. Configure **Page Offset** in range of 0-255.
    b. Default **Page Offset** is 19
2. Press on **Save** button to save the Offset value

Defining Active Pages for Reading iCLASS® Cards

The administrator can configure the active page for reading data from 16APP iCLASS® cards, using this functionality. When the iCLASS® card is presented to the reader, the application area 2 is read after the card is authenticated with the key 2. Depending on the template and size of data stored, the number of pages shall be used in case the card is 16App iCLASS®.

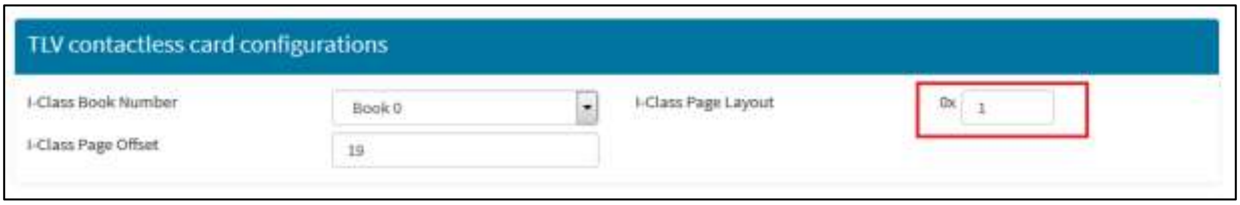
Access Path

Webserver > Control Configuration > Contactless Card > TLV contactless card configuration > I-Class Page Layout

Pre-requisites

- MorphoAccess® SIGMA Family Series iCLASS® terminal required to configure Active for reading iCLASS® card

Screens & Steps



TLV contactless card configurations

I-Class Book Number: Book 0

I-Class Page Layout: 0x 1

I-Class Page Offset: 19

Figure 323: Configure Active Pages for iCLASS® cards

1. Select I-**Class Page Layout.**
   a. Configure **Page Layout** in range of 0-5.
   b. Default **Page Layout** is 1
2. Press on **Save** button to save

Reset Card

The administrator can reset a contactless card. The user data stored in the card is erased, using this functionality. Terminal will also overwrite the current site key on the card with default.

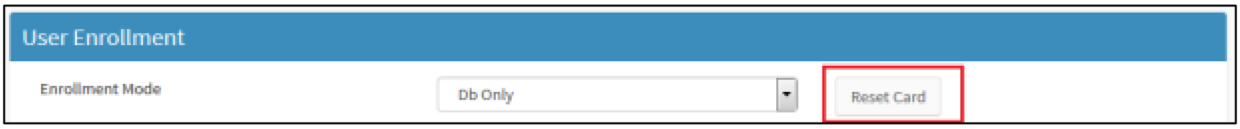
Access Path

Webserver > User Management > User Enrollment

Pre-requisites

- A smart card has user details stored
- Card is secured with the same key as on terminal

Screens & Steps



User Enrollment

Enrollment Mode: Db Only

Figure 324: Reset card

Click on **Reset Card**

1. Terminal will ask to **Place Card** at card reader.
2. Once an administrator places card, terminal will read and reset card by erasing data stored. And will set card key to default key.

Results

Card is reset successfully. Now a new user can be enrolled on this card.

Section 9 : **USB Scripts**

USB Scripts

MorphoAccess® SIGMA Family and *MorphoWave®* Compact terminal can be configured using encrypted USB scripts. These scripts can be created from MorphoBioToolbox. When user connects the USB drive which contains the USB scripts to the terminal, the intended operations will be performed and corresponding results will be written into the USB drive. User can check the result of executing these scripts with the help of **MorphoBioToolbox** to "Read response" functionality. Using this feature, user can change the configuration of those terminals which are not connected to the network. Please refer to the **MorphoBioToolbox** User guide for more details.

Note: User can use the same USB Scripts to configure one or more terminals. In such cases user needs to ensure that the result of each USB Script execution will overwrite the previous result.

User can create the following scripts, using MorphoBioToolbox:

- Get/Set IP Configuration
- Get/Set Wi-Fi Configuration
- Firmware Upgrade
- Error Log Configuration
- Retrieve Error Log
- Reset Configuration
- SSL Configuration
- Protocol Switch

Access Path

Access point	Access Path	SIGMA Series, SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
MorphoBio Toolbox	Login to MorphoBioToolbox > Device Settings > USB Scripts	✓	✓

Pre-requisites

- USB Drive

NOTE: USB mass storage key should not be partitionned but should contain only one drive.

Section 10 : **Access Control**

Access control presentation

Typical architecture of an access control system

Typical access control system architecture includes:

- One MorphoAccess® terminal per area for access control.
- A user management or administration menu.
- A Central Security Controller to take centralized decision, in order to provide physical access commands (open the door).

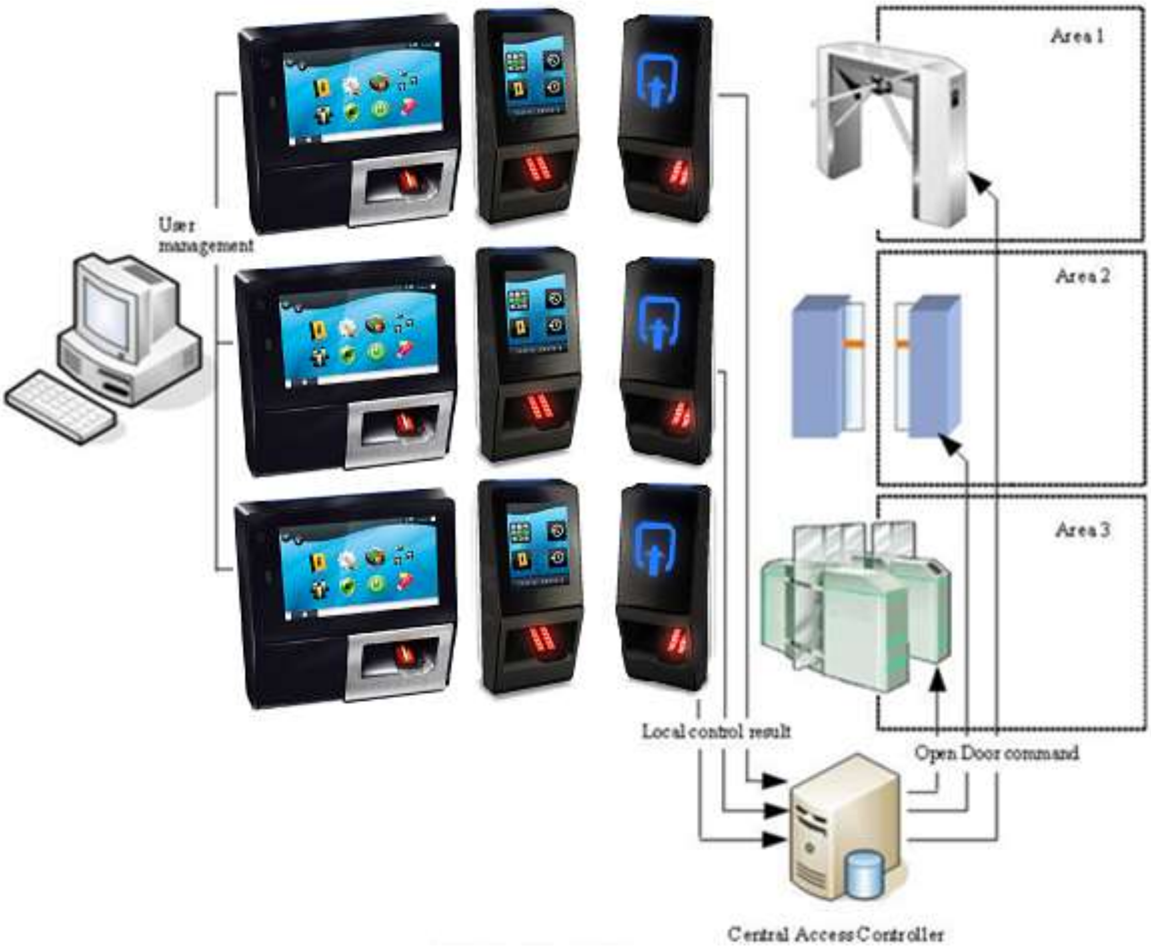


Figure 325: Typical access control system architecture for MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact

Typical access control process

1. The administrator must enroll all the authorized users. This means that a record is created for each user, containing a unique identifier and biometric data for two of his fingers.
2. When a user requests the access to the area, the terminal checks user’s access rights using a biometric check.
3. If the result of the check is successful (access granted), a message is sent to the Central Security Controller for additional access rights check.
4. If the user is allowed to access to the protected zone, the central access controller returns an "access granted" message to the terminal and an “open” command to the gate controller.

Preliminary: adding a biometric template in local database

Access point	Access Path	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
User Menu	Terminal Menu > User Menu	✓	✗
User Management Menu	Webserver > User Management Menu	✓	✓

For MorphoAccess® SIGMA Series / SIGMA Extreme Series & *MorphoWave®* Compact

The administrator can manage a biometric database in the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals by following the steps enlisted on the User Menu or by means of the User Management Menu of the Webserver. This includes User enrolment and encoding Contactless cards containing user templates.

The local database can be exported ciphered to other MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals using a USB Mass Storage Device.

For MorphoAccess® SIGMA Lite Series

The management of internal biometric database can be done externally (through the Webserver) in MorphoAccess® SIGMA Lite Series terminals. This includes generating contactless cards containing user templates and User enrolment.

The local database cannot be exported to other terminals via USB Mass Storage Device for MALite Series.

A message can be sent to a distant host from MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact to inform that changes were made on the internal biometric database of the terminal. These changes can be exported to the host centralized database.

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal operating modes

Standalone mode or Slave mode

Modes of Operation	SIGMA Series SIGMA Extreme Series Sigma Lite Series *MorphoWave®* Compact MDPI	*MorphoWave®* Compact MD
Standalone Mode	✓	✓
Slave Mode/Distant Commands	✓	✗

The MorphoAccess® SIGMA Family and *MorphoWave®* Compact MDPI terminals support two exclusive operating modes:

- **Standalone mode**, where the terminal runs an access control program that can make the access decision alone, or with the final authorization from a central access controller. This mode is described in detail, please refer to the section below,
- **Distant Command mode (slave)**, wherein a distant system runs an access control application that uses the high level functions of the terminal. This mode is described in detail in the Distant Command Mode section.

Standalone mode: Identification and/or Authentication

When in standalone mode, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact MDPI terminal supports mainly two types of access control processes. These can be used separately or together:

- The 'identification' process, starts when the user places his finger on the biometric sensor. This process is described in the "*Access Control by Identification*" section,
- The 'authentication' process, which starts with the communication of the User ID of user, for example by the presentation of a user's contactless card. Next step is the placement of user's finger on the biometric sensor. The terminal allows several authentication processes depending on the location of the reference biometric data, and on the level of security required. These processes are described in the "*Access Control by Authentication*" section.

Identification and authentication processes can also be activated at the same time, as described in "*Multifactor Access Control Mode*" section.

Access Control Process in Identification Mode

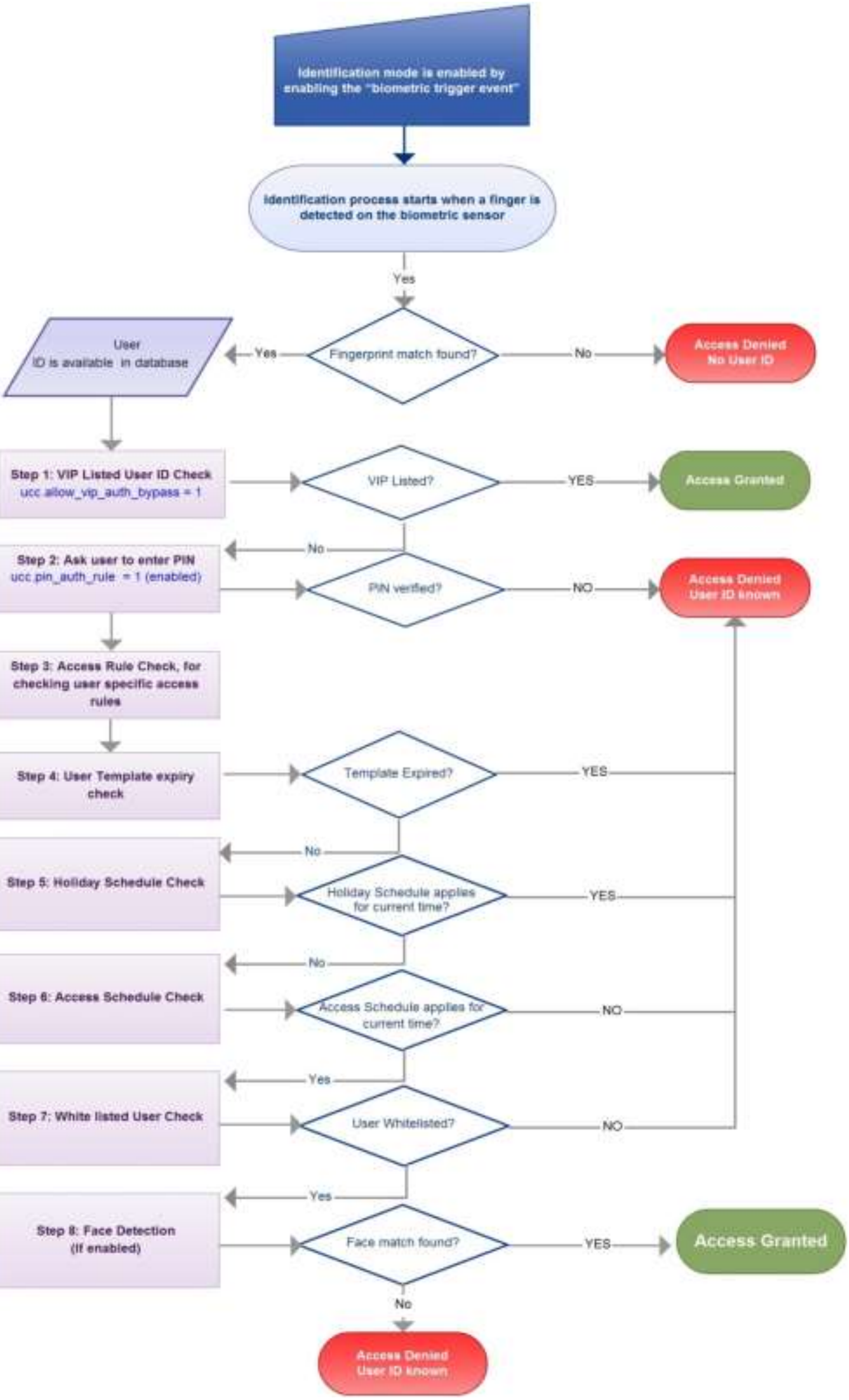

Identification mode is enabled by enabling the "biometric trigger event"
Identification process starts when a finger is detected on the biometric sensor
Yes
Fingerprint match found?
Yes
User ID is available in database
No
Access Denied No User ID
Step 1: VIP Listed User ID Check ucc.allow_vip_auth_bypass = 1
VIP Listed?
YES
Access Granted
No
Step 2: Ask user to enter PIN ucc.pin_auth_rule = 1 (enabled)
PIN verified?
NO
Access Denied User ID known
Step 3: Access Rule Check, for checking user specific access rules
Step 4: User Template expiry check
Template Expired?
YES
No
Step 5: Holiday Schedule Check
Holiday Schedule applies for current time?
YES
No
Step 6: Access Schedule Check
Access Schedule applies for current time?
NO
Yes
Step 7: White listed User Check
User Whitelisted?
NO
Yes
Step 8: Face Detection (if enabled)
Face match found?
YES
Access Granted
No
Access Denied User ID known

Figure 326: Access Control Flow Diagram when Terminal is in Identification Mode

Access Control Process in Authentication Mode

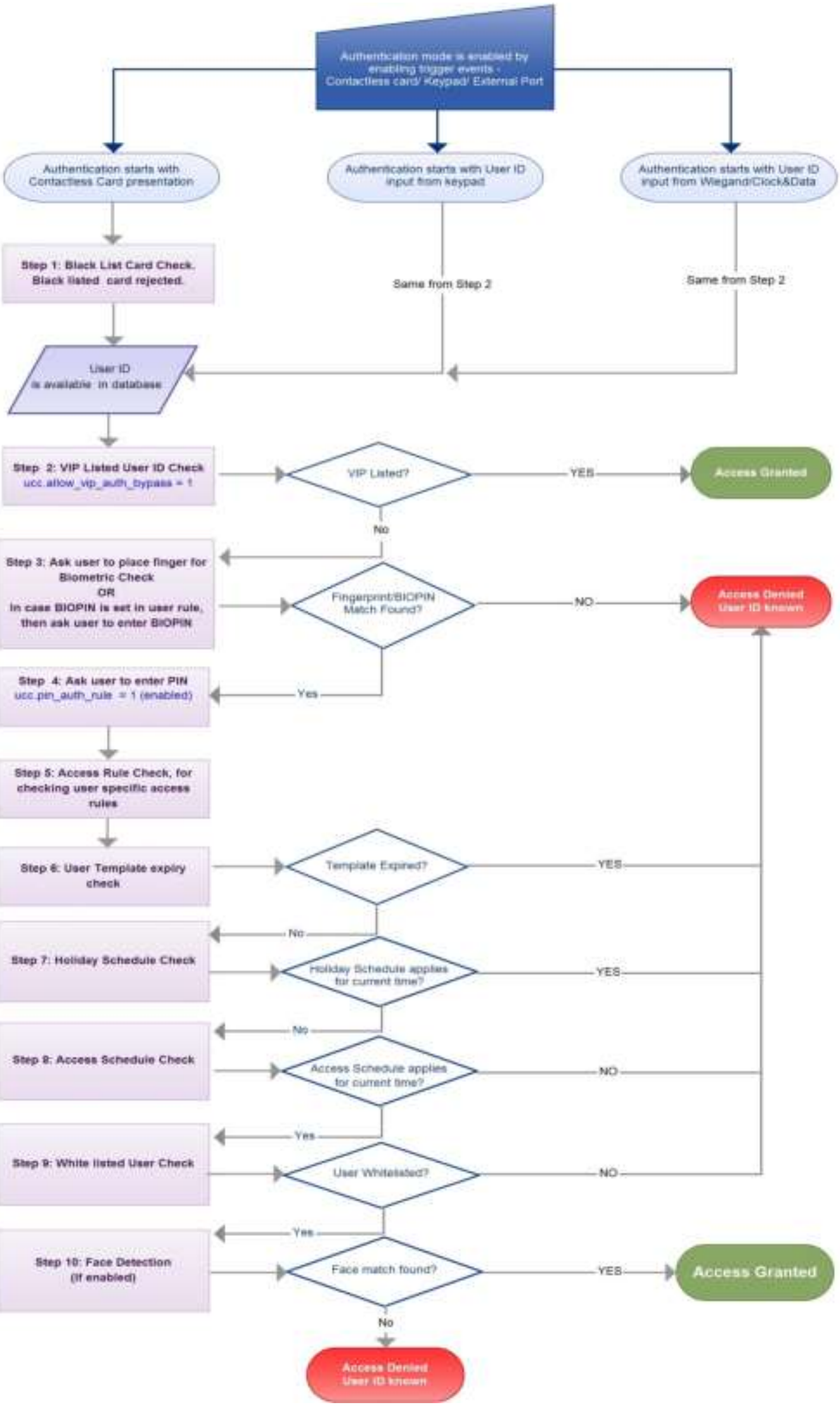

Authentication mode is enabled by enabling trigger events - Contactless card/ Keypad/ External Port
Authentication starts with Contactless Card presentation
Authentication starts with User ID input from keypad
Authentication starts with User ID input from Wiegand/Clock&Data
Step 1: Black List Card Check. Black listed card rejected.
Same from Step 2
Same from Step 2
User ID is available in database
Step 2: VIP Listed User ID Check
ucc.allow_vip_auth_bypass = 1
VIP Listed?
YES
Access Granted
No
Step 3: Ask user to place finger for Biometric Check
OR
In case BIOPIN is set in user rule, then ask user to enter BIOPIN
Fingerprint/BIOPIN Match Found?
NO
Access Denied User ID known
Yes
Step 4: Ask user to enter PIN
ucc.pin_auth_rule = 1 (enabled)
Step 5: Access Rule Check, for checking user specific access rules
Step 6: User Template expiry check
Template Expired?
YES
No
Step 7: Holiday Schedule Check
Holiday Schedule applies for current time?
YES
No
Step 8: Access Schedule Check
Access Schedule applies for current time?
NO
Yes
Step 9: White listed User Check
User Whitelisted?
NO
Yes
Step 10: Face Detection (If enabled)
Face match found?
YES
Access Granted
No
Access Denied User ID known

Figure 327: Access Control Flow Diagram in Authentication Mode

Note: *Face detection applies only for MorphoAccess® SIGMA and SIGMA Extreme Series terminal.*

Access Control Process for VIP Users

If the administrator lists a user as VIP, the access control flow for that user will differ from the general access control flow. When a user is enrolled as VIP and the VIP bypass is enabled, then the VIP user is exempted from authentication using biometric data, PIN, BIOPIN or Face detection.

The Access Control Process for VIP users has following steps:

1. A user can initiate access request by placing card or finger
2. Once identified as a VIP user, terminal will not ask for any biometric data
3. Other checks such as (if configured), access schedule, holiday schedule, banned card, authorized list, expiry date, trigger event check, etc. are done as per the authentication process. Please refer to Step 5 in *Access Control Flow Diagram in Authentication Mode*
4. On successful authentication, access is granted to a VIP user

Note: If the access request is triggered from keyboard or external source like Wiegand string, then the user authentication process will be conducted using biometric/PIN check.

Configuration Key

Parameter Name	Parameter Value	Description
ucc.allow_vip_auth_bypass	0 or 1	The administrator can enable or disable VIP user authentication bypass for threat level 0 by using this parameter. If this parameter is set to “0”, VIP user authentication bypass is not allowed. VIP users have to input fingerprint and access is granted only on successful authentication. If this parameter is set to “1”, VIP user authentication bypass is allowed. A VIP user is granted access without authentication checks.

Access Control Result

Information for the User

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal communicates the result of the access right check by a local audible and visible signal. These signals are described in the "*Audio Man Machine Interface*" section.

For example:

- when the access is granted, the terminal emits a high pitched note,
- when the access is denied, the terminal emits a low pitched note.

NOTE: The duration to display Access control result messages on terminal LCD, can be configured using the 'time_and_attendance.tna_message_timeout' parameter.

For more information about this parameter, please refer to **MorphoAccess® 5G Series – Parameters Guide.**

Information for the Administrator

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal creates a record for each access request, in an internal log file. Each record contains the date and the time, the user's identifier (if available), and the result of the local access control check.

This feature is described in the "*Access Request Result Log File*" section.

Integration in an Access Control System

At the end of the access rights control, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to:

- Send a message, with data related to the access request. This feature is described in the "*Sending the access control result message*" section,
- Activate an internal relay (if the access is granted to the user), as described in "*Internal Relay activation on Access Granted result*" section.

The format of the messages (which includes the user's identifier) that is sent to the distant system is described in the **MorphoAccess® 5G Series – Remote Message Specification** document.

Access Granted

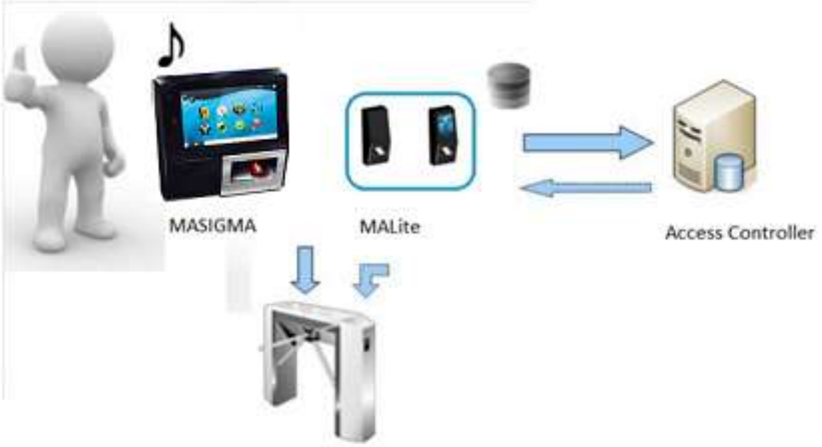


Figure 328: Access Granted Diagram for MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact

Access Denied

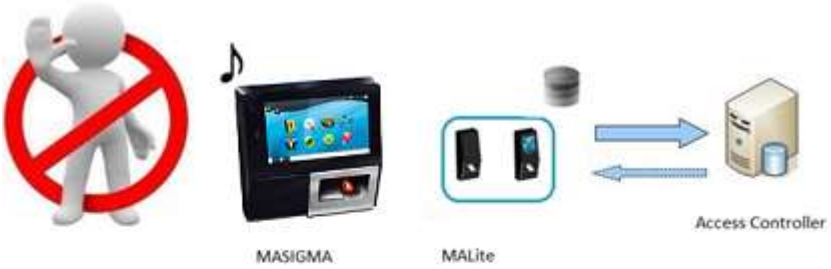


Figure 329: Access Denied diagram for MorphoAccess® SIGMA Family Series, *MorphoWave®* Compact

Section 11 : **Access Control by Identification**

Identification Mode Description

Identification Process

The identification process consists in retrieving the identity of an unknown person, by comparing the data (presented by the unknown person) with a database that contains similar type of personal data of known persons. At the end of the process, the person is either identified (identity found), or still unknown.

Access Control by Identification

The 'Identification' process on the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal begins by comparison of the biometric data of the finger placed on the biometric sensor, with the biometric data of all the fingers stored in the database.

It means that the biometric data of the allowed users must be stored in the internal database before they can request the access on the terminal. This biometric data is acquired directly on the terminal (using the Administrator interface), using the biometric sensor.

The access control by identification process is started when a finger is detected on the biometric sensor

When the user requests the access, his identity is unknown, and it is the terminal that searches for his identity. The terminal grants the access if a match is found (the user is identified); otherwise the access is denied (the user remains unknown).

Result of the access control request

The result of the access right control is indicated by an audible and visible signal emitted by the terminal. These signals are described in the **"***LED Buzzer Sequence***"** section.

User's Data required in the terminal

This mode requires that all authorized users must be enrolled in the internal database of the terminal. It means that there is one record per user: each user record contains a unique identifier and the biometric data of two different fingers of the user.

For more information on the management of the internal database, please refer to the "*MorphoAccess® Terminal Database Management*" section.

Identification Modes (database extension licenses)

Identification process relies on the database. User data is stored at the time of enrolment and this serves as a reference for the identification process. For more details on database of MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals, please refer to "*database* *size*" section. By default the biometric data of two fingers per user record is stored. The maximum database capacity can be extended by installing specific licenses. For more details on supported licenses, please refer to "*Terminal License Management*" section.

Compatibility with Access Control Systems

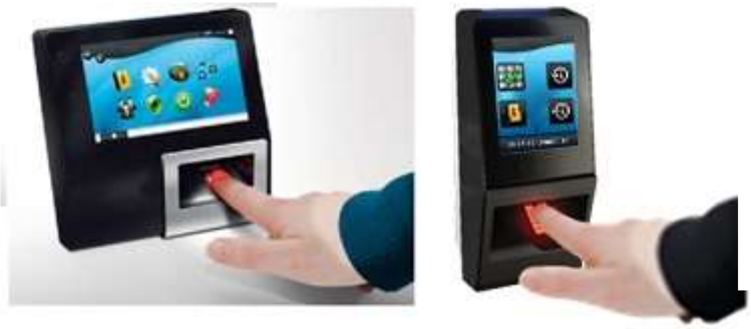
When the identification mode is activated, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal supports the optional features listed below:

- internal relay activation when the access is granted, as described in "*Internal Relay activation on Access Granted result*" section,
- external activation of the internal relay, as described in "*External activation of the internal relay*" section,
- send access control result message to a distant system, as described in "*Sending an Access Control Result Message*" section

User Interface

In this mode, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal waits for the placement of a finger or the swipe of an hand on the biometric sensor. This state is displayed to the user by a specific signal, as described in "*Terminal States*" section.

The identification process begins when the user's finger is detected on the biometric sensor.



Place finger on biometric sensor

Figure 330: Identification Mode

The biometric data are captured, and then compared to the biometric database on the terminal

- If a match is found, then the user is identified (the terminal has its identifier) and access is granted to the user.
- Otherwise, if no match found, the user remains unknown (the user's identifier is unavailable), and the access is denied.

The result of the identification process is notified to the user by a specific signal, as described in "*Terminal States*" section.

When the identification process is completed, whatever is the result (identified or not identified), the terminal automatically goes back to its initial state: This implies that it will wait for finger to be placed on the biometric sensor.

When the administrator has not enrolled any users into the terminal database, the identification process is disabled. None of the users are granted access. The terminal notifies this invalid state to the user as described in "*Terminal States*" section.

Section 12 : **Access Control by Authentication**

Authentication Process

Introduction

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal offers an authentication mode designed to work with contactless smart cards. These contactless smart cards are used as personal cards.

Then this section relates only to terminals equipped with a contactless smartcard reader (see section *Scope of the document*).

In the whole document the word ‘card’ refers to ‘contactless smart card’.

Authentication process

Unlike the ‘identification’ mode, the User Identity must be known in order to execute the authentication process.

Authentication is an identity verification process: the user provides his identity and the terminal checks it with the relevant process.

This mode doesn’t compare the user’s data to the data of several users. It instead compares the data provided by the user with the reference data provided by the same user during the enrolment phase.

Access control by authentication

To provide his identity, the user presents his personal identity card that contains the User ID. This action starts the authentication process.

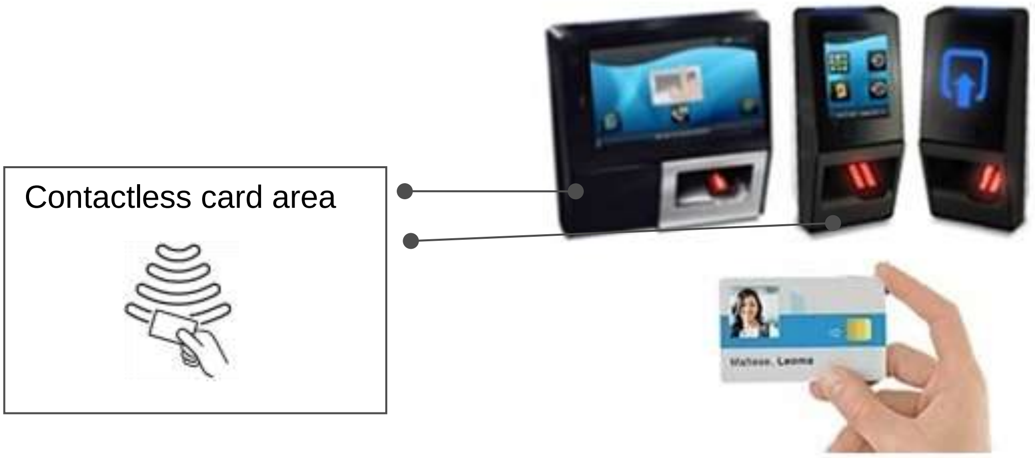


Figure 331: Users trigger the authentication process by showing their card

The user's card must contain the user's identifier and optionally his biometric data.

The terminal performs the required identity checks using the data read on the user's card, and if required, data stored in the internal database.

When the 'biometric check' is required, the captured biometric data is compared with the reference biometric data of the user, acquired during enrolment process.

If a match is found, the result of the biometric check is positive, i.e., user's identity is confirmed. Otherwise, the result of the biometric check is negative, i.e., user's identity is not confirmed.

The access is granted only to authenticated users (user's identity confirmed).

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal allows the 'identification' and 'authentication' modes to begin concurrently, as specified in "*Multifactor Access Control Mode*" section.

Contactless Smart Card

The terminal ignores contactless cards encrypted with unknown 'Card-terminal' authentication keys. The terminal shall not allow access if the user authentication key on the 'card' does not match with the corresponding key stored in the terminal database.

The terminal rejects user's cards without the data required by the authentication process selected.

All authentication modes begin with a valid User ID. The other data that is required to complete authentication depends on the authentication mode that is selected.

All non-mandatory data found on the user's card is ignored.

List of contactless cards validated

For MorphoAccess® SIGMA Series Multi & iClass, *MorphoWave®* Compact MD and MDPI, please refer to the **MorphoAccess® terminals Contactless Card Specification** document.

Authentication Process Options

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal offers several authentication methods depending on the reference biometric data location of a user and the level of security required.

The user's reference biometric data can be located:

- Either on his personal card, as described in "*Biometric check, biometric data on user's card*" section,
- Or in a record of the internal database, as described in "Biometric check and biometric data in local database" section

Additionally the administrator can disable the biometric check as specified in the sections "*Manual bypass of biometric control*" and "*Automatic bypass of biometric control*".

Manual bypass of biometric control

The administrator can disable the 'Biometric control', which is enabled by default. The administrator can also define a user rule for a particular user. In this rule, the trigger event through biometric can be disabled while the trigger event through 'Card' can be enabled.

For per user rule configuration, refer to "*User Enrollment in Database*" section.

When the administrator has enabled the Bypass Biometric Check in a user profile, terminal will behave as below:

- The terminal doesn't require the user to place a finger on the biometric sensor. The access is granted without a biometric check.
- According to the authentication process selected, the terminal doesn't perform any check on the user's identifier, as described in section "*No biometric check, no User ID check*"
- The terminal checks that the user's identifier is in the terminal database, as specified in the section "*Biometric check and biometric data in local database*"

Automatic bypass of biometric control

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal offers an authentication mode which depends on the content of the user's 'card'.

The terminal searches the user card for data to ascertain if biometric control is mandatory or not.

This authentication mode is described in section "*Authentication process specified by User's card*".

Result of access control check

The result of the access control check is notified to the user by audible and visible signals, as described in the "*Terminal User Interface*".

Compatibility with Access Control Systems

When the identification mode is activated, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal supports the optional features listed below:

- internal relay activation when the access is granted, as described in "*Internal Relay activation on Access Granted result*" section,
- external activation of the internal relay, as described in "*External activation of the internal relay*" section,
- send access control result message to a distant system, as described in "*Sending an Access Control Result Message*" section

Biometric check, biometric data on user's card

Description

In this mode, each user's card contains an identifier and the biometric data of two different fingers of the user. The terminal compares the biometric data of the finger placed on the biometric sensor, with the reference biometric data of the two user's fingers read on the card. If a match is found, the access is granted, otherwise the access is denied.

This authentication mode doesn't use the internal database of the terminal as a reference.

If required, the biometric check can be disabled, as described in the "*No biometric check, no User ID check*" section.

User's data required in the terminal

Since the data on the 'card' is used as a reference source, the internal database of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is not used. This implies that the administrator need not encode any of the user information onto the terminal database at the time of enrolment.

User's data required on the user's card

The administrator must encode at leat the following information into the user's card.

- the user's identifier (User ID),
- The biometric data of user's fingers.

The data on the card must comply with the TLV format, as described in the **MorphoAccess® terminals Contactless Card Specification** document.

Activation key

- The administrator needs to ensure that the 'card' Type selected at the time of User Enrolment must be able to accommodate at least the User ID + Biometric.
- Using Terminal Menu or Webserver, the administrator can configure the User Record Reference parameter appropriately. This is to enable the usage of 'card' for authentication. Please refer to "*User Enrolment in Database*" *(Step: 37)*.

User Interface

The authentication process starts when the user presents his contactless card in front of the terminal (where the antenna of the contactless card reader is located). If it is compatible (same authentication keys, and mandatory data present on card), the user will be invited to place his finger on the biometric sensor, for biometric authentication.

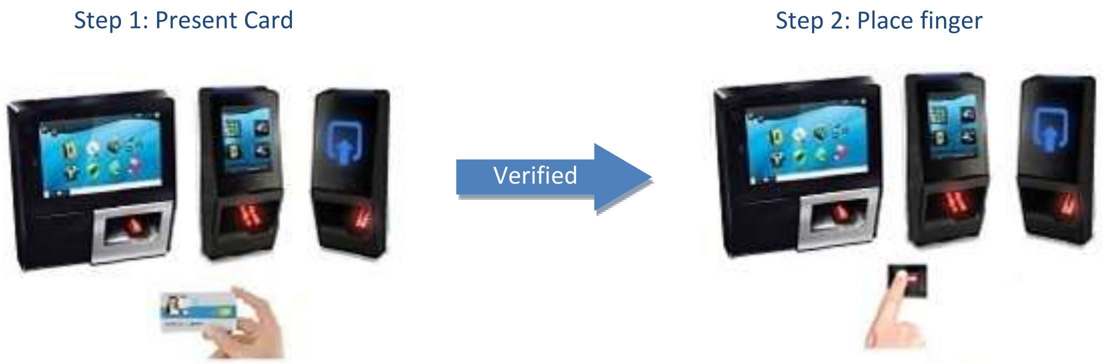


Figure 332: Authentication with user's fingerprints on contactless card

The terminal compares the captured biometric data, with the reference finger data on user's card.

The authentication process is successful (identity confirmed) if the captured biometric data matches with one of the reference finger data. The authentication process fails (identity not confirmed) if the captured finger data does not match.

The result of the authentication process is notified to the user by a specific signal, as described in "*Terminal States*" section.

On completion of the authentication process, irrespective of the outcome, the terminal will automatically go to its initial state. This implies that it will wait for another user's card to be detected.

PIN verification - PIN stored on card

Description

In this mode, each user's card contains a User ID, unique PIN Code and the biometric data of two different fingers of the user. The terminal detects the user by means of the User ID on his 'card'. For authentication, it compares the entered PIN Code with the corresponding PIN on the user's card. The terminal will now expect the user to place his finger on the biometric sensor, provided biometric checks are enabled and the PIN has matched. The captured image of the fingerprint is then compared with the reference biometric data on the card. If a match is found, the access is granted, otherwise the access is denied. The administrator needs to carefully encode the User ID, PIN Code and biometric data of two fingerprints at the enrolment time

This authentication mode doesn't use the internal database of the terminal as a source of reference.

If required, the biometric check can be disabled, as described in the "*No biometric check, no User ID check*" section.

Note: This section is applicable for MorphoAccess® SIGMA, SIGMA Extreme and SIGMA Lite+ Series terminal only.

User's data required in the terminal

This authentication mode doesn't use the internal database of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal as a source of reference. Hence the administrator need not encode the user information into the terminal database.

User's data required on the user's card

For this mode of authentication to work correctly, the administrator must correctly encode the following information into the user's card. This must be carefully done at enrolment time.

- User ID (Identifier)
- User PIN
- The biometric data of user's fingers.

The data on the card must comply with the TLV format, as described in the **MorphoAccess® terminals Contactless Card Specification** document.

Activation key

- The administrator must select a ‘card’ type that can accommodate at least “User ID + PIN” or “User ID + Biometric + PIN”. This needs to be done at user enrolment time.
- The administrator needs to configure the User Record Reference parameter appropriately such that it indicates using a ‘contactless smart card’ for authentication. This can be done via Terminal Menu or Webserver. Please refer to “*User Enrolment in Database*” *(Step: 37)*

User Interface

The authentication process starts when the user presents his contactless card in front of the terminal (where the antenna of the contactless card reader is located). If it is compatible (same authentication keys, and mandatory data present on card), the user is invited to enter the PIN, for PIN Verification.

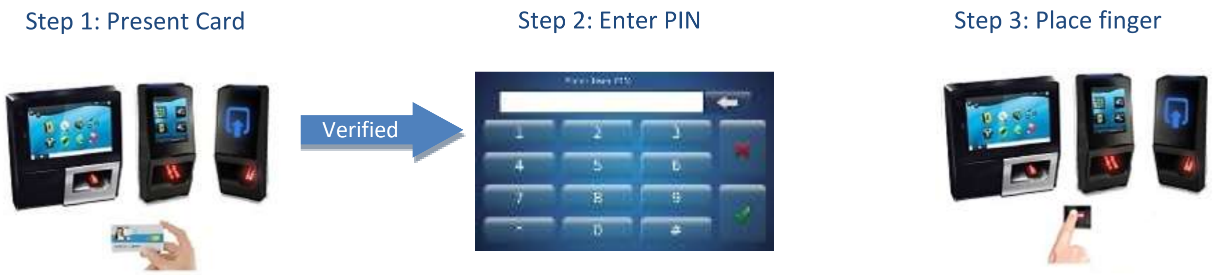


Figure 333: Authentication with user's PIN Code and fingerprints on contactless card

The user is expected to put his finger on the biometric sensor or swipe his hand for (biometric) authentication, provided PIN Code is verified, and biometric check is enabled. The terminal compares the biometric data of the finger placed on the sensor, with the reference biometric data on the user’s card.

The authentication process is successful (identity confirmed) if the PIN is verified and the captured finger data matches with one of the reference finger data. The authentication process fails (identity not confirmed), if the pin and/or biometric data does not match.

The result of the authentication process is notified to the user by a specific signal, as described in “*Terminal States*” section.

The terminal reverts to its initial state, when the authentication process is completed, irrespective of its outcome. This implies that the terminal will now look for another card detection.

BIOPIN verification - BIOPIN stored on card

Description

In this mode the card should contain a Biometric PIN (BIOPIN). The goal of this mode is to substitute fingerprint based authentication by BIOPIN based authentication. This is useful when the fingerprints of the user are not available during enrolment for some reason. The administrator must enroll the user with a User ID and BIOPIN. Authentication process begins when the user presents card at the card reader on the terminal followed by entering BIOPIN. If the entered BIOPIN matches with the BIOPIN stored in the card, access is granted. This authentication mode does not use the database of the terminal.

The administrator can enable this feature in order to support two kind of users in the same access control system, i.e., normal user with fingerprints (biometric check), and special user without fingerprints but with a BIOPIN (BIOPIN checking instead of fingerprint matching).

Note: This section is applicable for MorphoAccess® SIGMA, SIGMA Extreme and SIGMA Lite+ Series terminal only.

User’s data required in the terminal

The administrator need not encode user information on the terminal database in this mode. Since this mode does not use the internal database of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, as a reference source.

User’s data required on the user’s card

The administrator must encode the following on the user’s card for this mode to work successfully.

- User’s identifier (User ID),
- User BIOPIN

The data on the card must comply with the TLV format, as described in the **MorphoAccess® terminals Contactless Card Specification** document.

Activation key

- The administrator must select a Card Type that can accommodate at least User ID + BIOPIN, at the time of enrolment.
- The administrator needs to correctly configure the User Record Reference parameter value to enable authentication using smart card, from the Terminal Menu or Webserver application. Please refer to “*User Enrolment in Database*” *(Step: 37).*

- Following parameter is required to be configured:

Parameter Name	Parameter Value	Description
ucc.allow_biopin_user_rule	0, 1, 2	"0", to disable BIOPIN check "1", to enable BIOPIN check "2", to set PIN check

User Interface

The authentication process starts when the user presents his contactless card instead of placing his fingers on the biometric sensor of the terminal. The card is placed near the antenna of the contactless card reader. If it is compatible (same authentication keys, and mandatory data present on card), the user is asked to enter Biometric PIN (BIOPIN) using keypad, instead of requesting the user to place his finger on the biometric sensor.

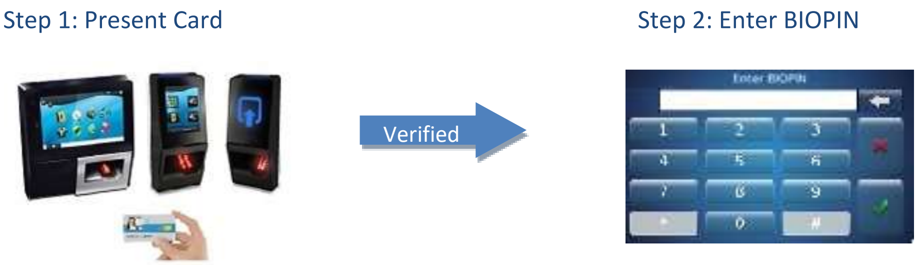


Figure 334: Authentication with user's BIOPIN on contactless card

The terminal compares the BIOPIN entered, with the BIOPIN read from user's card.

The authentication process is successful (identity confirmed) if the entered BIOPIN matches with the BIOPIN stored on user's card.

The result of the authentication process is notified to the user by a specific signal, as described in "*Terminal States*" section.

The terminal reverts to its initial state, when the authentication process is completed, irrespective of its outcome. This implies that the terminal will now look for a card detection.

Biometric check and biometric data in local database

Description

In this mode, only the User ID is read from the card. The biometric data of two fingers of the user are stored in the internal database, with the same User ID as the one on the user's card.

The terminal compares the biometric data of the finger placed on the biometric sensor, with the user's biometric data found in the database (in user's record). If a match is found, the access is granted, otherwise, (no match found) the access is denied.

User's data required in the terminal

Since this mode uses the terminal's internal database for reference, the administrator must encode the following user information at the time of enrolment.

- Same User ID on the terminal as on the card.
- The biometric data of user's fingers.

If the user's identifier, read on the user's card, is not found in the database, then the access is denied.

The size and the management of the internal database are described in "*MorphoAccess® Terminal Database Management*" section.

User's data required on the user's card

The only data required on the user's card is the User ID (user's identifier). All other data is ignored.

The TLV format is described in the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals Contactless Card Specification document.

Activation key

- The administrator must select a Card Type that can accommodate User ID.
- The Trigger event corresponding to 'Card' must be set to ON
- The administrator needs to configure the User Record Reference parameter value to Card for authentication using terminal database, by using Terminal Menu or Webserver. Please refer to "*User Enrolment in Database*" *(Step: 37)*.

User interface

The authentication process starts when the user presents his contactless card in front of the terminal (where the antenna of the contactless card reader is located). If the user's identifier read on the card is found on the terminal's internal database, then the user will be asked to place his finger on the biometric sensor or swipe his hand, for biometric authentication.

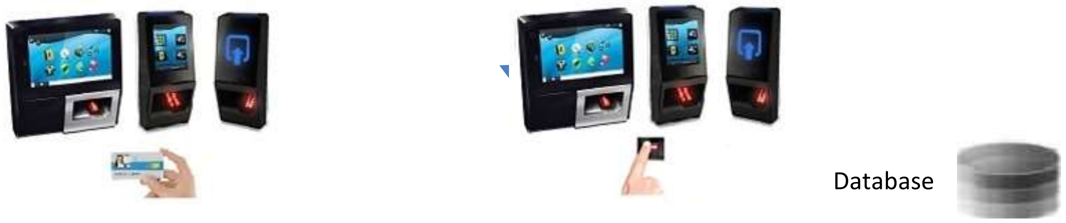


Figure 335: Authentication with biometric check, reference in database

The terminal then compares the captured biometric data with the reference biometric data found in the terminal database.

The authentication process is successful (identity confirmed), if the captured biometric data matches with one of the reference finger data. Authentication fails, if the captured biometric data does not match the corresponding one in the terminal database.

The result of the authentication process is notified to the user by an audio signal, as described in "*Terminal States*" section.

The terminal reverts to its initial state, when the authentication process is completed, irrespective of its outcome. This implies that the terminal will now look for a card detection.

When no users have been enrolled in the database, the authentication process is disabled. Users are not allowed access in this mode. The terminal notifies this invalid state to the user, as described in "*Terminal States*" section.

Authentication with local database: User ID entered from keyboard

Description

In this mode, the User ID is entered using the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal keyboard. If the User ID exists in the database, the terminal performs an authentication using the biometric templates associated to this User ID.

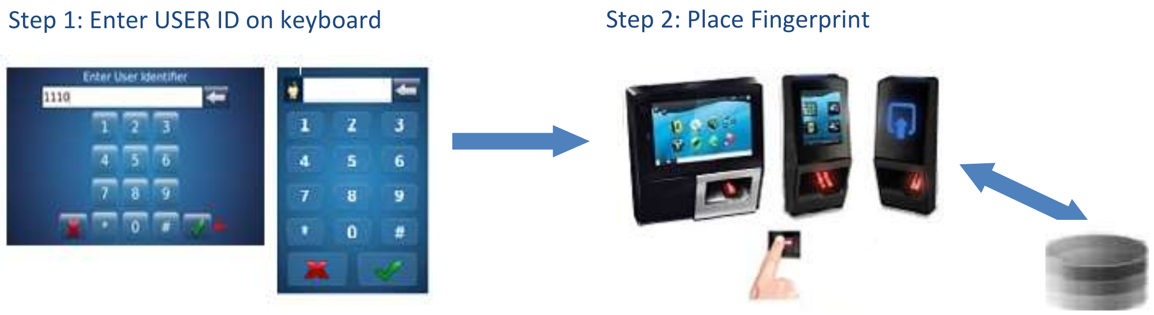


Figure 336: Authentication with User ID entered from Keyboard and biometric check

The authentication process starts when the user enters User ID, using keyboard on terminal. If the user's identifier is found on the terminal's internal database, then the user will be requested to place his finger or swipe his hand on the biometric sensor, for biometric authentication.

The terminal then compares the captured biometric data of the finger with the reference biometric data found in the terminal database. The authentication process is successful (identity confirmed) if the captured biometric data matches with one of the references finger data. If no match is found, the authentication process fails (identity not confirmed).

Note: This section is applicable for MorphoAccess® SIGMA, SIGMA Extreme, SIGMA Lite+ and *MorphoWave®* Compact Series terminals only.

Activation key

- The administrator needs to enable 'Keypad' as the Trigger event.
- The administrator needs to configure the User Record Reference parameter to 'Card for authentication using terminal database', by using Terminal Menu or Webserver. Please refer to "*User Enrolment in Database*" *(Step: 37)*.

Authentication with local database: ID input from Wiegand or Clock & Data

Description

This mode requires an external card reader that will send the User ID to authenticate to the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal through Wiegand or Clock & Data input.

The default screen invites the user to pass his badge so the external reader sends the User ID to the terminal's Wiegand or Clock & Data input. If the ID exists in the database, the terminal 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 the Central Access Controller.

Once the user authentication is done, terminal automatically loops back and waits for a new input ID. If the identifier sent by the reader is not present in the local database, authentication is not launched.

Activation key

The activation of this mode is controlled by following parameter:

Parameter name	Value	Description
ucc.trigger_event	1 to 31	Use this parameter to enable finger, contactless, keypad, external port trigger and QR code trigger. Only when external port trigger is enabled, the terminal would receive trigger from Wiegand or Clock & Data. • Set '8' to enable External Port **Note:** Set Trigger Event through "*Configure Trigger Events*" through Terminal. QR code feature is not supported for MorphoAccess® Sigma family terminals and the key value can be 1 to 15.
wiegand.external_port_input_type	0 or 1	Storing current external port input type as:

Parameter name	Value	Description
		• Set '0' for Wiegand format input (default) • Set '1' for Clock & Data format input
wiegand.external_port_output_status	0, 1 or 2	To enable/disable Wiegand output functionality. • Set '0' to never send data using Wiegand Port • Set '1' to always send data using Wiegand Port (default) • Set '2' to send data only when verification is initiated from Wiegand source
wiegand.external_port_output_type	0 or 1	Storing current external port output type as: • Set '0' for Wiegand format output • Set '1' for Clock & Data format output

References

- Wiegand Parameters are configurable from Webserver; refer to "*Wiegand Parameter Settings*" in this guide.
- You can also refer **MorphoAccess® 5G Series – Parameters Guide** for complete list of Wiegand parameters.

Wiegand Frame Configuration

When set up to communicate with Wiegand protocol, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal can handle several data formats for reading Wiegand string; refer to "*Wiegand Format and Associated Values*".

The default format of Wiegand string is Standard 26 Bits. An authentication is initiated through User ID input from Wiegand string, which consists below information:

- **Total Bits**: The number of Wiegand bits in the Wiegand string (maximum 512 bits length)
- **ID Start Bit**: the start bit of the ID Field (where the first bit is Bit 0)
- **Total ID Bits**: the number of bits in the ID Field (must be contiguous bits).

Using these parameters, when a card is presented to the terminal, it attempts to decode the ID Field and uses that information as the User Identifier (User ID of a template). All Site codes, Parity, and any other data are ignored.

Using the decoded ID, the terminal will verify corresponding User IDs stored in the database.

If the ID is not found in the terminal database, the verification attempt fails and Wiegand output string is set to the Wiegand Port in the configured format. There is no communication with central access controller.

If the ID is valid and a successful verification is performed, the Wiegand Output String is sent to Wiegand port in the configured format.

Note: For sending Wiegand Output, it is required to enable 'Activate Wiegand Output' parameter from Webserver. If this parameter is disabled, then no Wiegand output is sent by terminal in the event of a verification fail or pass.

Site-code Propagation

Site code propagation allows the usage of site code received from Wiegand input frame and apply the same to the output Wiegand frame. Configuration key “wiegand.site_code_propagation” is used to enable site code propagation

0 - Disable site code propagation (Default)

1 - Enable site code propagation

Site code is stored each time, authentication happens. It is extracted from a Wiegand input frame and Prox card. This site code will be used as output site code in the Wiegand frame corresponding to the **“wiegand.event_verify_fail”** and **“wiegand.event_verify_pass”** formats. For more details, please refer to Site-code Propagation section on **MA SIGMA - Application note - Wiegand formats**.

Wiegand frame example (26 bits)

For Standard 26 bit - [(26, 9, 16) (1, 8, 10) P1 = (0, Even, 1-12) P2 = (25, Odd, 13-24)],

Wiegand string sent from Terminal 1 to terminal2 will be as below:

0	1	2	3	…	8	9	10	11	12	…	23	24	25
Parity 1	SITE					ID							Parity 2
0	8 bits					16 bits							1

Here,

- **(26,9,16):** consists ID total length, ID start bit, ID length
- **(1,8,10):** consists Site code start bit, length, value
- **Parity1 (P1)**: Even parity calculated on 0 bit from 1 to 12 bit. Parity Bit is a check whether the data sent from one device to other is same.
- **Parity2 (P2):** Odd parity calculated on 25 bit from 13 to 24 bit

No biometric check, no User ID check

Description

This authentication mode is a version of the "*Biometric check, biometric data on user's card*" authentication mode, such that the biometric check is disabled.

When the administrator enables this mode, the terminal searches only for the User ID on the user's card. No other check is performed, i.e., the user's identifier is not searched in the terminal database and no biometric checks are performed.

This mode of authentication comes handy when there is no need (for a short term visitor) or it is impossible (physically or legally) to perform biometric authentication. These kind of cards can be encoded (with a unique User ID) without user's presence and the same card can be used for different visitors.

The internal database of the terminal is not used. The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal acts as a simple contactless card reader that only looks for the User ID.

The access is granted provided the user's card is encrypted with the authentication keys stored in the terminal and the terminal is able to read the User ID. Otherwise, the card is ignored and the access is denied.

User's data required in the terminal

The administrator need not encode any data in the terminal, while in this authentication mode. This is because the terminal's database is not used as a reference for user authentication.

User's data required on the user's card

In order to be compatible with this mode of authentication, the administrator must correctly encode the User ID into the user's card. It can be in a TLV structured data, or a Binary data to be read on the card (MIFARE® card only).

- All other data is ignored.

The TLV format is described in the **MorphoAccess® terminals Contactless Card Specification** document.

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal doesn't perform any check on the value of the user's identifier.

Activation key

- The administrator needs to select the Card Type, such that it can accommodate User ID. This must be ensured at the time of user enrolment.
- The administrator needs to correctly configure the **User Record Reference** parameter by using Terminal Menu or Webserver. The value should be such that authentication mode is chosen via 'card'. Please refer to "*User Enrolment in Database*" *(Step: 37)*.
- If no PIN check and no biometric check are required for a given user, it is best to provide him with a Visitor card. For more details, please refer to "*Encode Visitor Card*"

User Interface

The authentication process starts when the user presents his contactless card to terminal. As shown below:

To provide his identity, the user presents his personal identity card that contains the User ID. This action starts the authentication process.

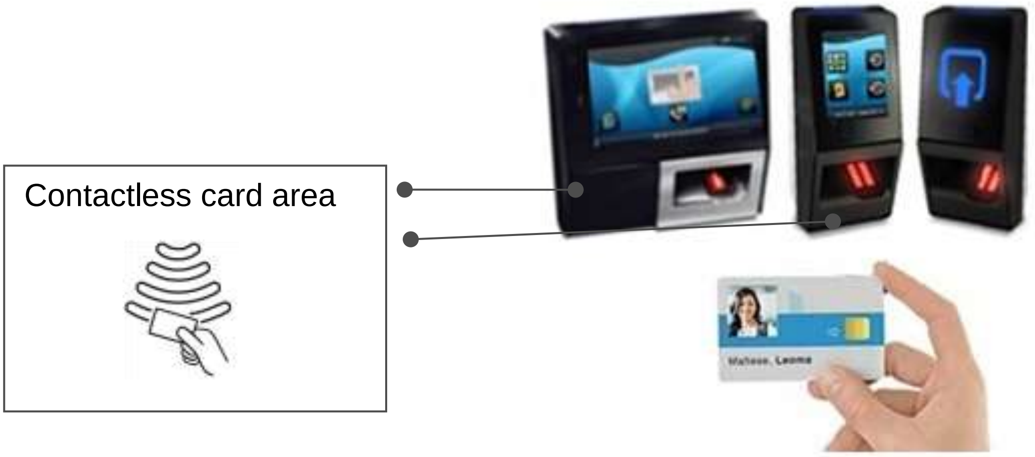


Figure 337: Authentication without biometric check and with User ID check in card

The authentication process succeeds if the user's identifier is found. Otherwise, the authentication process fails.

The result of the authentication process is notified to the user by an audio signal, as described in *Terminal States* section.

Upon completion of the authentication process (irrespective of the outcome), the terminal automatically reverts to the initial state, wherein it waits for a card detection.

No biometric check, User Identifier in the database

Description

This authentication mode is the version of the "*Biometric check and biometric data in local database*" authentication mode, when biometric check is disabled.

The user's identifier is the only data read on user's card. The terminal checks if the user's identifier exists in the database, but doesn't perform any biometric check. Only if the User ID read from the card exists in the terminal database, user is allowed access.

User's data required in the terminal

The administrator must ensure that the following user data is loaded into the terminal database, at the time of user enrolment.

- the same identifier as the one on the user's card.

If there is no record in the terminal database that corresponds to the User ID, access will be denied to the user in question.

Activation key

- The administrator needs to select Card Type at the time of User Enrolment, such that it can accommodate User ID.
- The administrator needs to correctly configure the **User Record Reference** parameter by using Terminal Menu or Webserver. The value should be such that authentication mode is chosen via 'terminal database'.
- Following parameter is required to be configured:

Parameter Name	Parameter Value	Description
ucc.user_record _reference	0 or 1	If "0", then reference source is based on trigger event *(Default)* If "1", reference is terminal for all trigger sources.

User Interface

The authentication process starts when the user presents his contactless card in front of the terminal (where the antenna of the contactless smartcard reader is located).

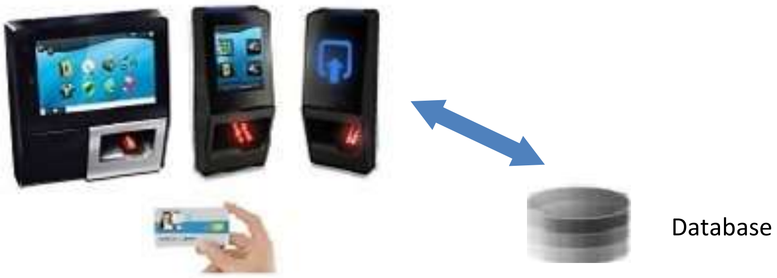


Figure 338: Authentication without biometric control, and with the user login

The User ID is read on the user's card and searched in the local database.

The authentication process succeeds if the User ID is found in the local database. Otherwise, the authentication process fails.

The result of the authentication process is notified to the user by an audio signal as described in "Terminal States" section. Once the authentication process is completed (regardless of the result), the terminal automatically loops back and waits for another user's card presentation.

Authentication process specified by User's card

Description

- When the administrator enables this mode, the conditions for allowing access are specified by a dedicated data on the user's card. This implies that different authentication checks can be performed on the same terminal for different users, based on a 'specific' data present on the user's card. Following are the possible authentication checks

- The biometric check is performed with the reference biometric data found on user's card.

- The PIN check is performed with the reference PIN data found on user's card.

- The PIN + biometric check is performed with the reference PIN + biometric data found on user's card.

- The biometric check is disabled, and only the presence of the User ID on the user's card is checked.

A user's card which disables the biometric control is useful when the biometric data capture is not required in case of a short term visitor, or impossible from physical or legal aspects. Such cards can be encoded without user's presence and the same card can be used for different visitors. The internal database of the terminal is not utilized in such case.

Note: PIN check is applicable to MorphoAccess® SIGMA, SIGMA Lite+, SIGMA Extreme and *MorphoWave®* Compact Series terminals only.

User's data required in the terminal

Since this authentication mode does not use the internal database of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, the administrator need not save any user specific data to the terminal database.

User's data required on the user's card

- The administrator needs to choose a Card Type that can accommodate at least the User ID (user's identifier) as well as the data that determines the 'type' of authentication method to be used. For example, if the administrator sets the PIN + biometric check as ON, the User biometric data of two fingers as well PIN must be encoded onto the user's card.

- If the administrator selects the biometric check as ON, it must be ensured that the biometric data of two fingers of the user, must be encoded onto the user's card.

- If PIN check is required, the user's PIN must be on user's card.
- All other data is ignored.
- The required data must be stored according to TLV format. The user's card format (and the TLV format) is described in the **MorphoAccess® terminals Contactless Card Specification** document.

Activation key

- The administrator can select the Card Type to be 'User ID only' or 'User ID + PIN' or 'User ID or Template' or 'User ID + PIN + Template', based on the requirements. This is decided prior to user enrolment.
- The administrator can set **User Record Reference** parameter as trigger event by using Terminal Menu or Webserver. Please refer to "*User Enrolment in Database" (Step: 37)*.
- If PIN code check and biometric check are not required for the user, then providing a Visitor Card, is the best option. For more details, please refer to "*Encode Visitor Card*"

User Interface

Start

The authentication process starts when the user presents his contactless card at card reader of the terminal.

The terminal looks for the data that describes as to which check is mandatory or disabled, by scanning the user's card. If this data is found, the terminal executes the required process corresponding to the authentication method indicated by this data, which could be with/ without PIN code check, and with/without biometric data check

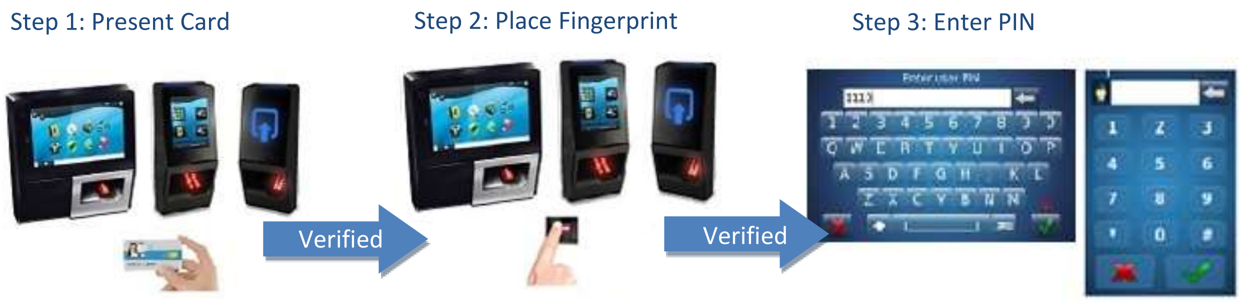


Figure 339: Authentication process specified by user's card

The result of the authentication process is notified to the user by an audio signal as described in "*Terminal States*" section.

Once the authentication process is completed, the terminal automatically loops back and waits for another user's card presentation, irrespective of the outcome of the authentication process (pass/fail).

PIN check disabled, Biometric check mandatory

When the administrator enables this mode, the terminal requires the user to place a finger on the biometric sensor. It executes a comparison of the biometric data of the finger placed on the sensor and the reference biometric data read on user's card.

The process is identical to the one described in "*Biometric check, biometric data on user's card*" section.

PIN check disabled, Biometric check disabled

If the administrator enables this mode, the result of the authentication process is positive (identity confirmed), if the user's identifier is found on the user's card.

The terminal doesn't require the user to place a finger on the biometric sensor, and doesn't perform any biometric check.

The process executed in identical to the one described in "*No biometric check, no User ID check*".

PIN check mandatory, Biometric check mandatory

If the administrator enables this mode, on User ID verification, the terminal requires user to enter a PIN code. The PIN entered by user is matched with the PIN stored on Card.

On successful verification of PIN, the user asked to place a finger on the biometric sensor. Then the biometric data of the finger placed on the sensor and the reference biometric data read on user's card are compared to see if a match exists or not.

The process is identical to the one described in "*PIN verification - PIN stored on card*" section.

PIN check mandatory, Biometric check disabled

If the administrator enables this mode, then on successful User ID verification, the terminal requires user to enter a PIN code. The PIN entered by user is matched with the PIN stored on Card.

The process is identical to the one described in "*PIN verification - PIN stored on card*" section.

Allowed format for User's identifier

TLV structured data

The User ID (user’s identifier) is stored in ASCII characters within a TLV structure.

This is the default configuration of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal: the related parameters are listed in the table below for each type of card:

Parameter Name	Parameter Value	Description
sc_tlv_desfire.aid	0 to 16777215 (0x000000 to 0xFFFFFF) (0x42494F - Default)	Sets DESFire® application ID to read data on TLV card.
sc_tlv_desfire.fid	0 to 31 (0x00 to 0x1F) (0x00 - Default)	Sets DESFire® file ID to read data on TLV card.
sc_tlv_iclass.book_number	0 - 1 (0 - Default)	Sets iCLASS® card book number for 16APP for TLV card.
sc_tlv_iclass.page_layout	1 - 5 (1 - Default)	Sets iCLASS® card page layout for 16APP for TLV card.
sc_tlv_iclass.page_offset	19 - 255 (19 - Default)	Sets iCLASS® card Page offset for 2APP for TLV card.
sc_tlv_mifare.key_policy	1, 2 or 3 (1 - Default)	Sets key policy to read MIFARE® card for TLV mode. Set “1” - Try to read card first with Key A then Key B (Default) Set “2” - Try to read card with Key A Set “3” - Try to read card with Key B
sc_tlv_mifare.num_block	0 - 216 (31 - Default)	Sets number of blocks to read MIFARE® card for TLV mode.
sc_tlv_mifare.start_block	4 - 215 (4 - Default)	Sets start block number to read MIFARE® card for TLV mode.
sc_tlv_iclass.num_block	0 to 255 (128 – Default)	Sets number of blocks to read from iCLASS® card for TLV mode.

The administrator can refer to the document: **MorphoAccess® terminals Contactless Card Specification.** This is a dedicated document that describes the logical structure of the contactless smartcard.

Binary Data

Description

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to use a binary value to read on specific location on user's card, as user's identifier.

As a sample of binary value, the serial number of the card can be used, as explained in the "*Example: MIFARE® card Serial Number*" in this section subsequently.

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to read a binary value which is not aligned on complete bytes. This ability is useful to extract the user's identifier from a Wiegand frame written on the user's card. A sample is described in "*Example: 32 bits user's identifier within a 37-bits Wiegand frame*" section.

No TLV structure is required on user's card: the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to proceed with user's cards written by other systems.

Card type compatibility

This feature can only be used when the "MIFARE® card only" mode is set (User ID in binary or TLV format). Then the related configuration key must be set to zero.

Type of contactless smartcard enabled	
sc.encode_profile = 2	MIFARE® card only (identifier of the user is a binary value).

Configuration keys

The binary data to be read is defined by:

- the first block containing the data,
- the offset of the first byte and first bit of the data, inside the sector. This value must not exceed 15 bytes. The terminal can read data that doesn't start on a full byte,
- the length in bytes and additional data bits; this must not exceed 8 bytes. The terminal can read data where the length is not a multiple of 8 bits,
- the read direction: MSB or LSB.

User Identifier to be read in binary format	
sc_binary_read.data_format = 1	Binary format
sc_tlv_mifare.start_block	[4 - 215] First block to read on card
sc_binary_read.data_length_num_bytes	User ID length in bytes and additional bits limited to 8 bytes (i.e. 8~~.0~~).
sc_binary_read.data_offset_num_bytes	Offset (from the start of the block) of 1st byte and 1st bit of data: 15 bytes maximum (i.e. 15~~.0~~)
sc_binary_read.data_type_direction	Byte read acquisition method: ~~0.~~1 (binary data, MSB first) ~~0.~~0 (binary data, LSB first)

Example: MIFARE® card Serial Number

In this sample the terminal read the first four bytes, in MSB direction, of the first sector of the MIFARE® card which contains the serial number of the card.

If bytes to read are F4 E1 65 34, then the User Identifier value is "4108412212" (ASCII).

Activation of identification mode	
sc_binary_read.data_format = 1	Binary format
sc_binary_read.data_type_direction = 0.1	Binary MSB format
sc_binary_read.data_length_num_bytes = 4~~.0~~	Size = 4 bytes, no additional bit
sc_binary_read.data_offset_num_bytes = 0~~.0~~	First byte of the block
sc_tlv_mifare.start_block = 1	First block of the card

Example: 32 bits user's identifier within a 37-bits Wiegand frame

The user's card contains, at the first block of sector 15 a full 37 bits Wiegand frame (which includes start and stop bits, the site code of the sender, and user's identifier). The first block in sector 15 is block 46.

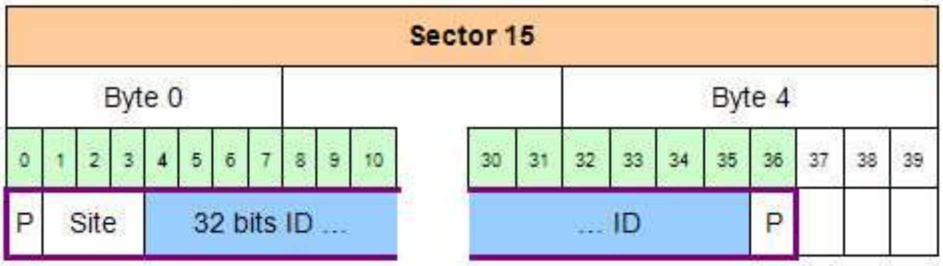


Figure 340: Using a Wiegand frame as User ID

The 32 bits identifier begins at bit four. It is located after the start bit (bit0) and the site code (bit1-2-3), and is followed by the end of frame bit.

Acquisition of a 32 bits user's identifier inside a 37 bits Wiegand frame.	
sc_binary_read.data_format = 1	Binary format
sc_binary_read.data_type_direction = ~~0.~~1	Binary identifier, MSB format
sc_binary_read.data_length_num_bytes = 4~~.0~~	Size = 4 bytes
sc_binary_read.data_offset_num_bytes = ~~0.~~4	User's identifier begins at bit 4 of the first byte of the block specified below
sc_tlv_mifare.start_block = 46	Read from first block of sector 15 (i.e. block 46)

When the user's identifier must be sent to a distant system using Wiegand protocol, it is possible to configure the terminal to automatically add the start and stop bits to the Wiegand output frame.

Section 13 : **Multifactor Access Control Mode**

Multi-factor Mode

Description

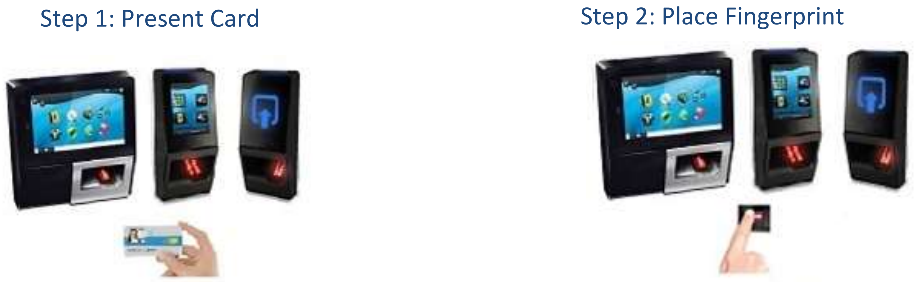
The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal authorizes simultaneous activation of the access control mode by identification and one of the access control modes by authentication.

This is the first user action which automatically selects the access right control process to be executed.

User Interface

In this mode the terminal is waiting for the placement of a finger on the biometric sensor, or for the presentation of a user's card. It will execute the following:

- the identification process if the user places his finger on the biometric sensor first,
- Or the authentication process if the user shows his card first.


Step 1: Present Card

Step 2: Place Fingerprint

Figure 341: Multi-factor mode (identification or authentication)

In case the User database is empty, the identification mode (with finger) is automatically disabled, but the authentication mode is still available (by showing the card).

User's data required in the terminal

The same data as that is required by the "*Identification Mode Description*" and "*Authentication Process*", needs to be configured in the terminal database. Please refer to the corresponding sections.

User's data required on the user's card

The items required on the user's card depend on the activated authentication mode(s). For example, the User's Card needs to have the User ID + User Pin, when PIN verification is mandatory. Please refer to "*Authentication Process*" section for more details.

Activation keys

- The administrator needs to enable the Trigger event through Biometric, Contactless Card, Keypad and External Database.

Section 14 : Tamper Settings for Terminal Security

Tamper Setting for Terminal Security

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal can detect two intrusion attempt types:

- Someone tries to steal the complete terminal,
- Someone tries to open the terminal

Besides Webserver, these configurations are possible via **MorphoBioToolbox** and distant commands also. For more information please refer to "*Anti-Tamper Switch for Terminal Security*" section.

Section 15 : **Wiegand Configurations**

Wiegand Parameters Settings

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals can communicate with distant systems, using Wiegand interface. The protocol used for communicating on Wiegand channel is called Wiegand protocol. It is required to configure Wiegand input and output string format that is understood by terminal and distant system.

Several Wiegand formats are preloaded on MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals and are designated as a Standard type in the table below. They contain an ID of 32 bits or less. All MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals support these formats. Using Webserver, an administrator can configure the desired Wiegand format for both input and output. "Standard 26-bits" is the default format. Besides Webserver, these configurations are possible via distant commands also.

Format	Type	Site Code Range	Template ID Number Range	Extended ID Number Range
Standard 26-bit (default)	Standard	0 - 255	1 - 65535	N/A
Apollo 44-bit	Standard	0 - 16383	1 - 65535	N/A
Northern 34-bit	Standard	0 - 65535	1 - 65535	N/A
Northern 34-bit [no parity]	Standard	0 - 65535	1 - 65535	N/A
HID Corporate [35-bit]	Standard	0 - 4095	1 - 1048575	N/A
Ademco 34-bit (without RCM code)	Standard	0 - 4095	1 - 1048575	N/A
HID 37-bit	Standard	0 - 2047	1 - 16777215	N/A
Auto Detect	Custom	As per the user field (site-code length) defined in the custom slot.	As per the Id length defined in the custom slot.	Configurable (if parameter 'sc.support_l1_cards' is configured to value '2')

Table 3 : Wiegand Format and Associated Values

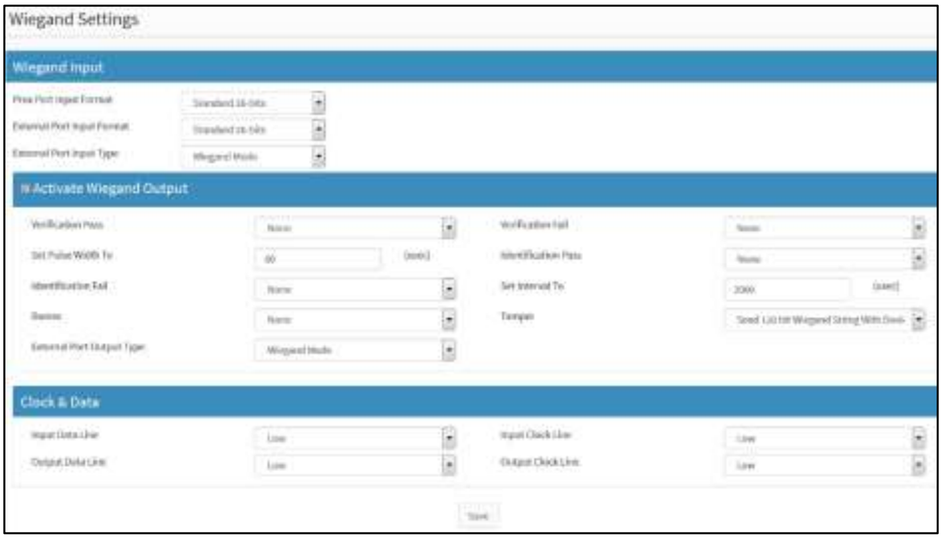
Refer to "*Authentication with local database: ID input from Wiegand or Clock & Data*" to learn more about authentication process when initiated through Wiegand or Clock & Data.

Wiegand Parameters Configuration through Webserver

Access Path

Webserver > Terminal Settings > Wiegand

Screens & Steps



Wiegand Settings

Wiegand Input

Prox Port Input Format: Standard 26-bits

External Port Input Format: Standard 26-bits

External Port Input Type: Wiegand Mode

Activate Wiegand Output

Verification Pass: None

Verification Fail: None

Set Pulse Width To: 60 (usec)

Identification Pass: None

Identification Fail: None

Set Interval To: 2000 (usec)

Duress: None

Tamper: Send 128 bit Wiegand String With Dedi

External Port Output Type: Wiegand Mode

Clock & Data

Input Data Line: Low

Input Clock Line: Low

Output Data Line: Low

Output Clock Line: Low

Figure 342: Wiegand Settings through Webserver

1. Configure below Wiegand Input parameters, for action triggered through Wiegand to terminal:
   a. Select **Prox Port Input Format** from available format list, as mentioned under "*Wiegand Format and Associated Values*"
   b. Select **External Port Input Format** from available format list, as mentioned "*Wiegand Format and Associated Values*"
   c. Select **External Port Input Type** as Wiegand Mode or Clock & Data mode.
      i. If Wiegand mode is selected then Wiegand channel is used for sending input on terminal. By default Wiegand mode is selected
      ii. If Clock & Data mode is selected then Clock & Data channel is used for sending input on terminal. The Clock & Data settings will be applicable if this mode is activated.

Auto-Detect can be configured for **Prox Port input format/HID Card Number Format** and **External Port Input Format**. Please refer to **MA SIGMA - Application note - Wiegand formats** for more information. Kindly follow the notes for Auto-Detect.

1. It is mandatory to configure at least one Wiegand custom slot.

2. If there are multiple formats defined in the custom slots having same length, then first matching slot will be considered.

2. **Activate Wiegand Output**: This parameter is enabled to allow the Wigand data to be sent using Wiegand Output Port. If this parameter is disabled then the terminal never tries to send any data frame through Wiegand port. Configure the Wiegand Output parameters listed below, for each event which must be communicate through Wiegand from the terminal:
    a. Select **Verification Pass** format from available format list, as mentioned under "*Wiegand Format and Associated Values*"
    b. Select **Verification Fail** format from available format list, as mentioned under "*Wiegand Format and Associated Values"*
    c. Select **Identification Pass** format from available format list, as mentioned under "*Wiegand Format and Associated Values"*
    d. Select **Identification Fail** format from available format list, as mentioned under "*Wiegand Format and Associated Values"*
    e. Select **Duress Finger** detection format as 'None' or 'Reverse Wiegand Output'. When duress finger is detected and verification is successful, terminal will send Wiegand output in selected form, to access controller. A controller will further respond by opening door
    f. Select **Tamper** detection format as 'None' or 'Send 130 bit Wiegand String With Device Serial Number'. It is a pre-requisite to enable Tamper settings in the terminal. When tamper event is detected, terminal will send terminal serial number in a Wiegand string format to access controller, for alerting controller about the Tamper detection.
    g. Select **External Port Output Type** as 'Wiegand Mode' or 'Clock & Data mode'. If you select Clock & Data mode, then respective format will be used for sending data over Wiegand port.
    h. **Set Pulse Width To** in terms of microseconds
    i. **Set (Pulse) Interval To** in terms of microseconds

Wiegand Propagation

The last received input Wiegand frame format can be applied on the output Wiegand format, as defined in "*Complete control configuration*". This can be activated by applying the value, "**Wiegand Last Format Input**" to "**Wiegand event Verification fail**" or "**Wiegand event Verification pass**" configuration. Please refer to Wiegand

Propagation section in **MA SIGMA - Application note - Wiegand formats,** for more information. Kindly follow the notes mentioned below :

1. It is mandatory to define custom format slot 0 to enable "***Wiegand Last Format Input***".
2. If trigger source for authentication is keyboard or distant command, the Wiegand last format output will considered as per custom slot_0.

3. If External Port Input Type and Output Type is selected as Clock & Data, then configure Clock & Data parameters:
   a. Select **Input Data Line** as Low or High
   b. Select **Output Data Line** as Low or High
   c. Select **Input Clock Line** as Low or High
   d. Select **Output Clock Line** as Low or High
4. Click on **Save**

Section 16 : **Threat Level Configurations**

Threat Level Configuration

This feature allows an administrator to set threat levels using the TTL input lines. When enabled, the TTL signals can define the level of security and also can be used to compel users to use a specific authentication method. The available choices are Card Only and Card + Biometrics. For example, if Threat level 1 is set to Card + Biometrics and the TTL input for GPI0 is triggered, a successful verification requires presenting a smart card and a finger to the terminal.

If TTL is not active (both lines are 0), the verification follows command based inputs.

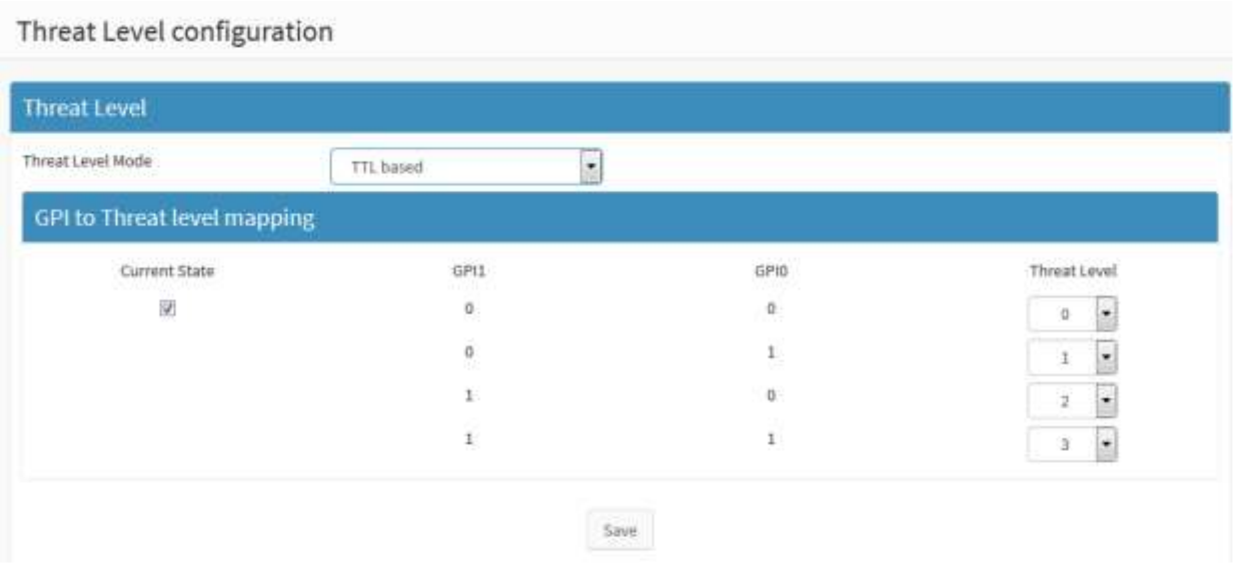
Besides Webserver, these configurations are possible via **MorphoBioToolbox** and distant commands also.

Threat Level Configuration through Webserver

Access Path

Webserver > Terminal Settings > Threat Level

Screens & Steps



Threat Level configuration

Threat Level

Threat Level Mode: TTL based

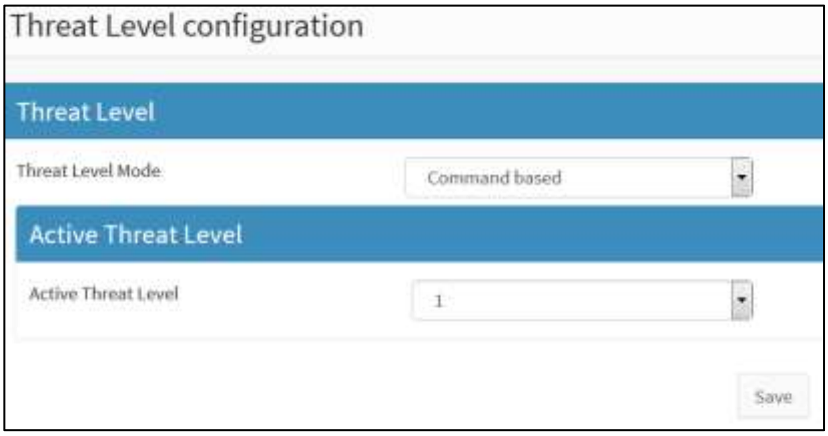
GPI to Threat level mapping

Current State	GPI1	GPI0	Threat Level
☑	0	0	0
	0	1	1
	1	0	2
	1	1	3

Figure 343: Configuring TTL Based Threat Level

1. Select **Threat Level Mode** as “TTL based”. In this mode, Active Threat Level will be determined by the current TTL line status and its mapping as per GPI to Threat Level Mapping. For example, to activate Threat Level 2, GPI1 line should be triggered. GPI to Threat Level Mapping allows an administrator to configure active threat level as per the GPI line.
2. User can change the default settings of GPI to Threat Level Mapping. Select the threat level corresponding to GPI line 1 and GPI line 0

3. Click on **Save**


Threat Level configuration

Threat Level

Threat Level Mode: Command based

Active Threat Level

Active Threat Level: 1

Figure 344: Configuring Command Based Threat Level

4. Select Threat Level Mode as ‘Command based’. If Threat Level is set to Command Based, the active threat level from the drop-down box has to be set. With Command Based threat level, the terminal does not refer to TTL lines inputs.
5. Command based threat level can also be modified using threat level parameters under Webserver > Complete Configuration and also distant commands.
6. Select **Active Threat Level** from dropdown menu
7. Click on Save

Section 17 : **Time and Attendance Configurations**

Time and Attendance Synoptic

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals can be configured to work in Time and Attendance (T&A) mode. When T&A mode is enabled, each terminal event logged would have some attendance information (such as entry time, exit time, etc.).

When the time and attendance feature is activated, the home screen of the terminal displays certain function keys or a bitmap file.

Along with biometric presentation, user is also required to select applicable function key (F Key). Suppose, user is entering office in the morning, then F key displaying 'IN' must be pressed. Similarly on every exit and entry the appropriate option must be selected.

T&A action inputs are logged by the terminal. This information is used to track the attendance of an employee, analyze employee productivity and overall organization productivity. Thus Time and Attendance mode becomes a crucial feature for human resource management.

T&A Modes and Function Keys	SIGMA and SIGMA Extreme Series, MorphoWave ® Compact	SIGMA Lite Series	SIGMA Lite+ Series
Two Function Key Mode	✗	✗	✓
Normal Mode (4 Function Keys: IN, OUT, IN DUTY(LUNCH IN), OUT DUTY(LUNCH OUT)	✓	✗	✗
Extended Mode (16 Function keys)	✓	✗	✗
T&A Mandatory Mode Selection	✓	✗	✓

Parameter Configuration

Time and Attendance Mode Activation	
time_and_attendance.tna_mode	If an administrator selects 0, the T&A mode is disabled. If an administrator selects 1, the T&A mode is enabled. When T&A is enabled, it will show 2 F-keys for MorphoAccess® SIGMA Lite+ Series and 4 F-keys for MorphoAccess® SIGMA and SIGMA Extreme Series (if 'Normal Mode' is activated).

Time and Attendance Mandatory/Normal Mode Selection	
time_and_attendance.tna_mandatory_mode	If an administrator selects 0, the mandatory mode is disabled. If an administrator selects 1, the mandatory mode is enabled.

Besides Webserver, these configurations are possible via **MorphoBioToolbox** and distant commands also.

T&A Mode in MorphoAccess® SIGMA Lite+ Series

There are 2 function keys that can be associated with T&A action and displayed to the user. When T&A data is required from the user, the terminal displays the Time and Attendance screen below:

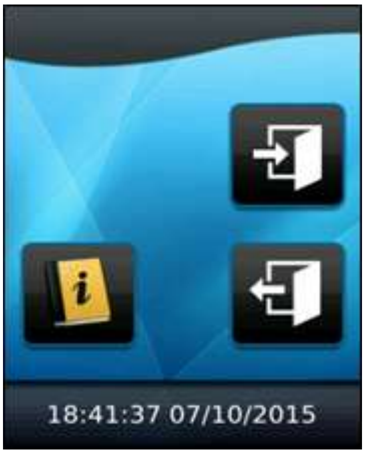


Figure 345: Two Function Key Mode for MALite

In the above sample screen, the IN function is associated to"⇥" key, OUT function is associated to "⇤" key. A user can select any of the Function Keys to input required T&A action

T&A Mode in MorphoAccess® SIGMA/SIGMA Extreme Series Normal Mode & MorphoWave® Compact

In normal mode, there are 4 function keys that can be associated with T&A action and displayed to the user. When T&A data is required from the user, the terminal displays the Time and Attendance screen below:

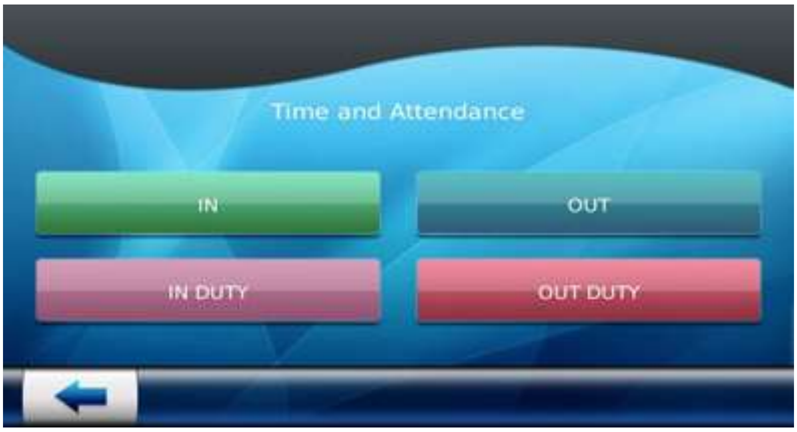


Figure 346: Time and Attendance Screen in Normal Mode

In the above sample screen, the IN function is associated to F1 key, OUT function is associated to F2 key, IN Duty is to F3 and OUT Duty is to F4. A user can select any of the Function Key to input required T&A action. Instead of texts, icons can be selected to be displayed to the user.

Parameter Configuration

Time and Attendance Text/Icon Mode Selection	
time_and_attendance.message_text_mode	Parameter to choose whether 4 actions mode uses texts or icons. In text mode, text displayed on LCD can be customized. In icon mode, the pre-set icons/images are displayed for function keys 0 - 4 actions in texts (0 - Default) 1 - 4 actions in icons

Extended Mode

In extended mode, there are 16 function keys that can be configured and displayed to the user. When T&A data is required from the user, the terminal displays the Time and Attendance screen below:

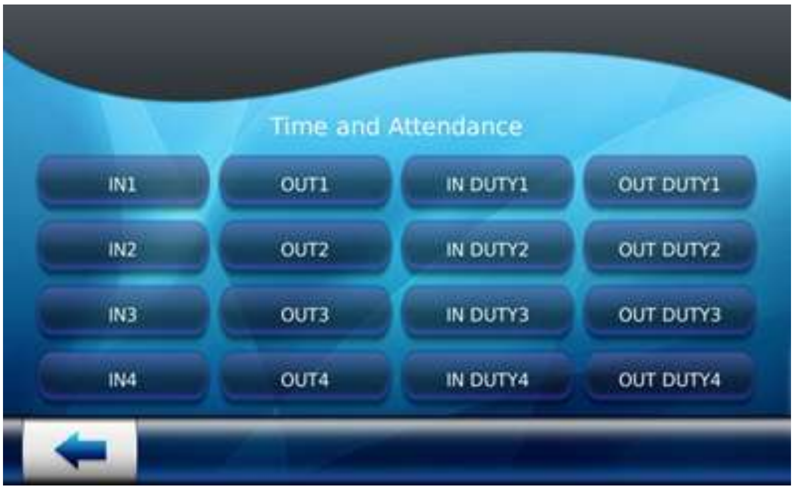


Figure 347: Time and Attendance Screen in Extended Mode 1x16

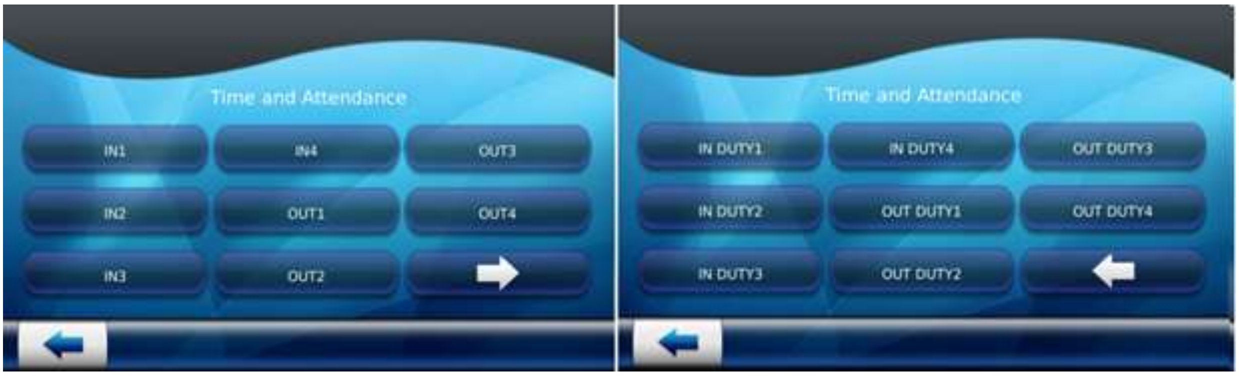


Figure 348: Time and Attendance Screen in Extended Mode 2x8

In the above sample screen,

- IN1 function is associated to F1 key,
- OUT1 function is associated to F2 key,
- IN Duty1 is to associated to F3,
- OUT Duty1 is to associated to F4,
- In case of 2x8, click on "➡" key to go to the second screen.
- ... Up to 16 function keys.

A user can select any of the Function Key to input required T&A action.

The selected function is written in the access request record, stored in the log file, and included in the "User Identifier" message sent to a distant system.

After selection, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal switches in biometric mode (identification or authentication).

The selected function is written in the log file and sent to the host. For extended time attendance, the code of the pressed key is logged (i.e. 0x31 for key 1, 0x32 for key 2 …).

If the user has selected the wrong operation (IN/OUT...), back button “⬅” can be used at any moment during wait for a finger or a card, to abort the verification. In this case, nothing is logged or sent to the controller.

After 20 seconds of inactivity on identification mode (no finger detected on the sensor), the terminal switches back to the selection screen. In this case the operation result is logged and/or sent to the controller (result = timeout).

Parameter Configuration

Time and Attendance Extended Mode Selection	
time_and_attendance.tna_extended_mode	When Time & Attendance extended mode is enabled, there are 16 function keys that are configurable and displayed to user to select from. If an administrator selects 0, the extended mode is disabled. If disabled, then T&A will be by default on normal mode where only 4 F keys are displayed. If an administrator selects 1 (1x16 on 1 screeen) or 2 (2x8 on 2 screens), the extended mode is enabled.

T&A Mode Mandatory or Optional Scenarios

- **Mandatory:** An administrator can set T&A Mode as Mandatory. It means it is mandatory for the user to input T&A action by selecting function key, in order to get access. There are three possible scenarios when T&A is in normal mandatory mode and user initiates an access request.

- **T&A before User Control by selecting F Key:** It means user first selects a T&A action, then terminal will ask user to place his finger on the sensor or present his card. Then, after user's data acquisition, the terminal checks access rights and display the result for the user.

- **T&A before User Control without selecting F Key:** In this scenario, user will place his finger on the sensor or present his card. Instead of access rights check, terminal will first prompt user to enter a T&A action. Once function key is selected, user access rights check will begin and terminal will display access result.

- **T&A after User Control without selecting F Key:** In this scenario, user will place his finger on the sensor or present his card. Terminal will first authenticate the user. On access granted result, terminal will prompt user to enter a T&A action. Once function key selected, terminal will allow access.

- **Optional:** If T&A Mode is not mandatory, then user has a choice to whether input the function key or not. The terminal will initiate access rights check without T&A input. However, the transaction logs generated has the records which states that user has input the F key.

Results

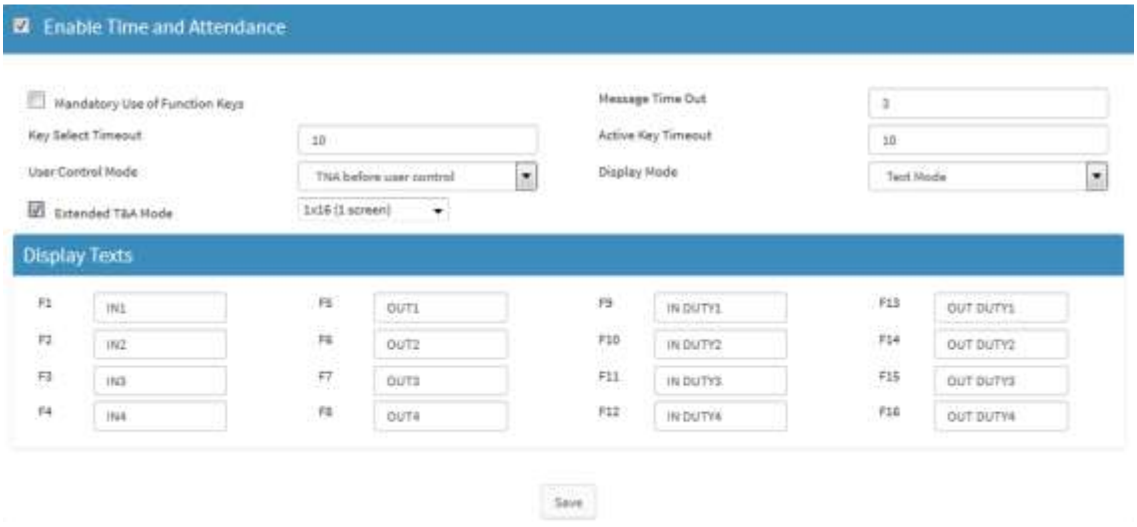
Once T&A parameters are configured, T&A icon is displayed on the home screen of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal. When user presents his fingerprint, on successful authentication, terminal will ask user to select functional key on T&A screen. If T&A is not mandatory, user can select the T&A icon before presenting the fingerprints, if required.

Time and Attendance configuration through Webserver

Access Path

Webserver > Terminal Settings > Time and Attendance

Screens & Steps



☑ Enable Time and Attendance

☐ Mandatory Use of Function Keys

Key Select Timeout: 10

User Control Mode: TNA before user control

☑ Extended T&A Mode: 1x16 (1 screen)

Message Time Out: 3

Active Key Timeout: 10

Display Mode: Text Mode

Display Texts

F1	IN1	F5	OUT1	F9	IN DUTY1	F13	OUT DUTY1
F2	IN2	F6	OUT2	F10	IN DUTY2	F14	OUT DUTY2
F3	IN3	F7	OUT3	F11	IN DUTY3	F15	OUT DUTY3
F4	IN4	F8	OUT4	F12	IN DUTY4	F16	OUT DUTY4

Figure 349: Normal Time and Attendance mode

1. Click on **Enable Time and Attendance**, for enabling this mode

Click on **Mandatory Use of Function Keys**. On enabling this, terminal will pop up T&A screen every time after user presents fingerprint. If mandatory is not selected, then user can select T&A option before

Message Timeout: an administrator can define the duration for which access result is displayed on the LCD screen of the terminal

Key Select Timeout: an administrator can define a duration for which F key selection option will be displayed. If user does not input the key, then access is denied (in case T&A is mandatory). Valid range of timeout is 1 to 60 seconds.

Active Key Timeout: within this duration the key should be pressed, if operation failed first time. Valid range of timeout is 1 to 60 seconds.

Select **User Control Mode** as "TNA before user control", it means user have to first select a T&A action before user control; or "TNA after user control", it means user have to select TNA action after user control (such as entering biometric/pin data).

Select **Displayed Mode** as "Text mode" or "Icon Mode". By default text is selected. If an administrator select "Icon mode", than instead of F key with text, icons are displayed, refer "*Time and Attendance UI in Normal mode with Icon*".

> **NOTE:** Icon mode display is not applicable for T&A extended mode. Text mode is not available for *MorphoAccess® SIGMA Lite+ Series*.

If an administrator requires T&A in Normal mode, then do not select Extended T&A mode check box. In normal mode, only 2/4 functional keys are required to be configured

Enter **Display Text**. In this section an administrator can customize the text associated with the Functional Keys. The text length should be 1 to 20 characters only. By default below text is displayed, which is editable (applicable to MorphoAccess® SIGMA and SIGMA Extreme Series):

a. F1 = IN

b. F2 = OUT

c. F3 = IN DUTY

d. F4 = OUT DUTY

Click on **Extended T&A Mode** checkbox. Under extended mode 16 functional keys can be configured

Enter **Display Text**. In this section an administrator can customize the text associated with the Functional Keys. The text length should be 1 to 20 characters only.

Click on **Save** once required configurations done.

T&A - Mandatory Mode Work Flow Diagram

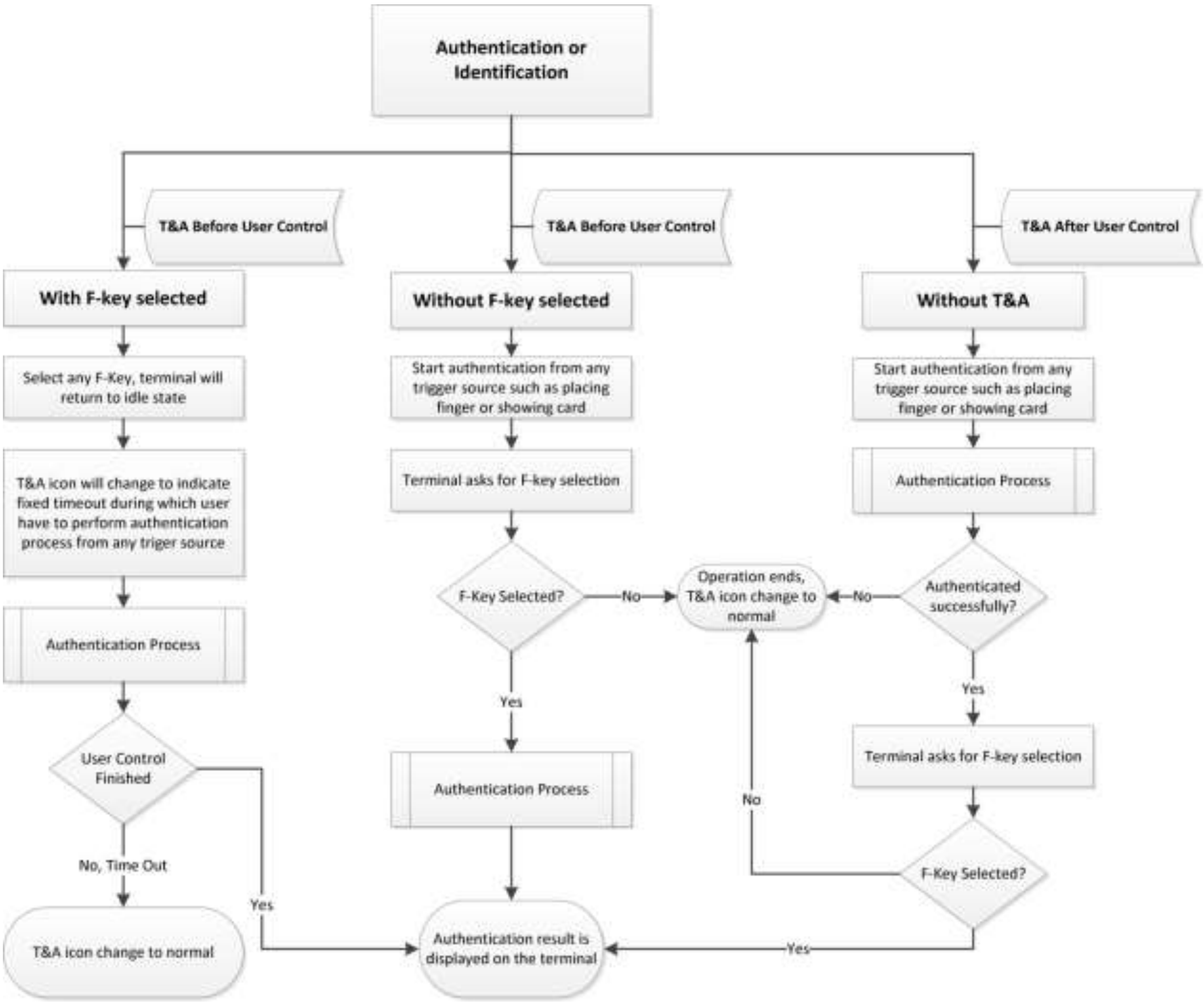

Authentication or Identification
T&A Before User Control
T&A Before User Control
T&A After User Control
With F-key selected
Without F-key selected
Without T&A
Select any F-Key, terminal will return to idle state
Start authentication from any trigger source such as placing finger or showing card
Start authentication from any trigger source such as placing finger or showing card
T&A icon will change to indicate fixed timeout during which user have to perform authentication process from any triger source
Terminal asks for F-key selection
Authentication Process
F-Key Selected?
No
Operation ends, T&A icon change to normal
No
Authenticated successfully?
Authentication Process
Yes
Yes
User Control Finished
Authentication Process
Terminal asks for F-key selection
No
No, Time Out
F-Key Selected?
Yes
T&A icon change to normal
Authentication result is displayed on the terminal
Yes

Figure 350: Time and Attendance in Mandatory Mode Workflow Diagram

T&A - Non Mandatory Mode Work Flow Diagram

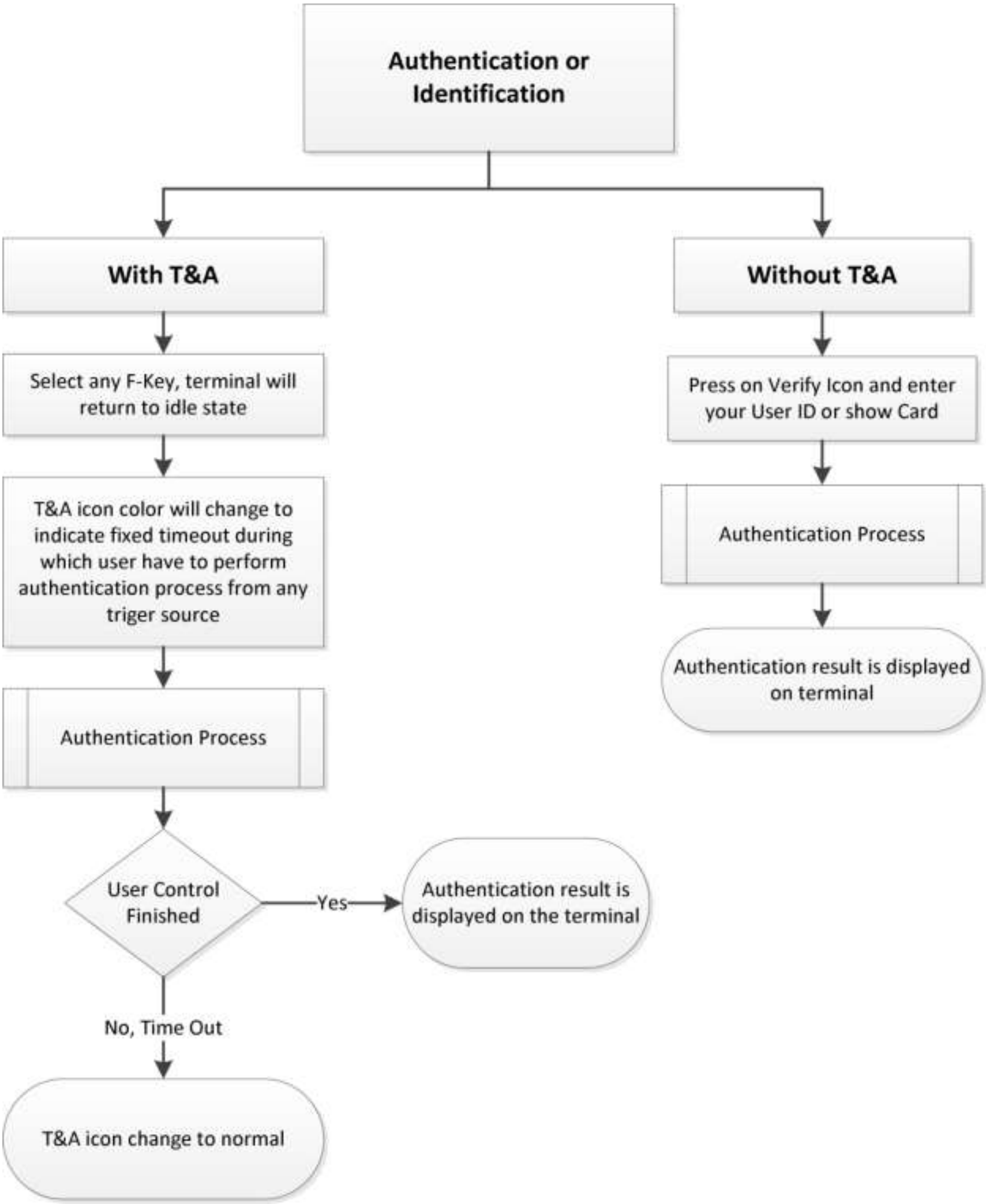

Authentication or Identification
With T&A
Without T&A
Select any F-Key, terminal will return to idle state
T&A icon color will change to indicate fixed timeout during which user have to perform authentication process from any triger source
Authentication Process
User Control Finished
Yes
Authentication result is displayed on the terminal
No, Time Out
T&A icon change to normal
Press on Verify Icon and enter your User ID or show Card
Authentication Process
Authentication result is displayed on terminal

Figure 351: Time and Attendance in Non-Mandatory Mode Workflow Diagram

Section 18 : **Schedules configuration**

Schedules Configuration

Define Access Schedule

Access Schedules is used to define a time slot, during which access is allowed, for example during working hours of working days. Before and after the selected timings, the access is denied to the user even if the authentication is successfully.

Access schedule enables to define time slots for entire week. A time slot is defined by selecting one or several successive quarter hours (For 1 day, the maximal number of quarter-hour is 96. It means a full day).

64 access schedules are manage by terminal

- By default, Schedule no. 0 is defined as access denied at whichever time the access is requested
- By default, Schedule no. 63 is defined as FULL access time slot. On user enrolment, Access Schedule 63 is assigned by default.
- Schedule no. 62 is defined as “User Access Schedule”, if this schedule number is selected for a user then user specific schedule is refered.
- Schedule no. 59 to Schedule no. 62 are reserved for internal use and cannot be assigned to any user.
- Schedule no. 1 to no. 58 are configurable

On user enrolment, administrator can select the required access schedule and associate it with the user details. E.g. Access Schedule 1 is created and has access rights in time slot from 8:00 am 13:00 pm and then from 14:00 pm to 20:00 pm (with interval being from 13:00 pm to 14:00 pm). User is granted access only from 8:00 to 13:00 and from 14:00 to 20:00.

Every time on successful authentication of the user, the terminal will also check access schedule selected for the user and will allow access according to the defined schedule.

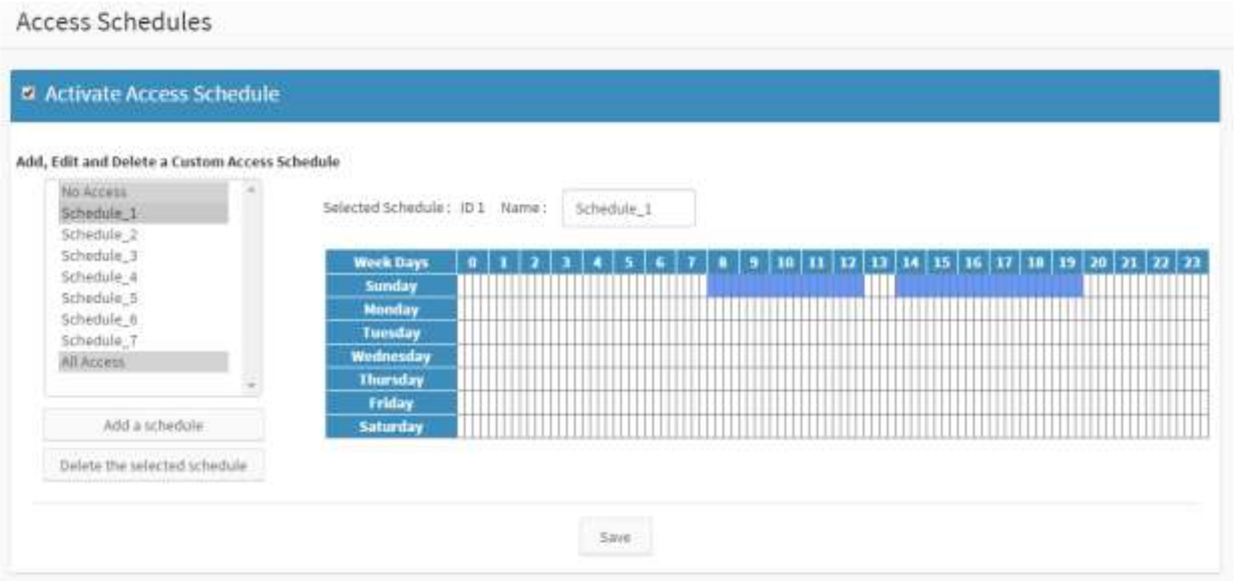
Using Webserver, an administrator can configure Access Schedule, for MorphoAccess® SIGMA Family terminals. Besides Webserver, these configurations are possible via distant commands also.

Add/Edit/Delete an Access Schedule through Webserver

Access Path

Webserver > Schedules > Access Schedules

Screens & Steps



Access Schedules

☑ Activate Access Schedule

Add, Edit and Delete a Custom Access Schedule

- No Access
- Schedule_1
- Schedule_2
- Schedule_3
- Schedule_4
- Schedule_5
- Schedule_6
- Schedule_7
- All Access

Add a schedule

Delete the selected schedule

Selected Schedule : ID 1 Name : Schedule_1

Week Days	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sunday									🟦	🟦	🟦	🟦	🟦		🟦	🟦	🟦	🟦	🟦	🟦				
Monday																								
Tuesday																								
Wednesday																								
Thursday																								
Friday																								
Saturday																								

Save

Figure 352: Adding Access Schedule

1. The list of default access schedules is displayed as “No Access” and “All Access”. Default access schedules are available by default and not editable. An administrator can add new schedules as per requirement
2. Click on **Add a Schedule** to create a new access schedule
3. Enter Name of the schedule
4. Define Time Slots. Select the appropriate block according to start & stop time for each day, by single click on individual block or by selecting multiple blocks inside the table area. The selected area will be seen in different color and it will define the time slot during which the access will be granted to user.
5. Repeat above step 2, step 3 and step 4 to add more schedules.
6. Click on **Save** to save all previously defined access schedules in the terminal.
7. An administrator can edit Access Schedule Name and Time Slots. To edit the access schedule, select an access schedule from the list and follow the above steps 3 to 6.
8. The Administrator can delete one or several access schedules.

9. To delete an access schedule, select an access schedule from the list and click on the **Delete** the Selected Schedule. Repeat these operations for each access schedule to delete. Finally click on Save to save all deleted access schedules in the terminal.

NOTE: *The default access schedules cannot be modified.*

Add/Edit/Delete an Access Schedule through distant commands

Refer to 2017_2000024584 - MorphoAccess SIGMA Family - Distant Commands Guide

Results

An Access Schedule is created from 08:00 am to 13:00 pm and 14:00 pm to 20:00 pm and it is available for assignment to users at the time of user enrolment. User is allowed to access only during the scheduled access time. If user tries to access at another time, then MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal will deny access to the user.

Define User Access Schedule

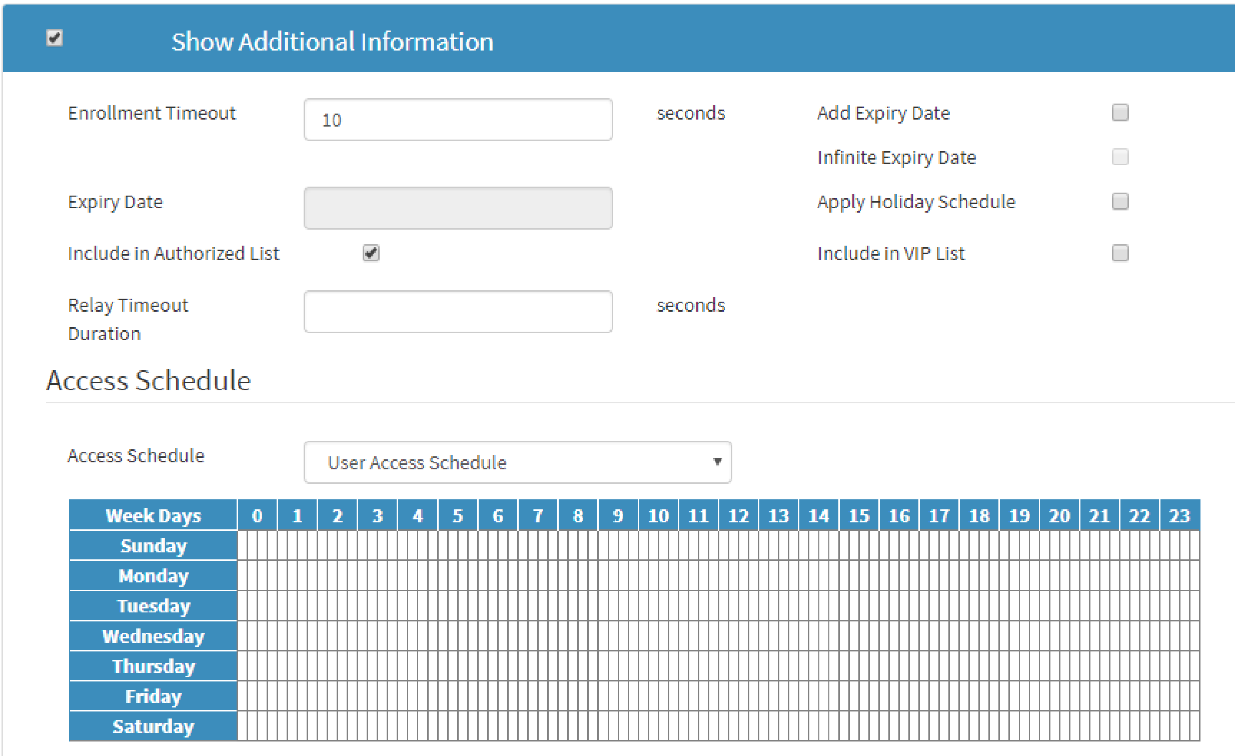
User Access Schedule is similar to Access Schedule but these are defined on user level and are stored in the user records. Terminal refer to user access schedule when the schedule number is set to 62. If the user access schedule is not defined in user database, by default “All Access” is given to user.

User Access schedule defined as time slots for entire week. A time slot is defined by selecting one or several successive quarter hours (For 1 day, the maximal number of quarter-hour is 96. It means a full day).

User access schedule can be created while user enrollment via. webserver or distant command. If user access schedule is selected while user enrollment via. GUI then by default “All Access” is set as user access schedule for that user.

Add a User Access Schedule through Webserver while user enrollment

Screens & Steps



☑ Show Additional Information

Enrollment Timeout: 10 seconds

Add Expiry Date □

Infinite Expiry Date □

Expiry Date

Apply Holiday Schedule □

Include in Authorized List ☑

Include in VIP List □

Relay Timeout Duration: seconds

Access Schedule

Access Schedule: User Access Schedule ▾

Week Days	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Sunday																								
Monday																								
Tuesday																								
Wednesday																								
Thursday																								
Friday																								
Saturday																								

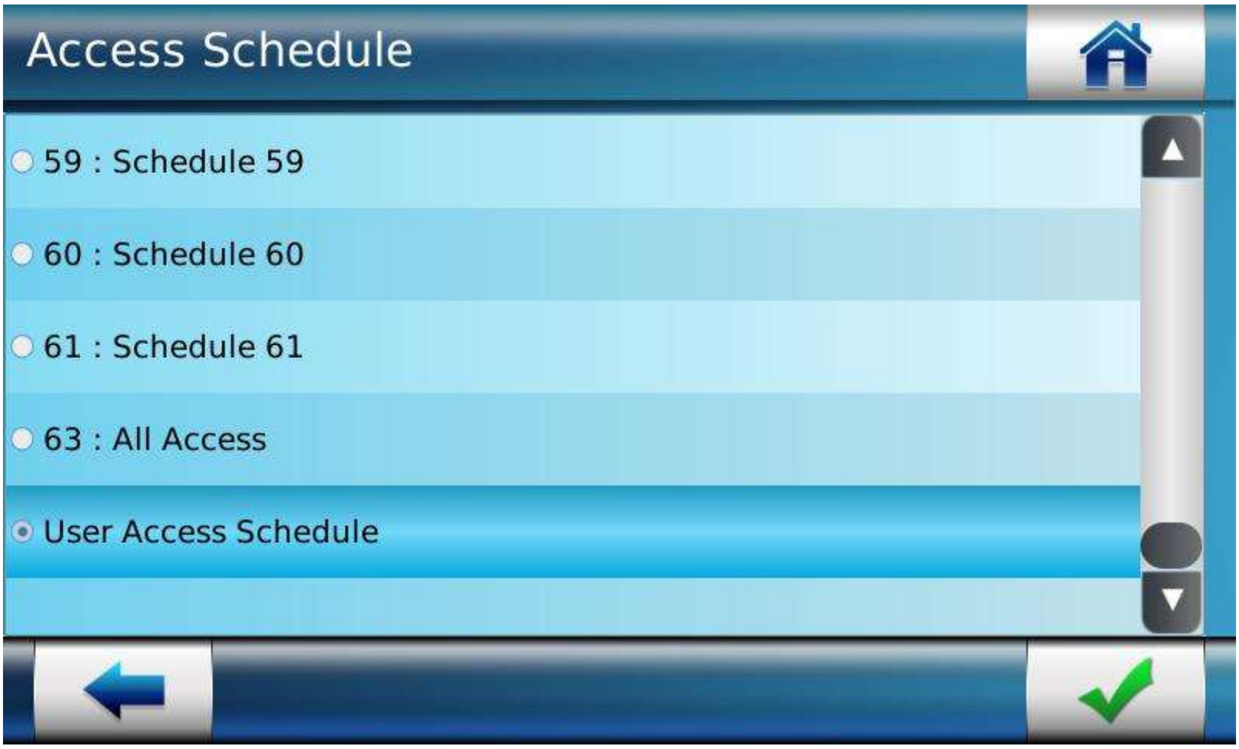
Figure 353: User Access Schedule through Web Server

1. Enroll a new user through Web Server and while enrollement select “Show Additional Information”.
2. Under Access Schedule section select “User Access Schedule” from the drop-down menu.

3. Define Time Slots. Select the appropriate block according to start & stop time for each day, by single click on individual block or by selecting multiple blocks inside the table area. The selected area will be seen in different color and it will define the time slot during which the access will be granted to user.
4. Click on “Enroll User” button to enroll the user.

Add a User Access Schedule through GUI while user enrollment

Screens & Steps



Access Schedule

○ 59 : Schedule 59

○ 60 : Schedule 60

○ 61 : Schedule 61

○ 63 : All Access

● User Access Schedule

Figure 354: User Access Schedule through GUI

1. Enroll a new user through terminal GUI and select Access Schedule from the menu.
2. Select “User Access Schedule” as access schedule for the user and click on OK button to enroll the user.
3. The user is enrolled with user access schedule and user access schedule set as “All Access”(default value).

Define Holiday Schedule

Using holiday schedule, an administrator can control access of users on holidays. Holiday Schedule can be defined for the public holidays of entire Year. When user tries to access, terminal will authenticate user and on successful authentication, terminal will check if Holiday Schedule is to be considered. Even if the user is authenticated, the access is denied on the holiday, if the user observes holiday.

Besides Webserver, these configurations are possible via **MorphoBioToolbox** and distant commands also.

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal can support up to 46 holiday schedules.

Add a Holiday Schedule through Webserver

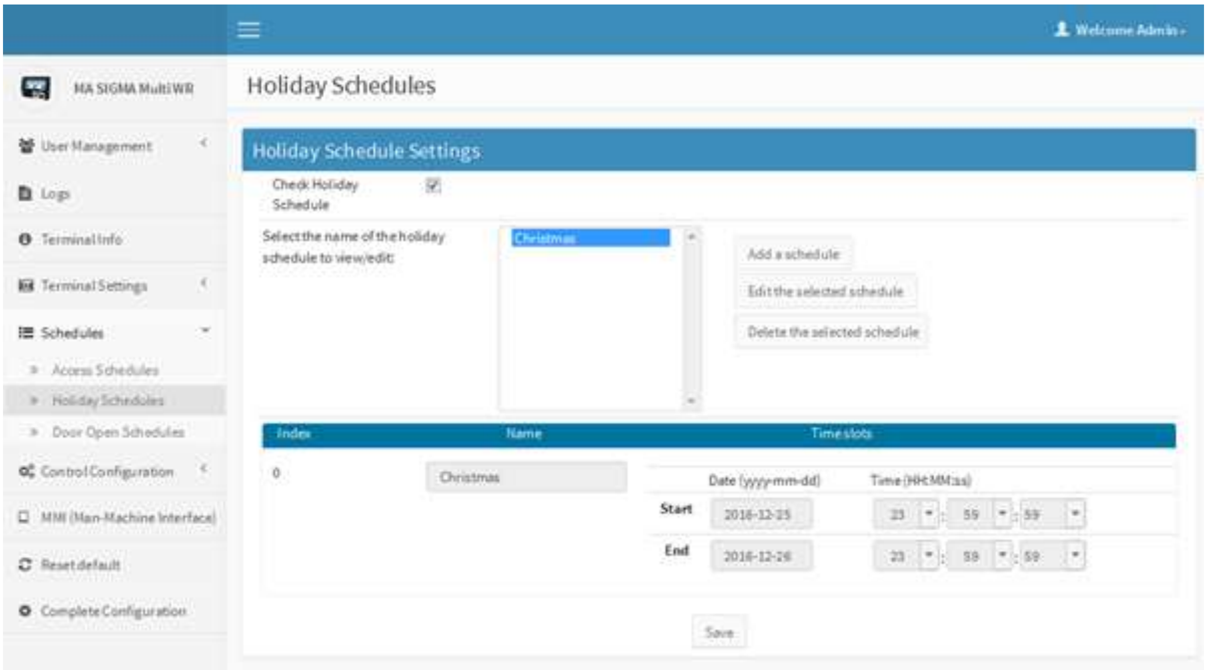
Access Path

Webserver > Schedules > Holiday Schedules

Pre-requisites

- Observe Holiday parameter should be enabled for individual user, at the time of User Enrolment

Screens & Steps



Holiday Schedules

Holiday Schedule Settings

Check Holiday Schedule ☑

Select the name of the holiday schedule to view/edit: Christmas

Index	Name	Timeslots		
			Date (yyyy-mm-dd)	Time (HH:MM:ss)
0	Christmas	Start	2016-12-25	23 : 59 : 59
		End	2016-12-26	23 : 59 : 59

Figure 355: Creating a Holiday Schedule

1. Enter **Schedule Name**, usually the name of the holiday (such as "Christmas")
2. Select **Start Date** and **End Date** of the holiday, by default the date format is YYYY-MM-DD. One schedule allows to specify several consecutive days
3. Select **Start Time** and **End Time**, applicable on selected dates. By default the date format is HH:MM:ss. During this time slab, access is not granted.
4. Click on **Apply**

Results

A Holiday Schedule is created. An administrator can define holidays of entire year (one holiday schedule per holiday). When Observe Holiday parameter is enabled in user template, then during the defined holidays user is not allowed access. Terminal will deny access to the user.

Door Open Schedule Configuration

The **Door Open Schedule** option allows terminal to keep the Door Unlocked for a specific period of time. Using Webserver interface, the Door Open Schedule can be defined. During this period, access is granted without any access rights check. That is users can access without biometric authentication.

In a real life scenario, this feature can be implemented during lunch hours, when all employees need to go out or come in for a lunch break. Hence the door open schedule can be configured if no biometric check is required during specific interval.

Besides Webserver, these configurations are possible via **MorphoBioToolbox** and distant commands also.

Door Open Schedule Configuration through Webserver

Access Path

Webserver > Schedules > Door Open Schedules

Pre-requisites

- SDAC must be activated

Screens & Steps

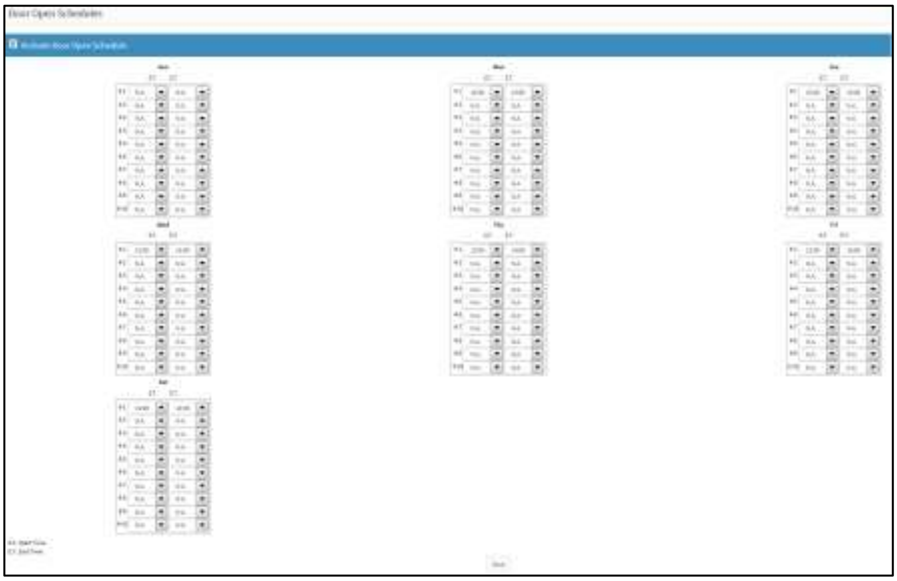


Figure 356: Door Open Schedule Configuration

1. Set **Start Time** and **End Time** for each day of the week
2. Click on **Save**

Results

As per the Door Open Schedule, terminal will send signal to door control panel to open the door at a start time of the schedule. The door is opened (or unlocked) till the end time of the schedule. On end time terminal will send signal to door panel to close (or lock) the door.

Section 19 : **Controller Feedback**

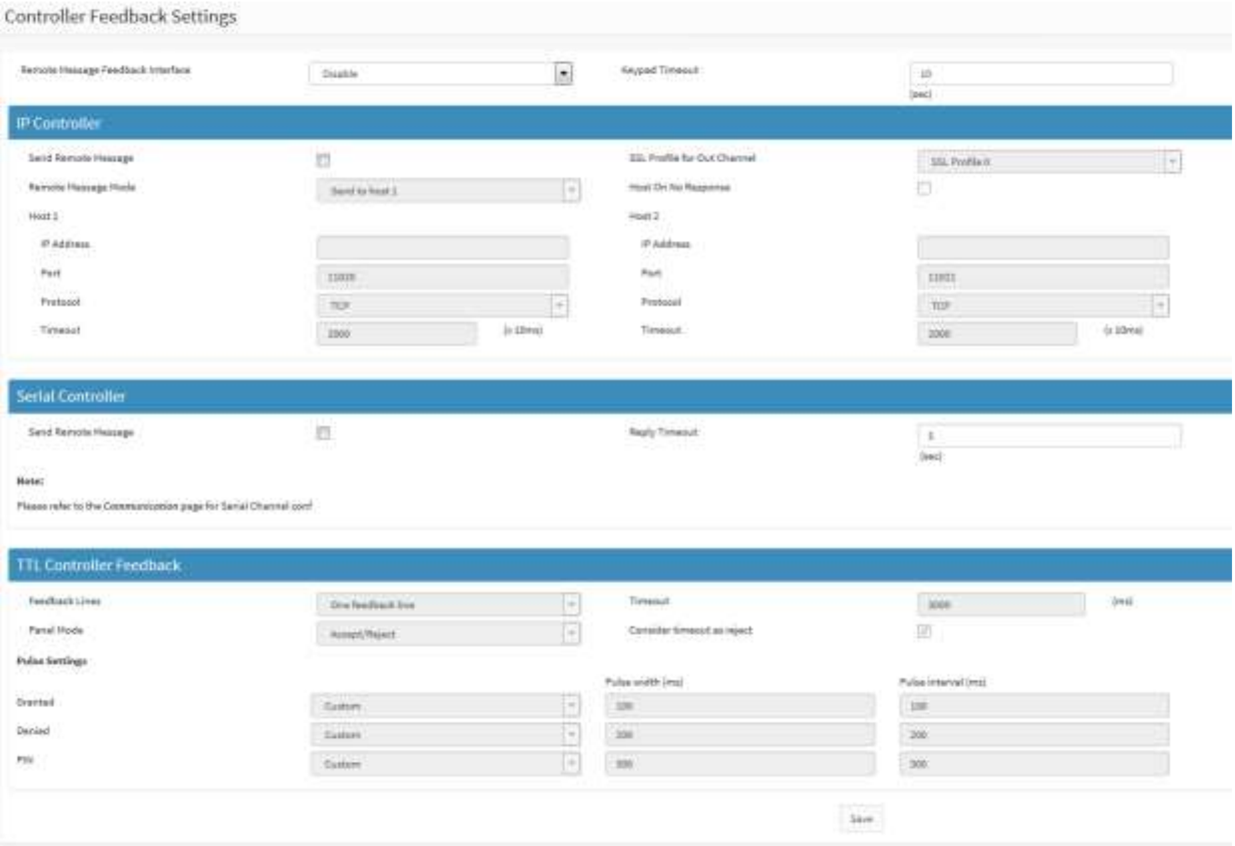
Controller Feedback

The administrator can configure parameters that enable the Access Controller to send feedback messages on every event reported by the terminal. Besides Webserver, these configurations are possible via distant commands also.

Access Path

Webserver > Control Configuration > Controller Feedback

Screens & Steps



Controller Feedback Settings

Remote Message Feedback Interface: Disable
Keypad Timeout: 10 (sec)

IP Controller

Send Remote Message: □
SSL Profile for Out Channel: SSL Profile 0
Remote Message Mode: Send to host 1
Host On No Response: □

Host 1
IP Address:
Port: 11020
Protocol: TCP
Timeout: 2000 (x 10ms)

Host 2
IP Address:
Port: 11021
Protocol: TCP
Timeout: 2000 (x 10ms)

Serial Controller

Send Remote Message: □
Reply Timeout: 1 (sec)

Note:
Please refer to the Communication page for Serial Channel conf

TTL Controller Feedback

Feedback Lines: One feedback line
Timeout: 3000 (ms)
Panel Mode: Accept/Reject
Consider timeout as reject: ☑

Pulse Settings

		Pulse width (ms)	Pulse interval (ms)
Granted	Custom	100	100
Denied	Custom	200	200
PIN	Custom	300	300

Figure 357: Controller Feedback Settings from Webserver

1. Select Remote Message Feedback Interface as:
    a. **Disable:** If an administrator do not require to expect Controller Feedback, then an administrator can set interface as Disabled
    b. **Feedback over IP:** Select Feedback over IP, if controller feedback is to be received on IP channel
    c. **Feedback over Serial:** Select Feedback over Serial, if controller feedback is to be received on Serial channel (Applicable only to MorphoAccess® SIGMA and SIGMA Extreme Series terminals)

   d. **Feedback over TTL:** Select Feedback over TTL, if controller feedback is to be received on Wiegand String. The following parameters need to be configured, only if Wiegand channel is used.

2. Select **Feedback Lines**, it means the number of lines in which access controller will send feedback to terminal. An administrator can select "One feedback line" or "Two feedback line"
3. Select **Panel Mode** as
   a. **Accept/Reject:** This mode indicates that access controller will only send Accepted (Access Granted) or Rejected (Access Denied) feedback messages to terminal
   b. **Accept/Reject/PIN:** Access Controller feedback consists of Accepted (Access Granted), Rejected (Access Denied) and PIN (Asks user to enter PIN). This mode is not applicable if Two Feedback Line is selected in previous step
4. Enter **Timeout** within which the feedback is sent by controller to the terminal
5. If Feedback Line is set as "One feedback line", then each feedback message i.e. **Granted**, **Denied**, and **PIN** can have different pulse width and pulse interval. An administrator can define the same as below:
   a. **High**: If an administrator select High, then Pulse Width and Pulse Interval of the feedback message will be as per system default value for high pulse
   b. **Low**: If an administrator select Low, then Pulse Width and Pulse Interval of the feedback message will be as per system default value for low pulse
   c. **Custom**: If an administrator select Custom, then the field for editing Pulse Width and Pulse Interval is enabled and an administrator can customize the pulse as below:
      i. The **Pulse Width** can vary between 50 to 1000 milliseconds
      ii. The **Pulse Interval** can vary between 50 to 1000 milliseconds and value 0. (When the pulse interval is set to 0 the terminal expects to receive one pulse with the width specified by Pulse width setting)
   d. **None:** This option is available for Access Denied feedback only. It indicates that on no response from controller feedback, for Access Denied, the terminal can show timeout or access rejected message. You can configure whether to consider timeout as reject. Refer step 6.
   e. **Default value for customer fields is as below:**
      i. For **Access Granted** – Pulse width and interval is 100ms, by default
      ii. For **Access Denied** – Pulse width and interval is 200ms, by default
      iii. For **PIN** – Pulse width and interval is 300ms, by default

6. **Consider Timeout as Reject:** This function is valid for Access Denied feedback only. If it is enabled, then on timeout the LCD text specified for Access Rejected will be displayed on terminal LCD. If 'Consider timeout as Reject' is unchecked, "Timeout" message will be displayed on LCD.
7. Enter **Keypad Timeout**, for user to enter the PIN. This is used when Panel Mode selected as Accept/Reject/PIN and controller feedback contains PIN (asks user to enter PIN).
8. Click on Save

Section 20 : **OSDP Protocol Support**

Description

MorphoAccess® SIGMA Family MorphoWave® Compact terminals is able to to communicate with external Control Panel (CP) using OSDP (Open Supervised Device Protocol). OSDP is a communication protocol that allows Peripheral Devices (PD) such as MorphoAccess® SIGMA Family MorphoWave® Compact terminals to interface with Control Panels (CP) or other security management systems. Security Industry Association (SIA) has developed this protocol to foster interoperability among security devices.

The Peripheral Devices (PD) respond to the commands received from external Control Panel (CP). The protocol supports interfacing of one or more Peripheral Devices (PD) to a Control Panel (CP). The communication between CP and PD is in the form of 'interrogation/reply' mode. The communication is only initiated by CP through OSDP commands. CP can communicate to the PD's in unicast mode or in a broadcast mode, the CP needs to use the address 0x7F for broadcasting to all PD's. The PD responds to the OSDP commands via OSDP responses.

Terminal Configuration

The OSDP feature is present in MA5G mode.

The parameters of the OSDP feature are the following:

Parameter name	Value	Description
comm_channels_state.serial	0 - 1 (0 - Default)	start/stop communication over serial channel '0' - to disable '1' - to enable
OSDP.channel	0 - 1 (0 - Default)	Enable/disable the OSDP '0' - to disable '1' - to enable
OSDP.secure_connection	0 - 1 (0 - Default)	Enable/disable the OSDP secure connection '0' - to disable '1' - to enable
OSDP.device_serial_address	0 - 127 (127 - Default)	Contain the OSDP device identifier (Physical Device Address)

The terminal configuration to establish an OSDP connection over the RS485 serial link is the following:

- Connect RS-485 connecter cables to the RS_TX+ and RS_TX- i/o pin of terminal.
- enable the OSDP protocol (OSDP.channel = 1)
- enable the communication over serial channel (comm_channels_state.serial = 1)

The terminal configuration to establish a secure OSDP connection over the RS485 serial link is the following:

- Connect RS-485 connecter cables to the RS_TX+ and RS_TX- i/o pin of terminal.
- enable the OSDP protocol (OSDP.channel = 1)
- enable the OSDP secure channel (OSDP.secure_connection = 1)
- enable the communication over serial channel (comm_channels_state.serial = 1)

The other parrameters associated to the following features: PIN, BIOMETRIC, SCHEDULE, INTRUSION DETECTION… should be disabled or enabled according to the terminal and control panel usages.

For example:

To manage intrusion, the tamper detection shall be enabled (tamper.state = 1).

OSDP Commands and Responses

The OSDP commands and responses supported by MorphoAccess® SIGMA Family MorphoWave® Compact terminals are the following :

Request/Command (CP -> PD)	Responses (PD -> CP)
CP commands and PD responses	
osdp_ID : ID Report Request	osdp_PDID : Device Identification Report
osdp_CAP : Peripheral Device Capabilities Request	osdp_PDCAP : Device Capabilities Report
osdp_LSTAT : Local Status Report Request	osdp_LSTATR : Local Status Report
osdp_RSTAT : Reader Status Report Request	osdp_ACK : General Acknowledge, Nothing to Report
osdp_COMSET : Communication Configuration Command	osdp_COM : Communication Configuration Report
osdp_LED : Reader LED Control Command Note: amber color is replaced by yellow	2 possibilities - osdp_ACK : General Acknowledge, Nothing to Report - osdp_NAK : Negative Acknowledge – SIO Comm Handler Error Response
osdp_TEXT : Reader Text Output Command	
osdp_BUZ : Reader Buzzer Control Command	
osdp_POLL : Pool	3 possibilities - osdp_ACK : General Acknowledge, Nothing to Report - Report of an asynchronous command (osdp_BiomatchR) - Report of a terminal action (osdp_RAW, osdp_KEYPAD, osdp_LSTATR)
osdp_BIOMATCH : Scan and Match Biometric Template	First response : - osdp_ACK : General Acknowledge, Nothing to Report - osdp_NAK : Negative Acknowledge – SIO Comm Handler Error Response Asynchronous response if previous reply is osdp_ACK : - osdp_BIOMATCHR : Scan and Match Biometric Template
PD sends this following reply when it is already processing a command and a new command is submit by CP	
CP submits a command	osdp_BUSY : PD Busy Reply
PD sends these following replies via OSP_POLL	
Terminal's action/status change	osdp_RAW : Card Data Report, Raw Bit Array As soon as a smartcard is read by terminal, the terminal provides a GETID information to the Control Panel Note : The format code is the WIEGAND format. The wiegand format will be the wiegand format set in wiegand.event_verify_pass/wiegand.event_identify_pass parameters.
	osdp_KEYPAD : Keypad Data Report

	As soon as a PIN or a user_ID is entered on terminal, the terminal provides the GETID information to the Control Panel
	osdp_LSTATR : Local Status Report As soon as an intrusion is detected by terminal, the terminal returns this information to the Control Panel via osdp_LSTATR
Specific commands/replies to initialize an OSDP secure communication	
osdp_CHLNG : Challenge and Secure Session Initialization Request	2 possibilities - osdp_CCRYPT : Client's ID, Random Number, and Cryptogram - osdp_NAK : Negative Acknowledge – SIO Comm Handler Error Response
osdp_SCRYPT : Server Cryptogram	2 possibilities - osdp_RMAC_I : Initial R-MAC The secure session is established with the SCBK default key or with the SCBK custom key provided by osdp_KEYSET command - osdp_NAK : Negative Acknowledge – SIO Comm Handler Error Response
osdp_KEYSET : Encryption Key Set Command	2 possibilities - osdp_ACK : General Acknowledge, Nothing to Report The new SCBK custom key is set on terminal and osdp_CHLNG & osdp_SCRYPT should be sent again by control panel to establish a secure session with this new encryption key. - osdp_NAK : Negative Acknowledge – SIO Comm Handler Error Response

REMARK1: The osdp_Biomatch command enables the MA5G terminal to perform biometric scan and match it against the template provided in the command. CP can configure BIO_FORMAT parameter of BIOMATCH command as mentioned below.

Parameter name	Value
BIO_FORMAT	0x0 – Enables the MA5G terminal to use the template format specified by the terminal configuration parameter 'auth_param.template_type'. Please refer to **MorphoAccess® 5G Series – Parameters Guide** document for the supported formats. 0x1 – Not supported. Terminal responds with osdp_NAK with error code 0x09 0x2 –ANSI 2004 FMR

REMARK2: osdp_POLL command is used as general inquiry by the panel. The following are the possible responses for osdp_POLL command.

1. osdp_RAW: Terminal responds with this command when it completes the authentication process of smart card/external port/prox card/ identification.

   After authentication process, the terminal puts the user's Id into the polling queue in the form of wiegand format. The wiegand format is defined by the terminal's Wiegand configuration for Identification Pass/Fail and Verification Pass/Fail parameters.
2. osdp_KEYPAD: Terminal responds with this command when it completes the authentication process by keypad.
3. osdp_LSTAT: Terminal responds with this command when it detects tamper status.
4. osdp_BIOMATCHR: Terminal responds with this command when the biometric match process is completed by BIOMATCH command.

All above responses are logged in internal buffer of the terminal and they are sent as response to the osdp_POLL command in FIFO manner. If there is no response logged in the internal buffer of the terminal, then osdp_ACK is sent as a response to osdp_POLL command.

REMARK3: The supported baudrate are : 9600, 19200, 38400, 57600, 115200 for osdp_COMSET.

REMARK4: When a secure channel connection is established, the terminal remembers the key. To reset it, apply the reset contactless key command.

REMARK5: When the terminal is waiting for finger during a osdp_BIOMATCH command, osd_LED, osd_TEXT and osd_BUZZER commands are acknowledge without playing because the terminal executes its own MMI.

REMARK6: The Control Panel can obtain the capabilities of the MorphoAccess® SIGMA Family MorphoWave® Compact terminals with the osdp_CAP command. The PD will execute OSDP commands according to the terminal's capability.

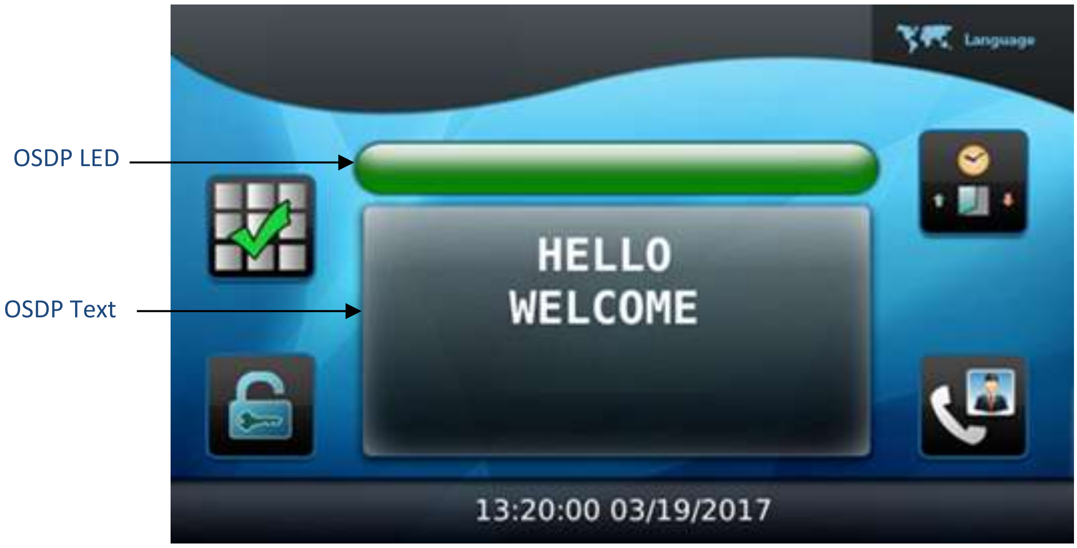
REMARK7: When secure OSDP is enable, terminal answers osdp_NAK to commands send in not secure protocol, except commands dedicated to initialize the secure communication and osdp_CAP, osdp_ID and osdp_COMSET, that are still supported.

Please refer to Open Supervised Device Protocol (OSDP) Version 2.1.7 on SIA Website https://www.securityindustry.org/Pages/Standards/OSDP.aspx for more details about te OSDP commands and replies.

Demonstration of osdp_LED and osdp_TEXT command for MorphoAccess® SIGMA terminal

OSDP exchanges between the CP and PD to update the Text and LED color on MorphoAccess® SIGMA terminal as depicted in the Figure 348.

Sequence	Tx/Rx	Command/Response Syntax with Example
1	CP -> PD (Start/Request of a command)	osdp_TEXT (0, 2, 0, 1, 6, 32, “HELLO WELCOME”) Syntax: osdp_TEXT (Reader Number, Text Command, Temp Text time, Row, Column, Text Length, String)
2	PD -> CP (Response to a command)	osdp_ACK in case of Success else osdp_NACK for failure
3	CP -> PD (Start/Request of a command)	osdp_LED (0, 0, 0, 0, 0, 0, 0, 0, 1, 10, 0, 2, 0) Syntax: osdp_LED (Reader number, LED Number, Temp Control Code, On time, Off time, On colour, Off colour, Timer LSB/Timer MSB, Perm Control code, On time, Off time, On colour, Off colour)
4	PD -> CP (Response to a command)	osdp_ACK in case of Success else osdp_NACK for failure



HELLO
WELCOME

13:20:00 03/19/2017

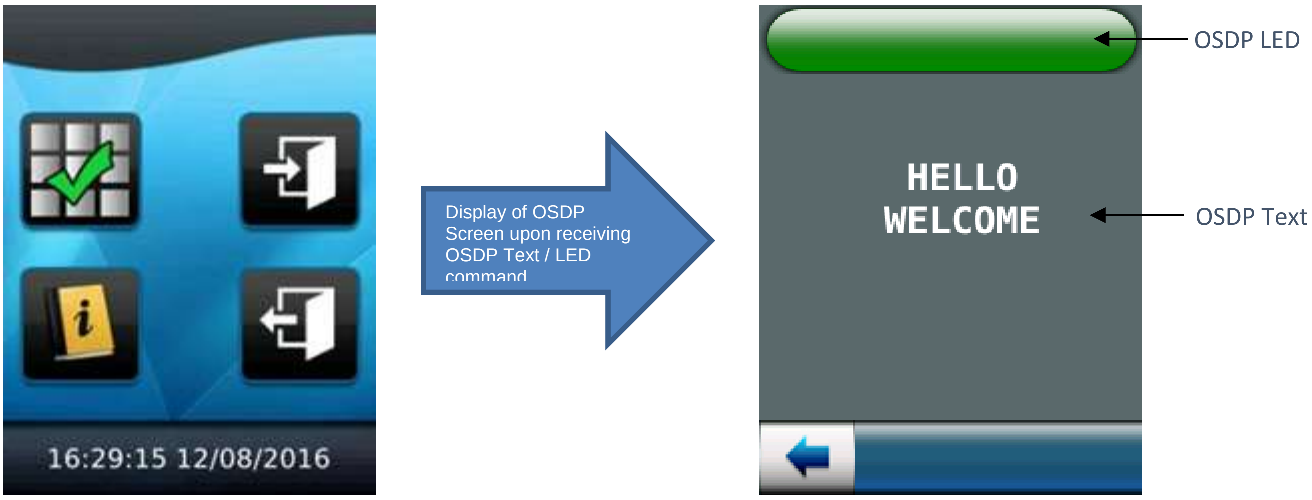
Figure 358: OSDP LED and TEXT Screen on MorphoAccess® SIGMA terminal

The MorphAccess® SIGMA and SIGMA EXTREME terminal integrates the OSDP display in the home display.

Demonstration of osdp_LED and osdp_TEXT command for MorphoAccess® Lite+ terminal

OSDP exchanges between the CP and PD to update the Text and LED color on MorphoAccess® SIGMA Lite+ terminal as shown in Figure 349.

Sequence	Tx/Rx	Command/Response Syntax with Example
1	CP -> PD (Start/Request of a command)	osdp_TEXT (0, 2, 0, 1, 6, 32, “HELLO WELCOME”) Syntax: osdp_TEXT (Reader Number, Text Command, Temp Text time, Row, Column, Text Length, String)
2	PD -> CP (Response to a command)	osdp_ACK in case of Success else osdp_NACK for failure
3	CP -> PD (Start/Request of a command)	osdp_LED (0, 0, 0, 0, 0, 0, 0, 0, 1, 10, 0, 2, 0) Syntax: osdp_LED (Reader number, LED Number, Temp Control Code, On time, Off time, On colour, Off colour, Timer LSB/Timer MSB, Perm Control code, On time, Off time, On colour, Off colour)
4	PD -> CP (Response to a command)	osdp_ACK in case of Success else osdp_NACK for failure


16:29:15 12/08/2016
Display of OSDP Screen upon receiving OSDP Text / LED command
OSDP LED
HELLO WELCOME
OSDP Text

Home Screen

OSDP Screen

Figure 359: OSDP LED and TEXT Screen on MorphoAccess® Lite+ terminal

The MorphoAccess® SIGMA Lite+ terminal has a dedicated full-screen display for OSDP.

The user can return to the home screen by clicking on the back button “⬅” on the OSDP screen. The OSDP screen will display again after 3 seconds.

Demonstration of osdp_LED command for MorphoAccess® Lite terminal

OSDP exchanges between the CP and PD to change the color of LED on MorphoAccess® SIGMA Lite.

Sequence	Tx/Rx	Command/Response Syntax with Example
1	CP -> PD (Start/Request of a command)	osdp_LED (0, 0, 0, 0, 0, 0, 0, 0, 1, 10, 0, 2, 0) Syntax: osdp_LED (Reader number, LED Number, Temp Control Code, On time, Off time, On colour, Off colour, Timer LSB/Timer MSB, Perm Control code, On time, Off time, On colour, Off colour)
2	PD -> CP (Response to a command)	osdp_ACK in case of Success else osdp_NACK for failure

Section 21 : User Control Configurations

User Control Configurations

User Control configurations consists the list of parameters which terminal should check for authenticating and granting access to the user. An administrator can enable or disable these parameters.

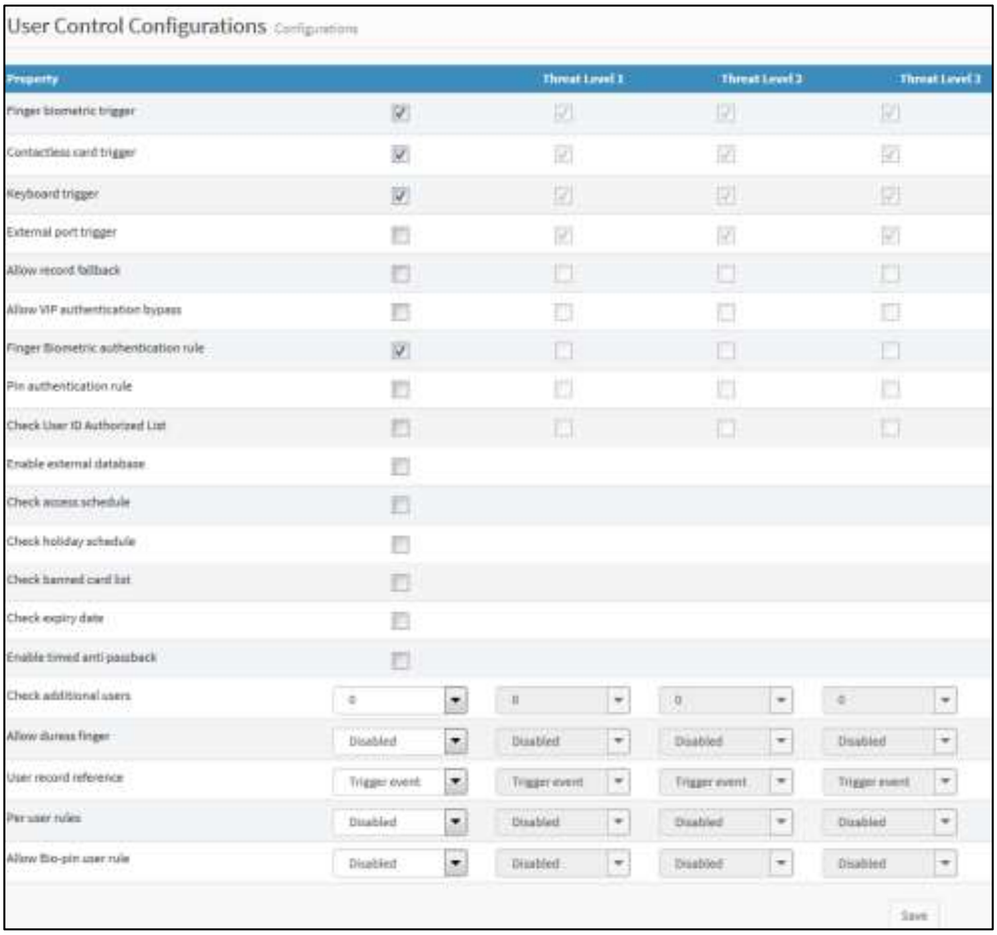
Besides Webserver, these configurations are possible via **MorphoBioToolbox** and distantcommands also.

User Control Configurations through Webserver

Access Path

Webserver > Control Configuration > User Control

Screens & Steps



User Control Configurations Configurations

Property		Threat Level 1	Threat Level 2	Threat Level 3
Finger biometric trigger	☑	☑	☑	☑
Contactless card trigger	☑	☑	☑	☑
Keyboard trigger	☑	☑	☑	☑
External port trigger	☐	☑	☑	☑
Allow record fallback	☐	☐	☐	☐
Allow VIP authentication bypass	☐	☐	☐	☐
Finger Biometric authentication rule	☑	☐	☐	☐
Pin authentication rule	☐	☐	☐	☐
Check User ID Authorized List	☐	☐	☐	☐
Enable external database	☐			
Check access schedule	☐			
Check holiday schedule	☐			
Check banned card list	☐			
Check expiry date	☐			
Enable timed anti passback	☐			
Check additional users	0	0	0	0
Allow duress finger	Disabled	Disabled	Disabled	Disabled
User record reference	Trigger event	Trigger event	Trigger event	Trigger event
Per user rules	Disabled	Disabled	Disabled	Disabled
Allow Bio-pin user rule	Disabled	Disabled	Disabled	Disabled

Figure 360: User Control Configurations from Webserver

For enabling the actions, check on the checkbox corresponding to the listed parameters as below:

1. **Finger Biometric Trigger:** A user control operation can be triggered by placing finger on the biometric sensor. An administrator can enable or disable Biometric trigger using this parameter.

   Note: *Access request using biometric will be triggered only if the user's biometric data is stored in the terminal's local database.*

2. **Contactless Card Trigger:** If this parameter is enabled, terminal starts access rights check, using authentication process, when a user card is detected by embedded contactless card reader. This parameter can be enabled or disabled for terminals having internal Smartcard reader or internal Prox card reader.
3. **Keyboard Trigger:** This parameter can be enabled to start access rights check, using authentication process, when a user ID is entered through terminal keyboard.
4. **External Port Trigger:** This parameter can be enabled to start access control check, using authentication process, when a data is received from an external device (such a swipe card reader) by Wiegand or Clock & Data protocol.
5. **QR Code Trigger:** This parameter can be enabled to start QR code control check, using authentication process, when a QR code is presented to the terminal.
6. **Allow Record Fallback:** To allow terminal to use references from database, if references from smartcard are not present. E.g. for smartcard triggered authentication, if BIO check is enabled and BIO data is not found on smartcard, and if this parameter is enabled, terminal will use biometric data corresponding to the user stored in the terminal database to perform BIO check. The user with the same User ID needs to be available on both the contactless card and the terminal.
7. **Allow VIP Authentication Bypass:** If this parameter is enabled then users in the VIP list are exempted from authentication checks (finger bio, pin, face), only if the trigger event comes from a trusted source i.e. Biometric or Contactless Card (but not Keyboard or External trigger source). Only the controls intended to validate a user's identity are suppressed.

   Note: Face capture is still performed if configured for *MorphoAccess SIGMA Series terminal*. Other checks such as access schedule, holiday schedule, banned card, authorized list, expiry date, trigger check, reference check, etc. are still performed normally. Refer to "*Access Control Process for VIP Users*"

8. **Finger Biometric Authentication Rule:** This parameter indicates whether terminal should check biometric of the user as a part of user control workflow.
9. **Pin Authentication Rule:** This parameter indicates whether terminal should check PIN of the user as a part of user control workflow.

10. **Check User ID Authorized list:** This parameter controls authorized list check during user control workflow. If enabled, the terminal will check whether user is in authorized list or not.
11. **Enable external database:** If enabled, the polling mode of the terminal will be activated, in that case user's data will be checked with the data stored in external database. Refer "*Polling Mode*" for understanding polling mode.
12. **Check access schedule:** This indicates whether terminal should check the access schedule before granting access to the user
13. **Check holiday schedule:** This indicates whether terminal should check the holiday schedule before granting access to the user
14. **Check banned card list:** If this parameter is enabled, terminal searches for users card in banned card list before starting user's authentication. The user's presented contactless card serial number is checked against the contactless card serial numbers stored in the banned card list of the terminal.
15. **Check expiry date:** If this parameter is enabled terminal will check the expiry date of user account.
16. **Enable timed anti passback:** If this parameter is enabled then the repeated access control for a user till **Timed Anti Passback Timeout** is not allowed on the terminal.
17. **Check additional users:** Specifies the number of additional users to check before granting the access. Set this parameter value to either 0 (no additional users required) or 1 (one additional user required). When this feature is activated, the terminal evaluates the access rights with the data of two different users, instead of the data of only one user. It means that, when access right is based on biometric data check, the terminal requires the fingerprint of two different users to grant the access.

    Transaction logs will contain one line for each of the 2 users control operation but only second one could be sent as event. If a single user is successfully identified multiple times, the duplicates are ignored and the terminal again prompts for the additional user, until the workflow times out. If one of the users fails the workflow is interrupted.
18. **Allow duress finger:** This parameter indicates whether to allow duress finger detection or not. An administrator can select "Alarm only" to allow duress finger. If set to Alarm only, the standard workflow applies, but an additional "duress finger detected" event is raised before the eventual user control result.
19. **User record reference:** This parameter defines where the references for control are taken from. Possible values are "Trigger event" or "Terminal". If set to "Trigger Event" then reference source is based on trigger event i.e. reference is smartcard for smartcard trigger source and terminal for other trigger source. If set to "Terminal" then reference is terminal for all trigger source.

20. **Per user rules:** Defines additional rules reference (i.e. rules that add to terminal defined rules). Possible values are “Disabled”, “Trigger Event” and “Terminal”.
    a. If set to “Disabled”, then only terminal configuration defined controls are performed,
    b. If set to “Trigger Event”, then user rules are retrieved based on user control trigger source i.e. user rule retrieved from smartcard for smartcard triggered user control operation and user rule retrieved from terminal database for other trigger source.
    c. If set to “Terminal”, then user rule is retrieved from terminal database for all trigger source.

***Note**: If no user rules are specified for a given user because the field is missing on the card or in the terminal database, then the controls specified for all users in the terminal configuration will be applied.*

21. ***Allow Bio-pin user rule:*** This parameter can be enabled to allow terminal to substitute BIO check by a PIN check or BIOPIN check. For this substitution to work, “ucc.per_user_rules” parameter shall also be enabled, which allows only users with defined user rule (from DB or CARD) that allows BIO substitution. Possible values are “Disabled”, “Use Bio-PIN” or “Use PIN”.
    a. If set to “Disabled” then BIO check substitution is not allowed.
    b. If set to “Use Bio-PIN” then BIO check is substituted by BIOPIN check. BIOPIN data is only stored on smartcard. If substitution by BIOPIN is allowed and PIN control is also enabled, then BIOPIN is requested separately from PIN.
    c. If Set to “User PIN” then BIO check is substituted by PIN check. If substitution by PIN is allowed and PIN control is also enabled, then only one PIN check is performed
22. ***Face* authentication rule:** This parameter defines face authentication check workflow rule. Possible values are “Disabled”, “Photo taking”, “Face detection (optional)” and “Face detection (mandatory)”. This applies only to MorphoAccess® SIGMA Series terminal only. Please refer to the section “*Additional User Controls”* for understanding the face detection workflow
23. Click on **Save**

References

Refer to “*Recommended Conditions for Face Detection*” for knowing the correct position of the user and required lighting conditions for face detection.

Section 22 : **Event Configurations**

Event Configurations

Events which can be monitored in MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal are listed in 'Event' screen of Webserver. An administrator can enable or disable the monitoring and reporting events that can be triggered on terminal. An administrator can also configure which events are to be sent to access controller, GPO TTL lines and its data clock id.

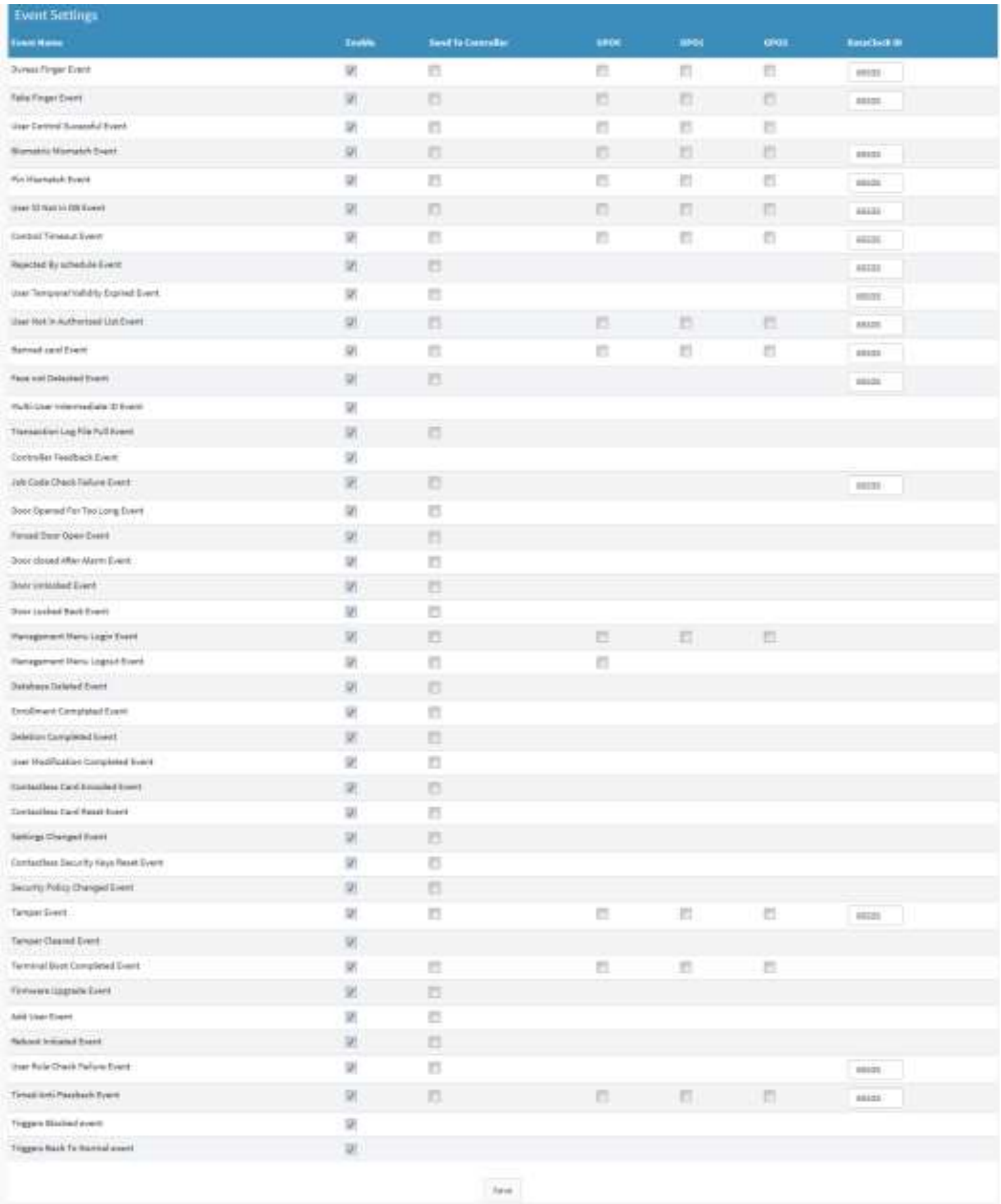
Besides Webserver, these configurations are possible via distant commands also.

Event Configurations through Webserver

Access Path

Webserver > Control Configuration > Event

Screens & Steps



Event Settings

Event Name	Enable	Send To Controller	GPO0	GPO1	GPO2	DataClock ID
Duress Finger Event	☑	□	□	□	□	65535
False Finger Event	☑	□	□	□	□	65535
User Control Successful Event	☑	□	□	□	□	
Biometric Mismatch Event	☑	□	□	□	□	65535
Pin Mismatch Event	☑	□	□	□	□	65535
User ID Not In DB Event	☑	□	□	□	□	65535
Control Timeout Event	☑	□	□	□	□	65535
Rejected By schedule Event	☑	□				65535
User Temporal Validity Expired Event	☑	□				65535
User Not In Authorised List Event	☑	□	□	□	□	65535
Banned card Event	☑	□	□	□	□	65535
Face not Detected Event	☑	□				65535
Multi-User Intermediate ID Event	☑					
Transaction Log File Full Event	☑	□				
Controller Feedback Event	☑					
Job Code Check Failure Event	☑	□				65535
Door Opened For Too Long Event	☑	□				
Forced Door Open Event	☑	□				
Door closed After Alarm Event	☑	□				
Door Unlocked Event	☑	□				
Door Locked Back Event	☑	□				
Management Menu Login Event	☑	□	□	□	□	
Management Menu Logout Event	☑	□	□			
Database Deleted Event	☑	□				
Enrollment Completed Event	☑	□				
Deletion Completed Event	☑	□				
User Modification Completed Event	☑	□				
Contactless Card Encoded Event	☑	□				
Contactless Card Reset Event	☑	□				
Settings Changed Event	☑	□				
Contactless Security Keys Reset Event	☑	□				
Security Policy Changed Event	☑	□				
Tamper Event	☑	□	□	□	□	65535
Tamper Cleared Event	☑					
Terminal Boot Completed Event	☑	□	□	□	□	
Firmware Upgrade Event	☑	□				
Add User Event	☑	□				
Reboot Initiated Event	☑	□				
User Rule Check Failure Event	☑	□				65535
Timed Anti Passback Event	☑	□	□	□	□	65535
Triggers Blocked event	☑					
Triggers Back To Normal event	☑					

Figure 361: Events Monitoring Configuration

1. Enable the monitoring of **Events** by selecting the checkboxes corresponding the event
2. An administrator can also select the events which are required to be **Reported to Controller**
3. Select the **GPO lines** using which events are passed to controller
4. Enter **Clock & Data ID**, corresponding to event that is passed to controller through Clock & Data protocol

Section 23 : **MMI (Man-Machine Interface) Configurations**

MMI (Man-Machine Interface) Menu

This section provides various configurations that an administrator can make to the terminal LCD.

Besides Webserver, these configurations are possible via **MorphoBioToolbox** and distant commands also.

MMI Features/Function name	SIGMA and SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite+ Series
Enable AZERTY Keyboard	✓	✗
Administration If this parameter is enabled, the information menu on the terminal shall be displayed)	✓	✓
Audio for successful Verification	✓	✗
Audio for Message Attention	✓	✗
Display Reason for Access Denied	✓	✗
Display Name on Access Granted	✓	✓
Brightness (Range of this parameter is 5-100)	✓	✓
Idle Screen Timeout (The administrator can configure the duration after which the terminal shall switch to Low Consumption Mode. The range of this parameter is 1-3600 seconds)	✓	✓
Idle Screen Video Brightness	✓	✗
Face Detection Timeout	✓	✗
Disable Sensor (In Low-Power Mode)	✓	✓

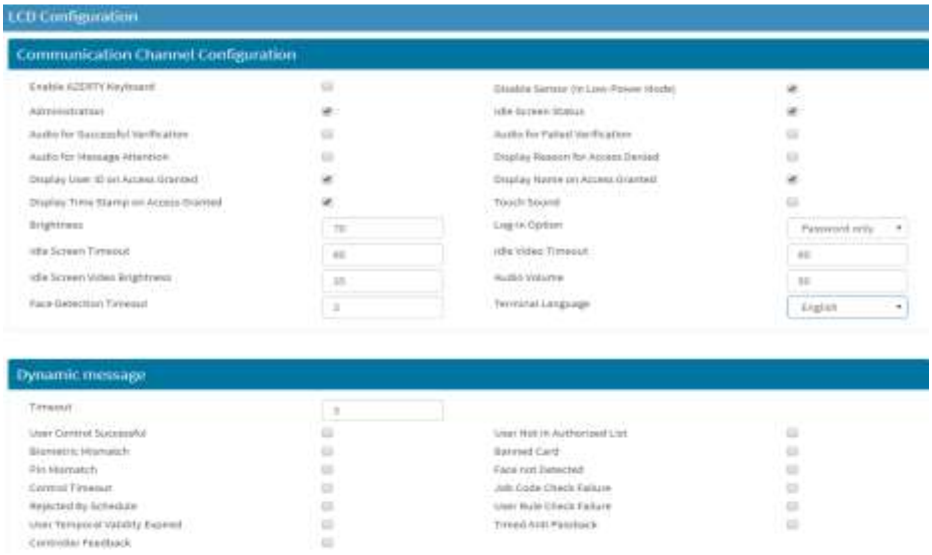
Idle Screen Status	✓	✓
Audio for Failed Verification	✓	✗
Audio for Tamper	✓	✗
Display User ID on Access Granted	✓	✓
Display Time Stamp on Access Granted	✓	✓
Log-in Option	✓	✗
Idle Video Timeout	✓	✗
Audio Volume	✓	✗
Terminal Language	✓	✗
Video Phone	✓	✗
Dynamic Message	✓	✗

MMI Configurations through Webserver

Access Path

Webserver > MMI (Man-Machine Interface)

Screens



LCD Configuration

Communication Channel Configuration

Enable AZERTY Keyboard	□	Disable Sensor (in Low-Power Mode)	☑
Administration	☑	Idle Screen Status	☑
Audio for Successful Verification	□	Audio for Failed Verification	□
Audio for Message Attention	□	Display Reason for Access Denied	□
Display User ID on Access Granted	☑	Display Name on Access Granted	☑
Display Time Stamp on Access Granted	☑	Touch Sound	□
Brightness	70	Log-in Option	Password only
Idle Screen Timeout	60	Idle Video Timeout	60
Idle Screen Video Brightness	35	Audio Volume	50
Face Detection Timeout	3	Terminal Language	English

Dynamic message

Timeout	5		
User Control Successful	□	User Not in Authorized List	□
Biometric Mismatch	□	Banned Card	□
Pin Mismatch	□	Face not Detected	□
Control Timeout	□	Job Code Check Failure	□
Rejected by Schedule	□	User Rule Check Failure	□
User Temporal Validity Expired	□	Timed Anti Passback	□
Controller Feedback	□		

Section 24 : Distant Commands Mode

Presentation of Distant Commands mode

Process

The administrator can configure the MorphoAccess® SIGMA Family or *MorphoWave®* Compact MDPI terminal in the Distant Commands mode. This operating mode allows controlling the MorphoAccess® SIGMA Family or *MorphoWave®* Compact MDPI terminal remotely via IP link or RS422 (Applicable to MorphoAccess® SIGMA, SIGMA Extreme and *MorphoWave®* Compact Series only). This is achieved by using a set of biometric and databases management commands.

In Distant Commands mode the Host System plays the master. It performs access control remotely, while the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal works as a slave waiting for external commands.

Commands are described in the **MorphoAccess SIGMA Family and MorphoWave Compact - Distant Commands Guide** document

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact MDPI terminal is driven through an Ethernet (or Wi-Fi™) link using TCP or SSL protocol.

The terminal acts as a server: it is either waiting for a command or executing a command.

Please refer to **MorphoAccess® 5G Series – Host System Interface Specifications**: this document explains how to remotely manage a terminal.

For further details about SSL on the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, please refer to the **SSL Solution for MorphoAccess® documentation**.

Distant Commands mode use sample

When terminal is use in Distant Commands mode, then the administrator can control several functions of the terminal. For example, if it is required to take the backup of terminal database, the administrator can take a backup.

The snapshot below describes a typical exchange between the terminal and the distant system for a basic access control by identification. One would see that the distant system is the master, while the terminal is the slave.

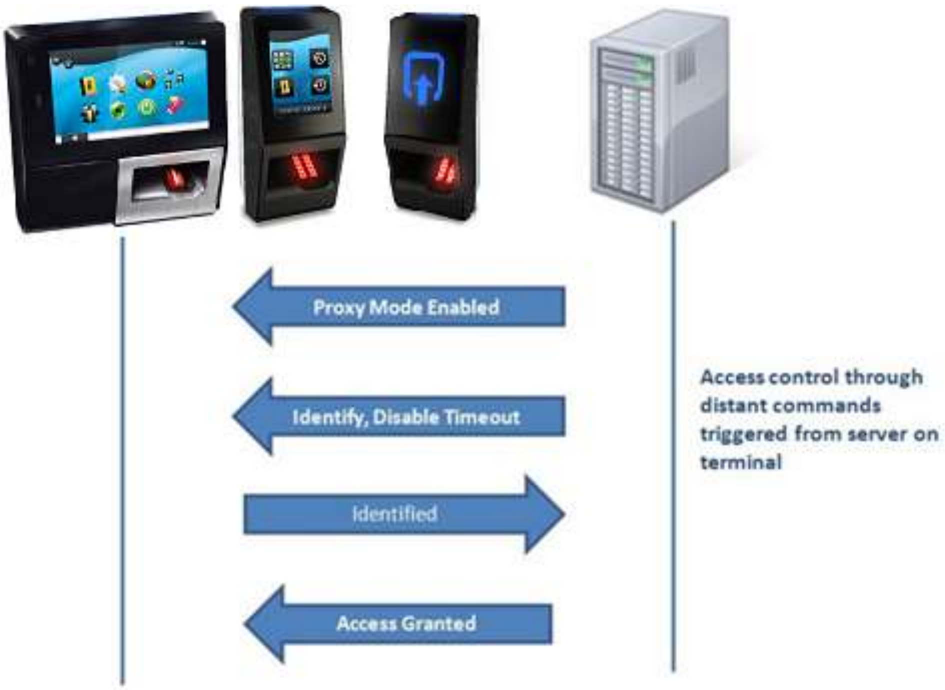

Proxy Mode Enabled
Identify, Disable Timeout
Identified
Access Granted
Access control through distant commands triggered from server on terminal

Figure 362: Distant commands sample with a remote Identification process

Section 25 : **Polling Mode**

Presentation of Polling mode

If the administrator enables the polling mode, the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal does not verify user template in its local database. This mode is useful when the user templates are stored in external database.

When authentication is initiated on the terminal, the terminal will expose the User ID to external controller via polling buffer; the terminal accepts distant commands that provide a reference, overriding the reference specified in parameter ucc.user_record_reference, the ucc.allow_fallback_rule and the user ref_check rule.

- If **ucc.per_user_rules** = If set to Auto with trigger as smartcard then user rule from smartcard will be used and NOT from one provided by distant command.
- If **ucc.per_user_rules** = If set to Terminal, then user rule provided by distant command will be used.
- If **ucc.per_user_rules** = If set to Disabled, then user rule check is disabled.

Process

Polling using buffer:

- The User ID will be queued in the terminal's queue. This, is polled by external application.
- External application waits for the User ID by polling the buffer. After receiving the User ID, it will search the template in its database. Thereafter, it sends the template to terminal for further authentication.
- The user is authenticated by the external terminal.

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal also has distant commands to retrieve status and data of the polling buffer. Please refer to **MorphoAccess® 5G Series – Host System Interface Specifications** guide, for more details.

Polling mode activation

The administrator can activate the Polling mode through **Webserver > Complete Configuration**. This is done by setting the parameter “**ucc.enable_external_database**” to ‘1’. Please refer to **MorphoAccess® 5G Series – Parameters Guide** to know as to how to set this parameter.

Section 26 : **Messages Sending**

Principle

The administrator can configure the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, to generate and send messages to another physical entity, upon the occurrence of specific events during the access control process.

The events that lead to generation and sending of messages sending are, as follows.

- Result of access rights check (after access request by a user)
- Internal log file full
- Tamper detected
- Time and Attendance actions
- Duress Finger detected

Please refer to **MorphoAccess® 5G Series – Remote Message Specification** for details regarding the message content.

Events

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal allows the administrator to select one or more events on which messages can be sent to the external controller. An administrator can enable or disable events using Webserver or distant command.

Please refer to "*Event Configuration*" in this document, to learn more on various events that can be selected.

Sending Interfaces

The administrator can choose the interfaces that will be available for the messages sending process.

By default, no interface is available. The administrator needs to set the parameters mentioned below for activating remote sending message:

Number of available interfaces	
remote_msg_conf.send_ethernet_state	• This parameter can be set as "1" to enable message sending over Ethernet
remote_msg_conf.send_serial_state	• This parameter can be set as "1" to enable message sending over Serial Interface

For each interface available, the following parameters are customizable:

- Communication layer
- Protocol used
- Parameters depending on the layer and the protocol used.

TCP protocol is available on the IP layer. Following are the parameters that can be configured for host 1, in order to communicate via TCP protocol.

TCP parameters	
remote_msg_ip_conf.host_1_ip	• The IP address of the distant system.
remote_msg_ip_conf.host_1_port	• Port address to connect to
remote_msg_ip_conf.host_1_protocol	• Protocol Type used for communication through TCP channel
remote_msg_ip_conf.host_1_timeout	• Timeframe within which terminal is required to connect with the remote controller on host 1 and perform read/write operations.

The same parameters are configurable for host 2, in case the terminal is unable to connect to host 1 server. Terminal will now attempt to send message on host 2. Please refer to **MorphoAccess® 5G Series – Parameters Guide** for further details on interface configuration.

Send messages format is defined in **MA5G - Remote Message Specification.pdf** .

Section 27 : Compatibility with an Access Control System

Internal Relay activation on Access Granted result

Description

If the result of the access rights check is successful, the internal relay may be optionally activated, for example, to directly trigger a door switch.

The duration of the activation of the internal relay can be modified by a specific configuration key.

Access control installation using internal relay offers a lower security level, than an installation with a central access controller. In case of a centralized access, the decision to open the door is taken by a central host, thus making the process more secure.

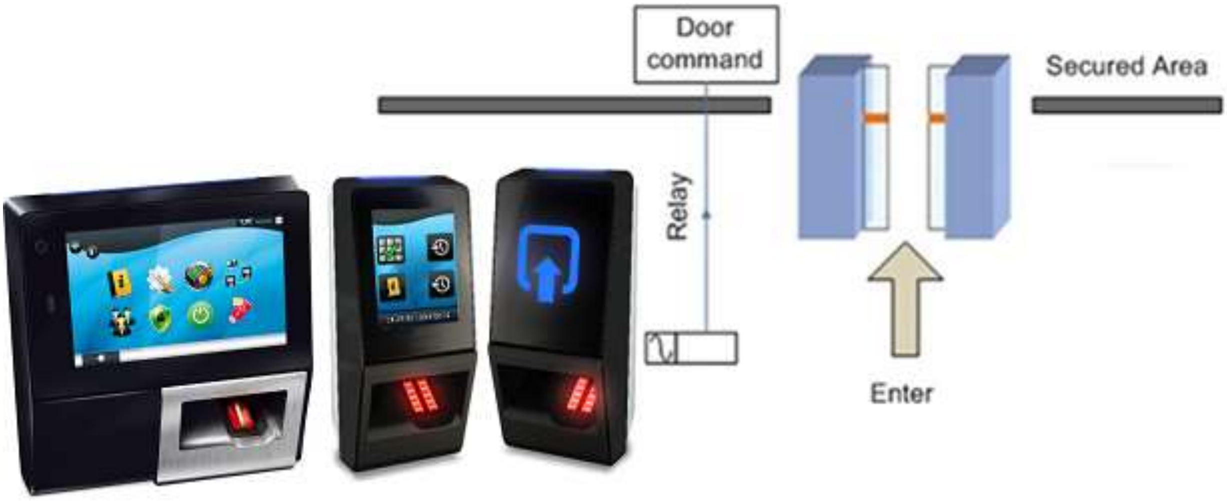


Figure 363: Using the internal relay on the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal

Activation key

The administrator can configure the following parameters. These parameters are related to internal relay activation, in the event of an access being granted.

Parameters	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
gpio.sdac_relay_default_state	✓	✗
gpio.func_mode	✓	✓
gpio.sdac_door_unlock_dur	✓	✓

Parameter name	Value	Description
gpio.sdac_relay_default_state	0 or 1	The administrator can set a default state of the internal relay, by using this parameter. The internal relay can be either, powered or unpowered. Select “0” for Low. This is the default value of this parameter and it indicates that by default the internal relay will be unpowered. On access being granted, the internal relay state will change to high (it will be powered). Select “1” for High. It indicates that by default the internal relay will be powered and on access being granted the internal relay state will change to low (it will be powered off).

Parameter name	Value	Description
gpio.func_mode	0, 1 or 2	Configuration for GPIO functional mode Select “0” to enable GPIO general mode (default)

		Select “1” to enable Threat Level mode Select “2” to enable SDAC mode

Configuration key

Parameter name	Value	Description
gpio.sdac_door_unlock_dur	2 - 60 sec. (10-Default)	The administrator can configure this parameter to set the duration for which SDAC door should be opened after access is granted. This parameter can be set only when gpio.func_mode is set as “2” (SDAC).

External activation of the internal relay

Description

The administrator can enable this function to allow the activation of the terminal internal relay via a push button connected between the LED1 and the GND wires. When this function has been enabled, the internal relay is activated in two cases: when the terminal authorizes the access after access rights check, and when a contact is closed between the LED1 and GND terminals.

A typical application of this feature is to open the door from inside an area protected by a MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal (as depicted in the figure below):

- To enter in the protected area the user must be successfully recognized by the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal,
- To exit from the protected area, the user presses a simple push-button connected between the LED1 and GND wires of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal.

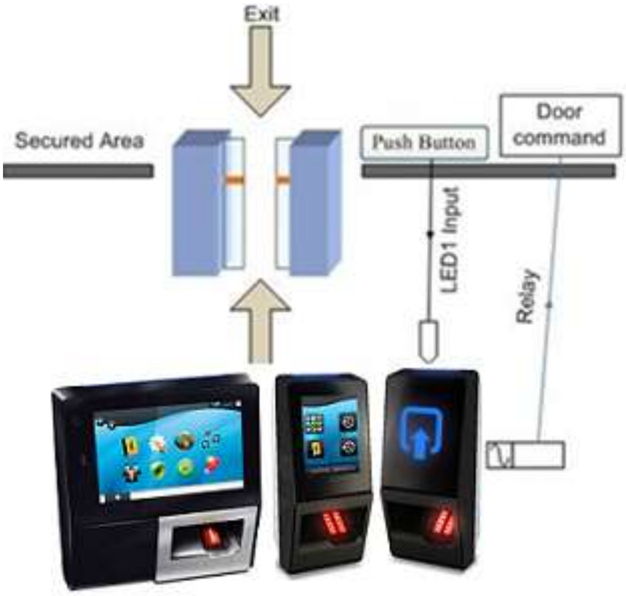


Figure 364: Internal relay activated by LED 1 signal

Activation key

A specific configuration key enables this feature.

Parameter name	Value	Description
gpio.sdac_rte_mode	0, 1	The administrator can set an exit mode in SDAC, by using this parameter. Following values can be configured: • "0" means None • "1" means Push Button. Push button exit mode is selected when a push button is located at exit gate and users are allowed to push the exit button to open the exit door.

Configuration key

Parameter name	Value	Description
gpio.sdac_rte_egress_timeout	1 to 300 Seconds (25–Default)	The administrator can define an egress timeout, by using this parameter. The 'egress timeout' is defined as the duration for which terminal will not generate an alarm, if door is opened by using a push button, manual or forced method of opening. No user control is performed within this duration. The door closes automatically, once the 'egress timeout' period elapses. For this to work gpio.sdac_rte_mode should be either set to 1 or 2 gpio.func_mode must be set to SDAC mode

Access Request Result Log File

Description

The administrator can enable this functionality so that, the terminal creates a record for each access request in a local log file. Each record includes:

- the date and the time of record creation (when access control result is known),
- the User ID or in other words, user's identifier (if available),
- the access control process executed (Identification, Authentication with biometric check, etc.),
- the result of the access control, which can be granted or denied. If denied then the reason could be user not recognized or access requested outside the authorized time slot, for an instance).
- and other data used for statistical reasons.

Log File format

The transaction log feature is available in two formats :

- "Basic Mode "
- "Identified Mode"

The Identified format has :

- a field to associate a unique_id at each log
- a reading status to tag the log as read or as not read

This information helps administrator to retrieve or erase records based on unique log ID.

By default the transaction log format is in 'Basic Mode'.

It can be changed to 'Identified Mode' by configuring following parameter :

Parameter name	Value	Description
transaction_log.format	0 or 1 (0 – Default)	• Set "0" to configure transaction log in 'Basic Mode'.

		• Set “1” to configure transaction log in ‘Identified Mode’.

For more information, refer to the **MorphoAccess® 5G Series – Host System Interface Specifications** document.

NOTE: When ‘transaction_log.format’ parameter value is changed from current value, all previous transaction log entry will be erased on next reboot of terminal and new entry will be stored according to mode.

Maximum capacity to store logs will be restricted to 100 000 logs for ‘Identified Mode’ log format, even though terminal is having license (MA_1M_LOGS) of 1 000 000 logs.

Log File management

Three commands are available for log file management:

- a command which returns the current status of the log feature (enabled/disabled, number of records),
- a command which returns the content of the log file,
- a command that deletes the log file.

For more information about these commands, refer to the **MorphoAccess® 5G Series – Host System Interface Specifications** document.

Log File size

The capacity of the internal log file is customizable by installing “

Log licenses”. The maximum capacity and the default number of logs that can be saved depend of the Series of terminal.

When the capacity off the internal log file is full, the logging process will stop automatically. Depending on the terminal settings, a WARNING message may be sent to a distant system.

The format of the “Log File Full Warning” message is described in the **MorphoAccess® 5G Series – Remote Message Specification** document.

Activation key

The administrator can enable or disable the creation of a record for each access request, by using only one configuration key.

Parameter name	Value	Description
transaction_log.logging	0, 1 or 2 (2 – Default)	• The administrator can configure this parameter to select the type of transaction logging that is carried by the terminal. • Set "0", to disable transaction logging • Set "1", to enable access control logging. It means only user access requests (regardless of the outcome), along with access timings and corresponding user details are logged. • Set "2", to enable full logging. Full logs include record of each action performed on terminal.

Sending an Access Control Result Message

Presentation

The administrator can configure the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal to send a message which contains the result of the access control, to a distant terminal. It can send the access control result using different channels and different protocols. The administrator can configure the protocol and channel of communicating the access control result.

This message can be used for different actions, depending on the role of the receiver in the access control system: simple logging of access requests (no response expected), or performing additional checks on access rights (expected response: access authorized or denied).

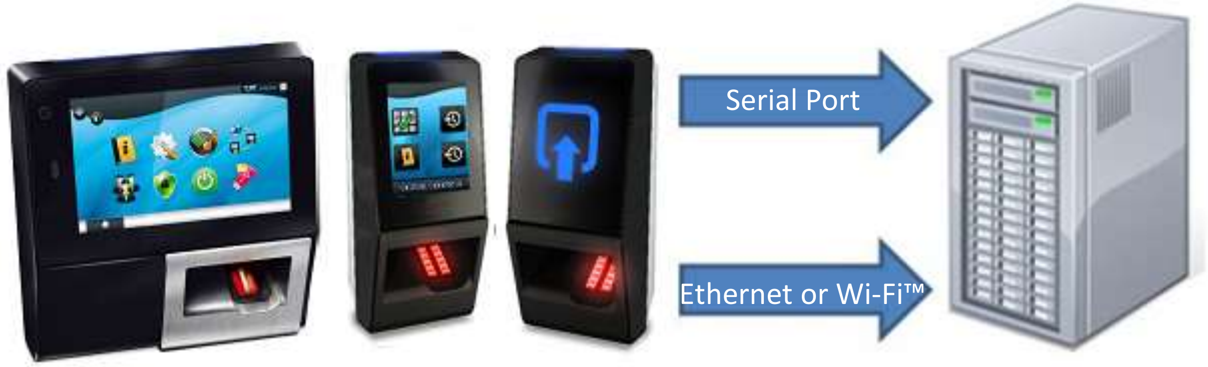


Figure 365: Sending access control result message to a distant system

Ports and protocols

The MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to send the access control result messages to a distant system, using the following ports and protocols:

- Serial Port: Wiegand or Clock & Data or RS485 or RS422.
- Ethernet or Wi-Fi™ link: UDP or TCP or SSL.

This is detailed in the sections that follow.

Please refer to **MorphoAccess® 5G Series – Remote Message Specification** for more information about the format and the protocol used for sending the access control result messages.

Serial Port (Output only)

Feature/Function name	SIGMA Series Wave Compact	SIGMA Lite Series
Wiegand or Clock & Data protocols (For Serial Communication)	✓	✓
RS485 (Serial Protocol)	✓	✓
RS422 (Serial Protocol)	✓	✗

Protocol selection

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal has two serial ports:

- One for Wiegand or Clock & Data protocols
- One port for RS485 or RS422 protocols

Wiegand protocol

The Wiegand frame includes only the User Identifier (which must be a numeric value).

By default, the message is sent only when the local access control result is positive (access authorized). But this message can also be sent when the result is negative (access denied). In this case, the User Identifier is replaced by an error code indicating the reason for access denial.

The activation and format of the outgoing Wiegand frame can be configured by the administrator through Webserver. Please refer to "*Wiegand Parameter Settings*" under Webserver.

The administrator can activate the Wiegand output by configuring the following parameter:

Parameter name	Value	Description
wiegand.external_port_output_type	0 or 1	The administrator can set the external port output type, by configuring this parameter "0": it indicates external port type is Wiegand.

Clock & Data protocol

The description provided for Wiegand protocol (see previous section) applies to Clock & Data protocol as well.

The sending of the message is conditioned to only one configuration key.

Parameter name	Value	Description
wiegand.external_port_output_type	0 or 1	The administrator can set the external port output type, by configuring this parameter “1”: it indicates external port type is clock & data.

RS422/RS485 protocol

The administrator can configure to send the access control result message via RS422/RS485 protocol for MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal. RS422 is not supported by MorphoAccess® SIGMA Lite Series terminals. The message is sent irrespective of the access control result. It contains more information than the Wiegand and the Clock & Data frames:

- date and time
- user Identifier (if available),
- result from the local access right (authorized, denied, reason for deny).

The administrator can configure the following parameters. For more details, please refer to the section below.

Parameter name	Value	Description
remote_msg_conf.send_serial_state	0 or 1	The administrator can select remote message sending state over Serial channel, by using this parameter. Select “0”, to disable message sending on serial port. Select “1”, to enable message sending on serial port.

Ethernet port

Protocol selection

The administrator can configure the terminal to send the access control result messages via an Ethernet link. The protocol could be one of UDP/TCP and TLS/SSL.

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal is able to send message to two different distant system: one preferred host (host # 1) and one alternative host (host #2).

Parameter name	Value	Description
remote_msg_ip_conf.host_1_protocol or remote_msg_ip_conf.host_2_protocol	0, 1 or 2	The administrator can set a protocol type that will be used for communicating with remote controller host 1, by using this parameter. Set to "0", for using TCP protocol for communication Set to "1", for using UDP protocol for communication Set to "2", for using TLS/SSL over TCP for communication

For details on configuration of other parameters that help in managing the process of sending remote message to access controller, please refer to **MorphoAccess® 5G Series – Parameters Guide.**

For details about SSL protocol, please refer to **SSL Solution for MorphoAccess®** document.

Wi-Fi™ Channel

The administrator can configure the terminal to send the access control result messages via a wireless Wi-Fi™ b/g connection, instead of Ethernet connection. Please refer to "*Wi-Fi™ Network Configuration* Wi-Fi™ Network Configuration" section for more information.

The message format and the protocols supported are the same as for the Ethernet channel: UDP, or TCP or SSL.

⚠**WARNING**: The terminal cannot be connected through Ethernet and through Wi-Fi™, simultaneously.

Note about Terminal Clock Deviation

The message sent through IP and RS422 or RS485 protocols includes the date/time of access control result.

Please refer to "*Date / Time synchronization*" section for more details.

Section 28 : Terminal User Interface

Audio Man Machine Interface

Audible signal

The administrator can tune the volume of the audible signal by tweaking the following configuration key. The terminal can be configured to emit an audio signal, in the event of access being granted or denied or the terminal being tampered, for an instance.

Parameter name	Value	Description
audio.volume	0 to 100	The administrator can set global audio volume that will be played on specific events, by using this parameter (default value is 50).

Terminal States

Identification, Authentication or Multi-factor mode: waiting for a finger or a card

- In identification mode, the terminal is waiting for a finger to be placed on the biometric sensor.
- In Authentication mode, the terminal is waiting for a user's card close to the embedded contactless smartcard reader.
- In multi-factor mode, the identification mode and one of the authentication modes are activated simultaneously. Then the terminal is expecting a finger on the biometric sensor or a card close to the smartcard reader.

Authentication mode, after presentation of a card, waiting for a finger or biometric data acquisition of the finger is in progress

After reading a user's card, the terminal emits this signal while waiting for a finger or when the acquisition of the biometric data of the finger placed on the sensor is in process. Do not remove the finger while this signal is emitted.

Identification: Finger detected, Acquisition of biometric data of the finger is in process

After detection of a finger on the biometric sensor, the terminal emits this signal during the entire biometric data acquisition process. Do not remove the finger while this signal is emitted.

Identification or Authentication: database blank or absent

This signal is emitted when, the activated mode requires a database but the database is either not created or is empty.

Incorrect finger position

The terminal emits this signal when the position of the finger on the biometric sensor is not good enough, for an image capture. Please remove the finger from the biometric sensor and follow the recommendations detailed in "*SIGMA Family Series* Finger Placement Recommendation" section.

Biometric Sensor start up error

The terminal fails to start the biometric sensor. If the trouble persists after restarting the terminal, please contact our customer service.

Maintenance: terminal configuration in process

This signal indicates that a configuration operation is in process, whether by TCP or by USB mass storage key. The current operation can be one of the following: management of the biometric database, modification of a configuration key, management of the log file, etc.

In this state, the terminal ignores all access requests by users.

Terminal in Low Consumption Mode

When terminal is in idle mode, a video is played till the configured video play duration. Once Video play duration has elapsed, terminal stops playing video and shifts to Low Consumption Mode indicated by LED blinking. This state is applicable for MorphoAccess® SIGMA, SIGMA Lite+ and SIGMA Extreme Series only.

Maintenance: Biometric Sensor firmware update

This signal is emitted when the biometric Sensor firmware update is in progress. This update occurs at first startup of the terminal after terminal firmware update.

Change Key OK

This signal is emitted when the Card is encoded and it is detected as an Admin Card and the corresponding keys on the card are written correctly.

Change Key Not OK

This signal is emitted when the Card is encoded and it is detected as an Admin Card. However, the corresponding keys on the card are incorrectly written.

Maintenance: USB mass storage key can be removed

This signal is emitted when the USB Mass Storage key, used to configure the terminal, can be safely removed from the USB port. The USB Mass Storage key must be removed to complete the maintenance process.

Anti-tamper alarm

This signal is optionally emitted when the terminal has detected opening of the terminal (except lateral USB port cover), or separation from the wall support.

Access Emergency

This signal is optionally emitted when the terminal has detected opening of the door forcefully of door not closed properly.

Time Override Mode

This signal is emitted when the Time Override is enabled. The buzzer beeps only during the beginning on the last 1 minute of TOM and plays continuously during the last 30 seconds.

Access Request Result

Identification or Authentication - Access granted

The user is authenticated and the access is allowed.

Identification or Authentication - Access denied

The user is not authenticated, or the access is not allowed to the given user (by Time Mask feature or by the Central Access Controller).

Authentication - Timeout while waiting for finger on the sensor

Authentication mode only: time-out occurs while waiting for a finger on the sensor

Finger removed too early

The terminal emits this signal when the finger is removed before the end of biometric data acquisition.

Enrolment

Waiting for a finger

The enrolment sequence is launched and the terminal is waiting for a user to place a finger on the biometric sensor.

Acquisition in process

The user has placed a finger on the biometric sensor and is awaiting completion of the acquisition process (notified by the Acquisition complete event).

Current positioning - Acquisition complete (but not enrolment sequence)

The current acquisition is complete and the user may remove their finger from the terminal.

Current capture complete – Remove finger from terminal to proceed with next finger

The current capture is complete and the user is invited to remove the finger from the terminal. The next capture will not start until the finger has been removed from the terminal.

Current finger – Acquisition complete (but not enrolment sequence)

The current finger acquisition has completed with success and the user has just removed finger from the terminal. If acquisition of another finger is required, the terminal will emit the Waiting for finger signal.

Enrolment complete

The enrolment sequence has completed successfully. Depending on how long the biometric data registration process has taken, the terminal may emit the signal Enrolment complete – Registration of biometric data in process.

Enrolment Error

The enrolment sequence has not completed successfully. Depending on how long the biometric data registration process has taken, the terminal may emit the signal Enrolment Failed.

LED – Buzzer Sequence

For MA SIGMA / SIGMA Extreme Series & MorphoWave® Compact

Terminal States	Biometric Sensor backlight	Status LED (On top of the terminal)	Buzzer
Identification, Authentication or Multi-factor mode: waiting for a finger or a card	OFF	🔵🔵🔵🔵	
Authentication mode, after presentation of a card, waiting for a finger or biometric data acquisition of the finger is in progress	Fixed Red	🔵🔵🔵🔵	
Identification: Finger detected, Acquisition of biometric data of the finger is in process	Fixed Red	🔵🔵🔵🔵	
Identification or Authentication: database blank or absent	OFF	🔵🔵🔵🔵	
Waiting for distant system command	OFF	🔵🔵🔵🔵	
Incorrect finger position	OFF	🔵🔵🔵🔵	
Biometric Sensor start up error	OFF	🔵🔵🔵🔵	
Maintenance: terminal configuration in process	OFF	🔵🔵🔵🔵	
Terminal in Low Consumption Mode	OFF	🔵🔵⚪⚪🔵🔵	
Maintenance: Biometric Sensor firmware update	OFF	🔵🔵🔵🔵	
Maintenance: USB mass storage key can be removed	OFF	🔵🔵🔵🔵	2 medium pitched notes
Anti-tamper alarm	OFF	🔵🔵🔵🔵	Low pitched notes
Identification or Authentication - Access granted	Insignificant	🔵🔵🔵🔵	1 second high pitched notes

Terminal States	Biometric Sensor backlight	Status LED (On top of the terminal)	Buzzer
Identification or Authentication - Access denied	Insignificant	●●●●	1 second low pitched notes
Timeout while waiting for finger on the sensor	Insignificant		1 second low pitched notes
Finger removed too early	OFF		
Waiting for a finger	Fixed Red	●●●●	
Acquisition in process	Fixed Red	●●●●	
Current positioning - Acquisition complete (but not enrolment sequence)	Fixed Red	●●●●	High 0.5 Sec Beep
Current capture complete – Remove finger from terminal to proceed with next finger	Fixed Red	●●●●	
Current finger – Acquisition complete (but not enrolment sequence)	Fixed Red	●●●●	
Enrolment complete	Fixed Red	●●●●	

For MALite Series

Action	LED						Buzzer
	●	●	●	●	●	●	
	Red	Green	Blue	Yellow	Purple	Cyan	
Default MMI when Database is Empty and only Biometric Trigger is Enabled				√ (Blink)			
Default MMI when Database is Empty and Trigger is not Biometric			√				
Default MMI when Database is not empty and only Biometric Trigger is Enabled							
Default MMI when Database is not empty and Trigger is not Biometric			√				
Distant Session is Open					√ (Blink)		
Distant Command Cancelled	√						

Action	LED						Buzzer
	🔴	🟢	🔵	🟡	🟣	●	
	Red	Green	Blue	Yellow	Purple	Cyan	
USB Key Detected							√
USB Script In Progress					√ (Blink)		
USB Script Successful		√					√
USB Script Error	√						√
First Boot up on MALITE without card reader	√			√			
First Boot up on MALITE Prox	√		√				
First Boot up on MALITE Multi	√						
First Boot up on MALITE iClass	√						
Change Key OK		√					√
Change Key Not OK	√						√
Alarm (15 times)	√ (Blink)						√
Access Emergency	√						√
TOM		√					√
Access Granted		√					√
Access Denied	√						√
Access Timeout	√						√
Place Finger				√ (Blink)			
Change Finger		√					
End of Acquisition							√
Enrolment Complete		√					√
Enrolment Failed	√						√
Missing Data from Card	√						√

Section 29 : Compatibility Accessories, Software Licenses and Software Applications

Compatible Accessories & Software Licenses

The following items can be ordered directly from IDEMIA or from an official distributor, in order to leverage all the benefits of being a MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal administrator.

- Power supply units,
- Power Over Ethernet module: enabling POE capabilities on the terminal,
- Contactless smartcards: MIFARE® 4K; DESFire® 2K, 4K or 8K, HID iCLASS®, Prox®
- MA WI-FI™ PACK: containing a Wi-Fi™ USB dongle and a Wi-Fi™ license to activate Wi-Fi™ capability on an administrator terminal,
- MA 3G PACK (Applies only to MorphoAccess® SIGMA Series): containing a 3G USB dongle and a 3G license to activate 3G network communication on an administrator terminal,
- Please refer to "*User database size licenses"* section for more details on the available licenses.
- Log size licenses (MA_250K_LOGS, MA_500K_LOGS, MA_1M_LOGS): enabling logs size upgrade from 100,000 to 250,000, 500,000 or 1,000,000. Requires µSD card in the terminal.

Compatible software applications

MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals are fully compatible with:

- The low level protocol using thrift commands, for more information, please refer to "**Host System Interface Guide**"
- Morpho Integrator's Kit (MIK) software development kit (version 6 or later).

Section 30 : **Recommendations**

Warning

The manufacturer cannot be held responsible in case of non-compliance with the following recommendations or incorrect use of the terminal.

General precautions

- Do not attempt to repair the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal by 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 void an administrator warranty.
- Do not expose the terminal to extreme temperature
- Only use the terminal with its original accessories. Attempts to use unapproved accessories with an administrator terminal will void an administrator warranty.
- Due to electrostatic discharge, and depending on the environment, synthetic carpeting should be avoided in areas where the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal has been installed.

Areas containing combustibles

It is strongly recommended that you do not install your MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal in the vicinity of gas stations, petroleum processing facilities or any other facility containing flammable or combustible gasses or materials.

Specific precautions for terminals fitted with a contactless smartcard reader

It is recommended to install MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminals equipped with a contactless smartcard reader at a certain distance (> 30cm) from metallic elements such as iron fixations or elevator doors. Performances in terms of reading the contactless badge from a distance will decrease when metallic elements are closer.

SD card

Feature/Function name	SIGMA Series SIGMA Extreme Series MorphoWave® Compact	SIGMA Lite Series
SD card support	✓	✗

- Even if the SD card is provided with the terminal, the administrator is advised to use branded ones such as Verbatim.
- Use the class card, having type 10 for better performances.
- Do not switch SD card from one terminal to another.

Ethernet connection

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

Extreme care must be taken while connecting Ethernet wire to the MorphoAccess® SIGMA Family or *MorphoWave®* Compact 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 synchronization

The terminal clock typically has a +/- 4 sec time deviation, per day at +25°C.

At 50°C, the time deviation may be up to +/- 8 sec per day.

For features requiring time precision (such as SSL protocol or DESFire® contactless card), the internal clock/calendar of the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal must be synchronized regularly with an external terminal (using the appropriated ILV command)

⚠ **WARNING:** Time deviation is a function of temperature and must be taken care of.

Cleaning precautions

A dry cloth should be used to clean the terminal, especially the biometric sensor.

The use of acid liquids, alcohol or abrasive materials is prohibited.

Recommended Conditions for Face Detection

User Face Position

- The user should face toward the terminal while identification/authentication
- The user should stand at the distance where terminal can recognize face (not too far or too close)
- The user should not wear glasses.

Lighting Condition

- The user shall not be against the light.
- The background of the user shall be as neutral as possible (avoid images which could be mixed up with the face)

Annex 1 : SIGMA Family Series Finger Placement Recommendation

Most Useful Areas for Biometric Data

The terminal is designed to capture the area containing the most useful biometric data. In fingerprints, this is usually at the center of the first phalanx.

This is illustrated in the figure below:

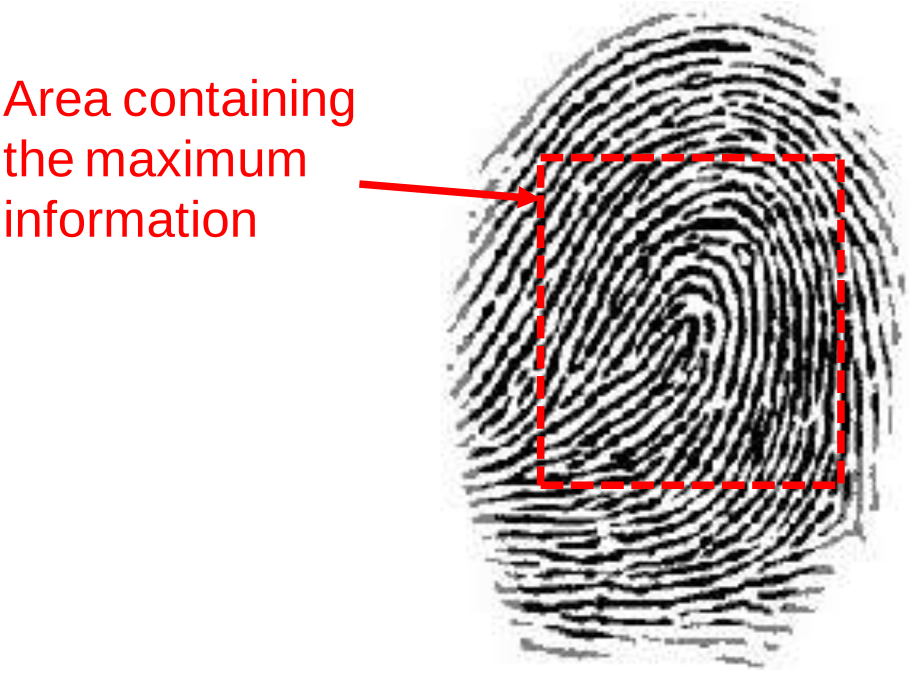


Figure 366: Most Relevant Biometric Data in a Fingerprint

The sensor is designed so that when the fingertip is in contact with the rounded hollow guide, the central zone of the first phalanx is aligned with that of the section dedicated to fingerprint capture.

Position of Finger

Finger Height

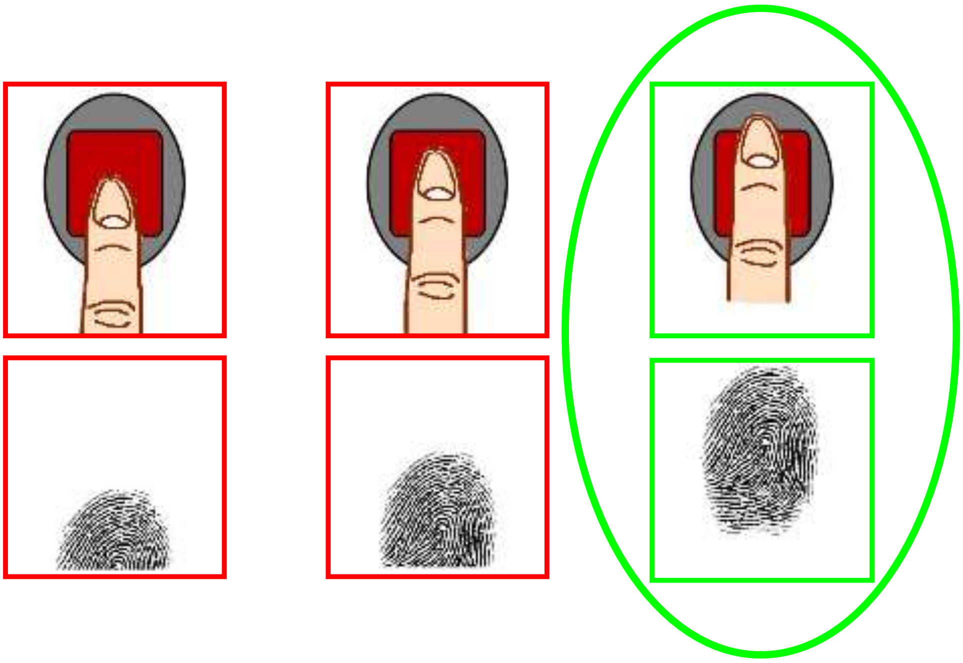


Figure 367: Finger Height

Incorrect Position:

- Do not place the finger tip on the top of the fingertip guide
- Do not place the finger tip on the surface of the sensor

Correct Position:

- Align center of 1st phalanx with sensor center

Finger Angle

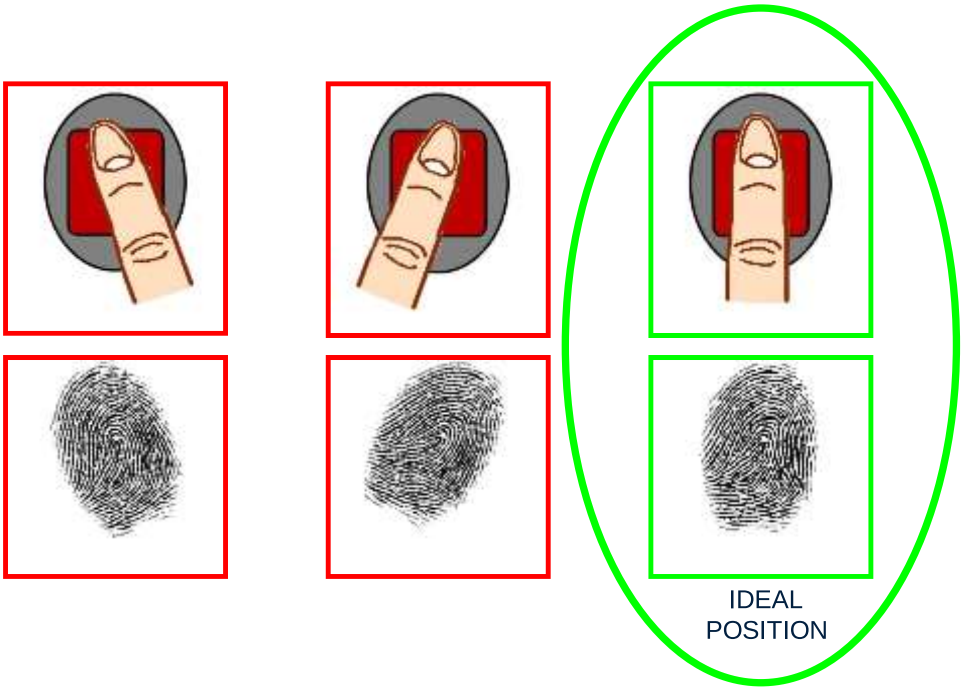


Figure 368: Finger Angle

Incorrect Position:

- Do not tilt the finger on right or left side of the sensor

Correct Position:

- The finger must be parallel to the sides of the sensor

Finger Inclination

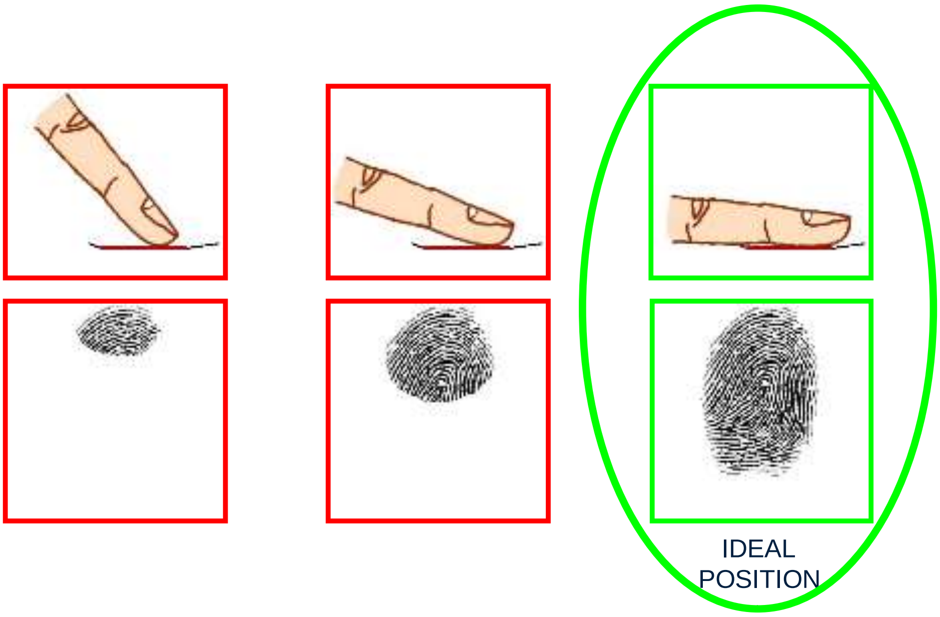


Figure 369: Finger Inclination

Incorrect Position:

- Do not leave the finger in the air
- Do not bend finger upward or downward

Correct Position:

- Finger must be parallel to the sensor surface

Finger rotation

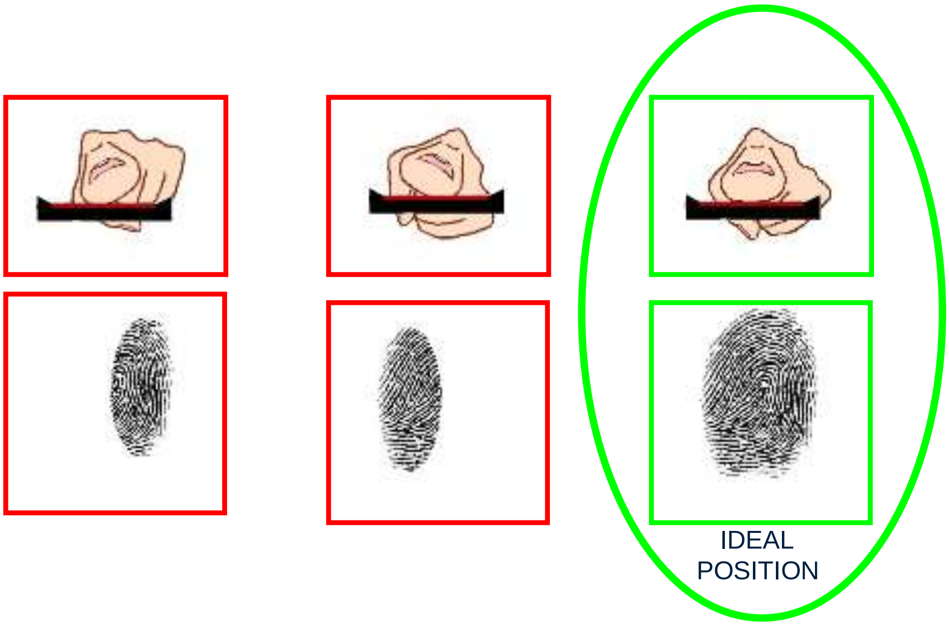


Figure 370: Finger Rotation

Incorrect Position:

- Do not roll finger

Correct Position:

- Finger must be parallel to the sensor surface

Finger Condition

When finger biometric data acquisition is difficult, please follow the recommendations listed below:

- The finger is cold
- Solution: warm up the finger
- The finger is wet
- Solution: wipe the finger
- The finger is dry
- Solution: warm up the finger and/or add a little bit of humidity
- The finger is dirty
- Solution: wash hands
- Remove bandages or adhesive tapes from the fingerprint area, and from the 2nd phalanx of the finger
- Do not press or tense finger to avoid blood vessels constriction

Annex 2 : Comparison of Authentication mode with Contactless Card

Contactless Modes Table

Operation	Actions Performed by Terminal
Authentication with biometric templates in database	• Read ID on contactless card. • Retrieve corresponding templates from the database. • Biometric authentication using these templates. • Send ID if authentication is successful.
Authentication with biometric templates on card	• Read ID and templates on contactless card. • Biometric authentication using these templates. • Send ID if authentication is successful.
Card mode authentication	• Read card mode, ID, templates (if required by card mode) on contactless card. • If card mode is « ID only », send ID. • If card mode is « Authentication with templates on card », biometric authentication using templates read on card, then send ID if authentication is successful.
Authentication with biometric templates in database – biometric control disabled	• Read ID on contactless card. • Check corresponding templates presence in database. • Send ID if templates are present.
Authentication with biometric templates on card – biometric control disabled	• Read ID on contactless card. • Send ID.
Card mode authentication – biometric control disabled	• Read card mode, ID, templates (if required by card mode) on contactless card. • Irrespective of the card mode, send ID.

Required Tags on Contactless Card

Operation	ID	CARD MODE	Template 1	Template 2	PIN	BIOPIN
Authentication with templates in database	Yes	No	No	No	No	No
Authentication with templates on card	Yes	No	Yes	Yes	No	No
Card mode authentication (ID_ONLY)	Yes	Yes	No	No	No	No
Card mode authentication (PKS)	Yes	Yes	Yes	Yes	No	No
Authentication with templates in database – biometric control disabled	Yes	No	No	No	No	No
Authentication with templates on card – biometric control disabled	Yes	No	No	No	No	No
Card mode authentication (ID_ONLY) – no PIN code check, no biometric check	Yes	Yes	No	No	No	No
Card mode authentication (PKS) – no PIN code check, with biometric check	Yes	Yes	Yes	Yes	No	No
Authentication by BIOPIN code check only	Yes	No	No	No	No	Yes
Authentication by PIN code check only	Yes	No	No	No	Yes	No

With:

- ID_ONLY: no PIN code check, no biometric check
- PKS: no PIN code check, with biometric check

Annex 3 : **Bibliography**

How to get latest version of the documents

The last version of the documents is available on a CD/ROM package from our factory, or can be downloaded from our web site at the address below:

www.biometric-terminals.com

(Login and password required).

To request a login, please send us an email to the address below:

support.bioterminals@idemia.com

Annex 4 : Glossary, Acronyms and Abbreviation

GLOSSARY

- **Access Controller/Controller:** This term is used for centralized access controller. Terminal communicates with controller for decisions regarding access, to the user.
- **Terminal:** This term is used for MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, unless explicitly specified.
- **Device:** This term is used for an external device attached to MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal, such as USB Mass Storage device.
- **Admin/Administrator:** A user who is authorized to manage the settings and user information of a fingerprint reader. Administrators can enroll or delete users and change terminal settings.
- **Capacitive Sensor:** A device that detects the voltage differences between the sensing surface and individual fingerprint ridges. MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal supports only Optical Sensor for better biometric performance.
- **Core:** A term used to describe an area of the finger-scan characterized by ridgelines with the tightest curvature and most unique content. Although the entire finger-scan has significant data, the "core" is the most data-intensive area and thus is extremely important to the algorithm. Normally, the core is located in the middle of the fingerprint.
- **Duress Mode**: A mode that offers users a way of indicating a duress situation (such as being forced to open a door). The user verifies with a specially designated finger resulting in an inverted Wiegand output that is detectable on certain Access Control Panels.
- **Finger Print Capture:** The process of extracting features of a fingerprint image obtained from a fingerprint sensor, and saving them into the internal memory of a device. The fingerprint data is called a fingerprint template.
- **User Enrolment:** creation of a record in a database with personal data of a unique user, or creation of a card with personal data of a user
- **Firmware:** The set of programs contained permanently in a hardware device (as read-only memory) that controls the unit.
- **Host Mode:** The normal mode of operation when the device is waiting for a card to be presented to the terminal.
- **Optical Sensor:** A device that detects the intensity or brightness of light. Morpho biometric sensors are used to create graphical representations of fingerprints.
- **Single Door Access Control (SDAC)**: The capability of controlling/monitoring all functions related to a single entry/exit point.
- **Software** The set of programs associated with a computer system.

- **Template:** A term used to describe the data that is stored during the enrolment process. The data is a mathematical representation of the ridge pattern of the enrolled finger scan.

- **Primary Template:** This is the template that resides in the first template slot on the smart card. When verification is initiated, this primary template is the first template that is used in that verification process.

- **Secondary Template:** This is an optional second template stored on the smart card that is also used in the verification process if the primary template verification fails.

- **Users:** The individuals that use a hardware system.

- **User Groups**: The sets of users grouped together in a system (usually by the similarity of the functions they perform).

- **1:1 Mode:** In 1:1 mode, a user enters his or her User ID first. Then the user is requested to provide a personal data such as place a finger on a sensor or enter a PIN. Then the acquired data is matched against the reference data linked to user ID (example: fingerprint found on users' card which provides the User ID at beginning of the process).

- **1:N Mode:** In 1:N mode, a user places his or her finger on the device without entering an ID. The terminal compares the user's scanned finger with the many enrolled fingers in its internal database.

- **Identification (Searching or 1:N):** The operation of Identifying a user by comparing a live finger scan against all stored finger-scan records in a database to determine a match. Identification uses the finger scan only - no cards or PINs. Identification is only available on devices that are in 1:N mode.

- **Authentication (1:1)**: The operation of confirming a user is who he claims to be by comparing a live finger scan image against a stored fingerprint template. The result (pass or fail) that is returned is based on whether the score is above a pre-defined threshold value. Some type of credential (PIN, Prox card, smart card, etc.) is necessary to initiate the biometric verification.

- **Webserver**: Webserver is a web-based application embedded in the MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal. Webserver enables the management of the settings of the terminal from any computer (desktop, laptop or a tablet) equipped with a compatible Internet browser and connected to the same network as the terminal.

- **SecureAdmin**: Client software for managing terminal configuration for MorphoAccess® SIGMA Family or *MorphoWave®* Compact terminal running in L-1 Bioscrypt Legacy mode

Acronyms and Abbreviations

- **AUX:** Auxiliary
- **LCD:** Liquid Crystal Display
- **LED:** Light Emitting Diode
- **MAC (address):** Media Access Control, a unique identifier assigned to network interfaces for communications on the physical network segment
- **IPv4:** Internet Protocol version 4
- **IPv6:** Internet Protocol version 6 - IPv6 is intended to replace IPv4, which still carries the large majority of Internet traffic (2013).
- **DNS:** Domain Name Server. It provides naming for all systems, computers, terminals in a network
- **DHCP:** Dynamic Host Configuration Protocol
- **TCP:** Transmission Control Protocol
- **UDP:** User Datagram Protocol
- **SSL:** Secure Sockets Layer
- **VIP:** Very Important Person. The users in the system can be enrolled under VIP list.
- **PIN:** Personal Identification Number
- **BIOPIN:** Biometric Personal Identification Number. The BIOPIN is used for authentication when biometric authentication is not required
- **F Key:** Function Key
- **MA:** MorphoAccess®, a generic name of the physical access control terminals by IDEMIA.
- **T&A:** Time and Attendance Mode
- **MMI:** Man Machine Interface
- **SDAC:** Single Door Access Control
- **GPIO:** General Purpose Input Output

Annex 5 : **Support**

Troubleshooting

Customer service

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A login and password are required to access the full site content. If an administrator doesn't have one, please send us an email to the address above to request one.

Contact by email is preferred.

November 19

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