

MorphoAccess™ Host System Interface Specification

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1 Conventions

This section presents acronyms, abbreviations, measurement units, and conventions used in this document.

1.1 ACRONYMS AND ABBREVIATION

Acronym/Abbreviation	Definition
MOBI	Biometric Modules
ILV	Identifier Length Value
SPILV	Service Protocol ILV
CRC	Cyclic Redundancy Check
STX	Start Text
ETX	End Text
MSB	Most Significant Bit
LSB	Least Significant Bit
PK	Characteristics points of a finger used by biometrics process

Table 1 : Acronyms and Abbreviations

2 Scope

2.1 IDENTIFICATION

This document defines the interface between a Terminal (MM110 or MorphoAccess™) and a host system (typically a PC). The following communication layers are described:

- Physical connection,
- Low level protocol,
- Application protocol.

2.2 SYSTEM ARCHITECTURE

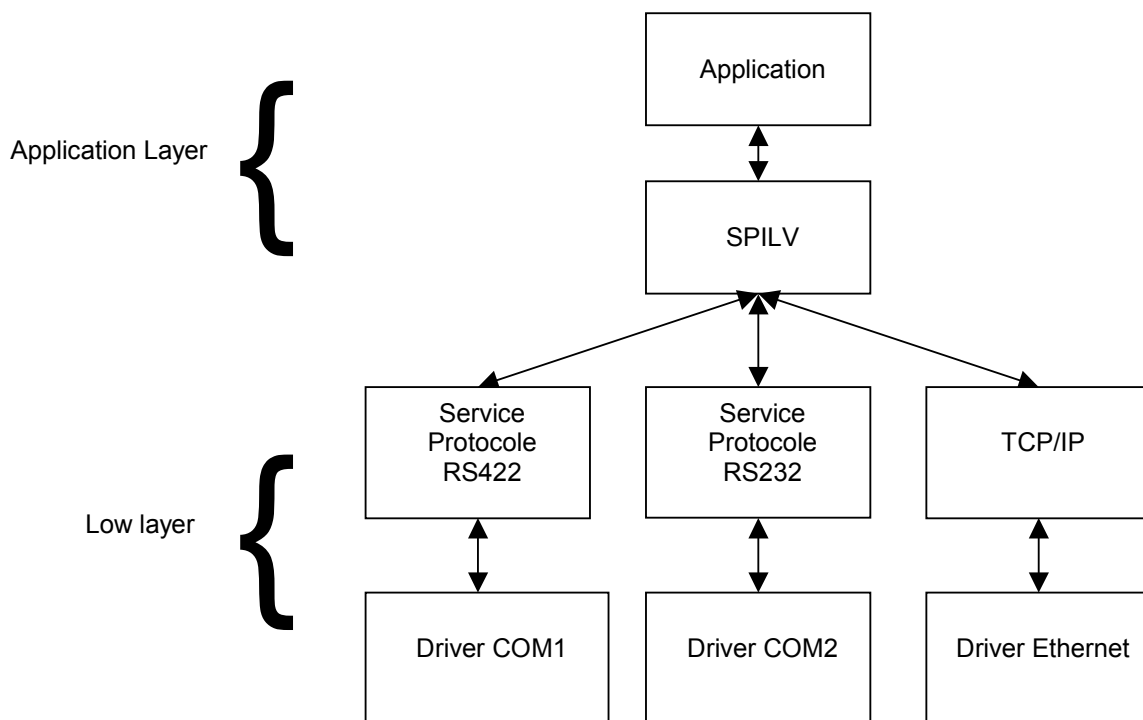


Figure 1 : MorphoAccess™ System Architecture

3 Physical layer

The physical layer between the Host and the terminal will be RS232, TCP/IP or RS422.

◆ RS232 Default Configuration :

Type: 3 wires: TX, RX, GND.
Baudrate: 9600 Bauds
Data bits: 7 bits
Parity: even
Stop bits: 2 bits
Flow Control: none

◆ RS422 Default Configuration :

Type: 4 wires: TX+, TX-, RX+, RX-.
Baudrate: 9600 Bauds
Data bits: 7 bits
Parity: even
Stop bits: 2 bits
Flow Control: none

◆ TCP/IP Default Configuration

IP Address : 134.1.32.214

◆ Wiegand Default Configuration

Id length : 26 bytes
Pulse Width : 50 μ s
Pulse Interval : 950 μ s

◆ Relay configuration

On old mother boards tow relays were available. Relay one was activated by default.
This relay is no more available.
Only relay 2 is now available and it is the default one.

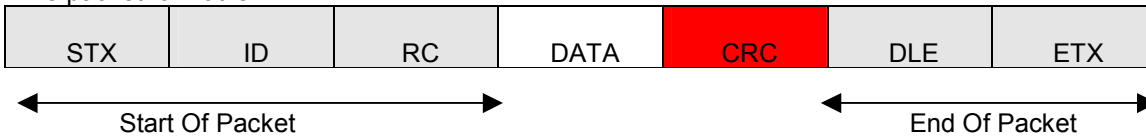
4 Low layer protocol

4.1 RS232 PROTOCOL

4.1.1 Definition

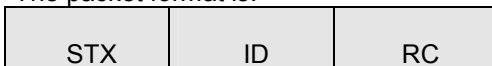
4.1.1.1 DATA PACKET STRUCTURE

The packet format is:



4.1.1.2 ACK PACKET AND NACK PACKET STRUCTURE

The packet format is:



4.1.1.3 ABBREVIATION

Fields name	Definition	Size (Bytes)	Value
<STX> :	Start Text	1	0x02
<ID>	Packet Identifier	1	--
<RC>	Request Counter	1	--
<DATA>	Data value	Up to 1024	--
<CRC>	Transmission error control	2	--
<DLE> :	Data Link Escape	1	0x1B
<ETX>	End Text	1	0x03

The maximum size allowed for a packet is 2058 bytes. (STX+ID+DLE+ETX+(RC+DATA+CRC)*2 [if stuffed])

4.1.1.4 BYTE ORDER

The packet byte order is Little Endian: multi bytes data are sent least significant byte first (LSB).

4.1.1.5 DATA

Data are formatted as I.L.V. packets.

4.1.1.6 STUFFING

- ♦ Software handshake capabilities (XON-XOFF) are preserved by replacing, in the <RC + Data + CRC>, all XON(0x11) / XOFF(0x13) characters by the couple <DLE> <XON+1> (0x12) or <DLE> <XOFF+1> (0x14).
- ♦ To prevent confusion with the frames sequences <STX><ID> and <DLE><ETX>, every <DLE> byte in the <RC + Data + CRC> is preceded by an extra <DLE> byte ('stuffing').
Stuffing must be processed before sending a packet and removed ('unstuffing') after receiving the packet. Notice that a simple <DLE> <ETX> sequence does not necessarily signify the end of the packet, as these can be bytes in the middle of a data string.
The end of a packet is <ETX> preceded by an odd number of <DLE> bytes.

4.1.1.7 CRC CALCULATION

The type of the CRC is CRC16 V41.

The CRC is computed as a function of the *Data* part before Stuffing.

The initial value is 0x0000.

4.1.1.8 PACKET IDENTIFIER

The identifier is formatted as follow:

Bit 7 (MSB)	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0 (LSB)
IN/OUT	F (First)	L (Last)	Reserved 0	Packet Type			

The MSB (Bit 7) is reserved for packet direction. Setting this bit set the direction to IN. Clear this bit to set the direction to OUT.

An OUT Packet is a packet sent by the Host to the MorphoAccess™.

An IN packet is a packet received by the Host from the MorphoAccess™.

Bit 6 (F) is reserved for Packet Order information. Set this bit when it is the first packet when transmitting a set of packets.

Bit 5 (L) is reserved for Packet Order information. Set this bit when it is the last packet when transmitting a set of packets.

Bit 4 is a reserved bit and must be clear.

The Bits 3 to 0 are used for packet identification:

The following packet type are implemented:

ID Value	Description
0x1	Data Packet
0x2	ACK Packet
0x4	NACK Packet

4.1.2 Frames sequence

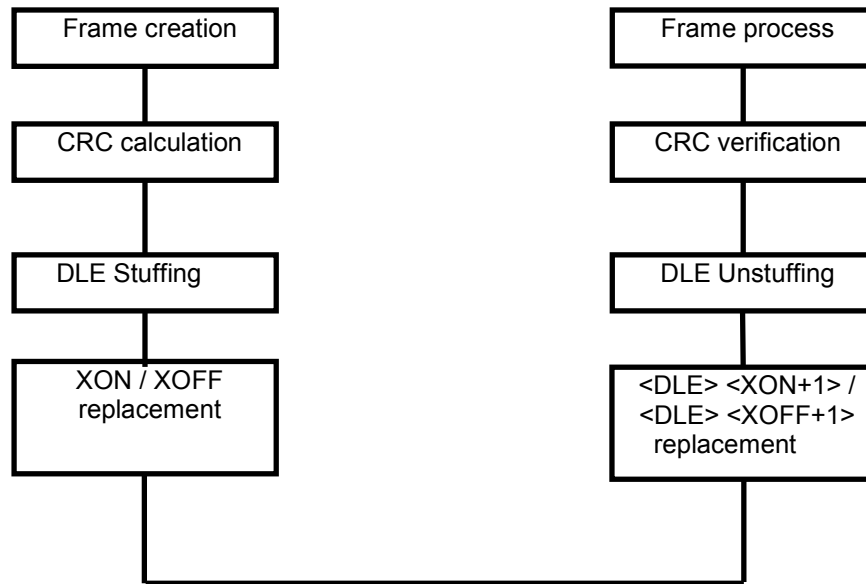


Figure 2 : Frames Sequence

4.1.3 Timing Characteristics

The maximum elapsed time between the transmission of two bytes of a frame is 100 ms.

4.1.4 Communication Error Case

The following error case must be detected:

- ◆ Timeout between the reception of two bytes (the timeout start after the reception of STX),
- ◆ Bad CRC verification,
- ◆ Unstuffing error (<DLE> is followed by an unexpected character).

4.2 RS232 SERVICE PROTOCOL

4.2.1 Request Counter management

The following rules have to be implemented:

- The RC of a data packet is filled with the current Counter value,
- The RC of an ACK (NACK) packet is filled with the RC of the data packet to ACK (NACK).
- On the reception of an ACK (NACK) packet, the RC is compare to latest data packet sent. If it is an ACK, the counter is increased on a hit. If several packets are received with the same RC, only one ACK is send.

Timing specification

The maximum elapsed time between the emission of a Packet Data and the reception of the ACK is 500 ms.

4.2.2 Error cases

- ◆ When a frame is not valid (Bad CRC, Unstuffing error, Rx Timeout), the receiver must send a NACK packet.
- ◆ When the transmitter is waiting for an ACK (NACK) packet, all other received packet must be ignored.

4.2.3 Typical Transations workflow

- ◆ Emission of a packet data that contain less than 1024 bytes of effective data.

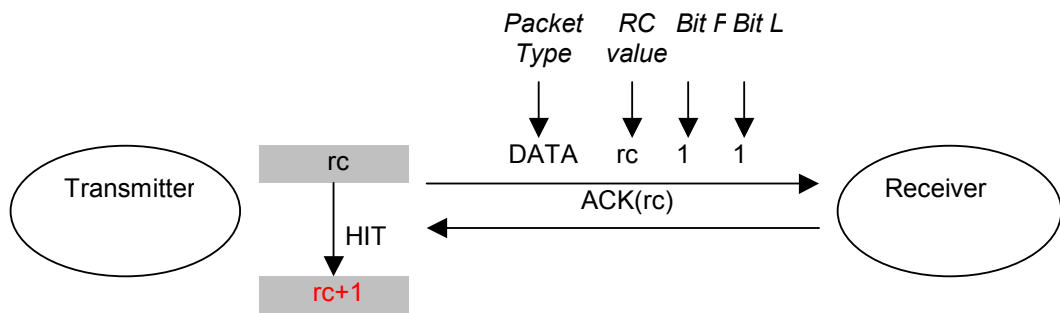


Figure 3 : Packet Transmission of Less Than 1024 Bytes of Effective Data

- ◆ Emission of a packet data that contain more than 1024 bytes of effective data.

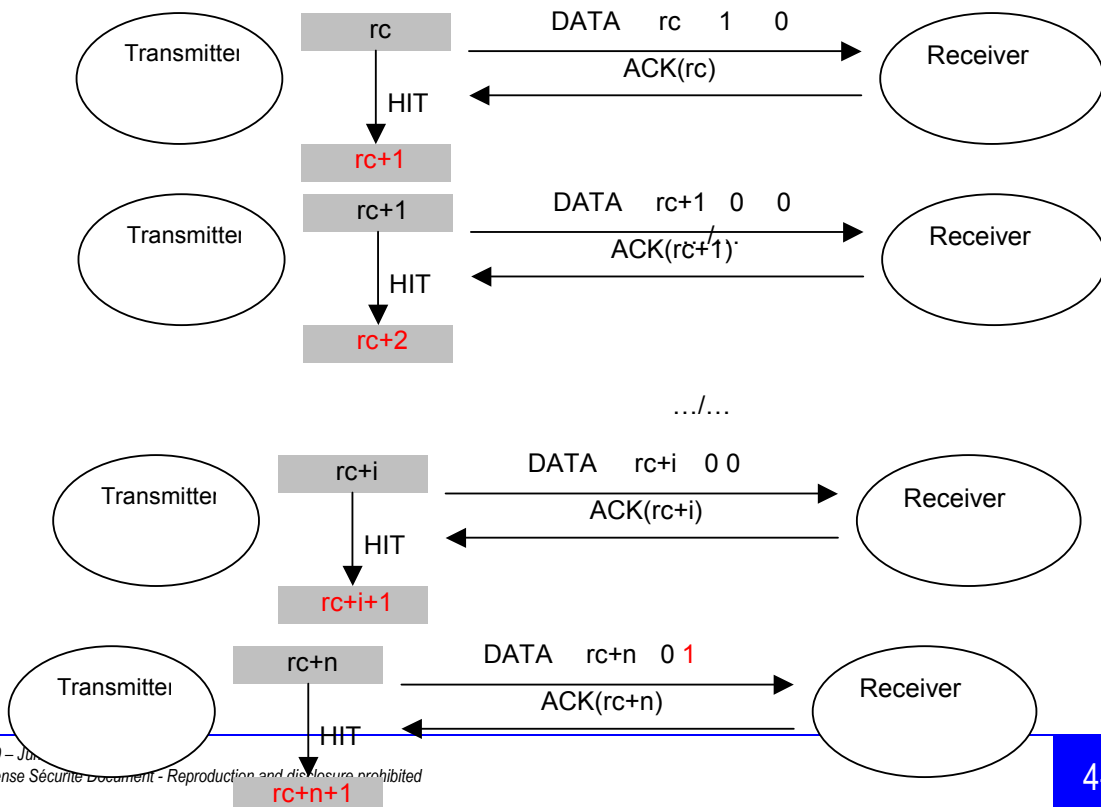
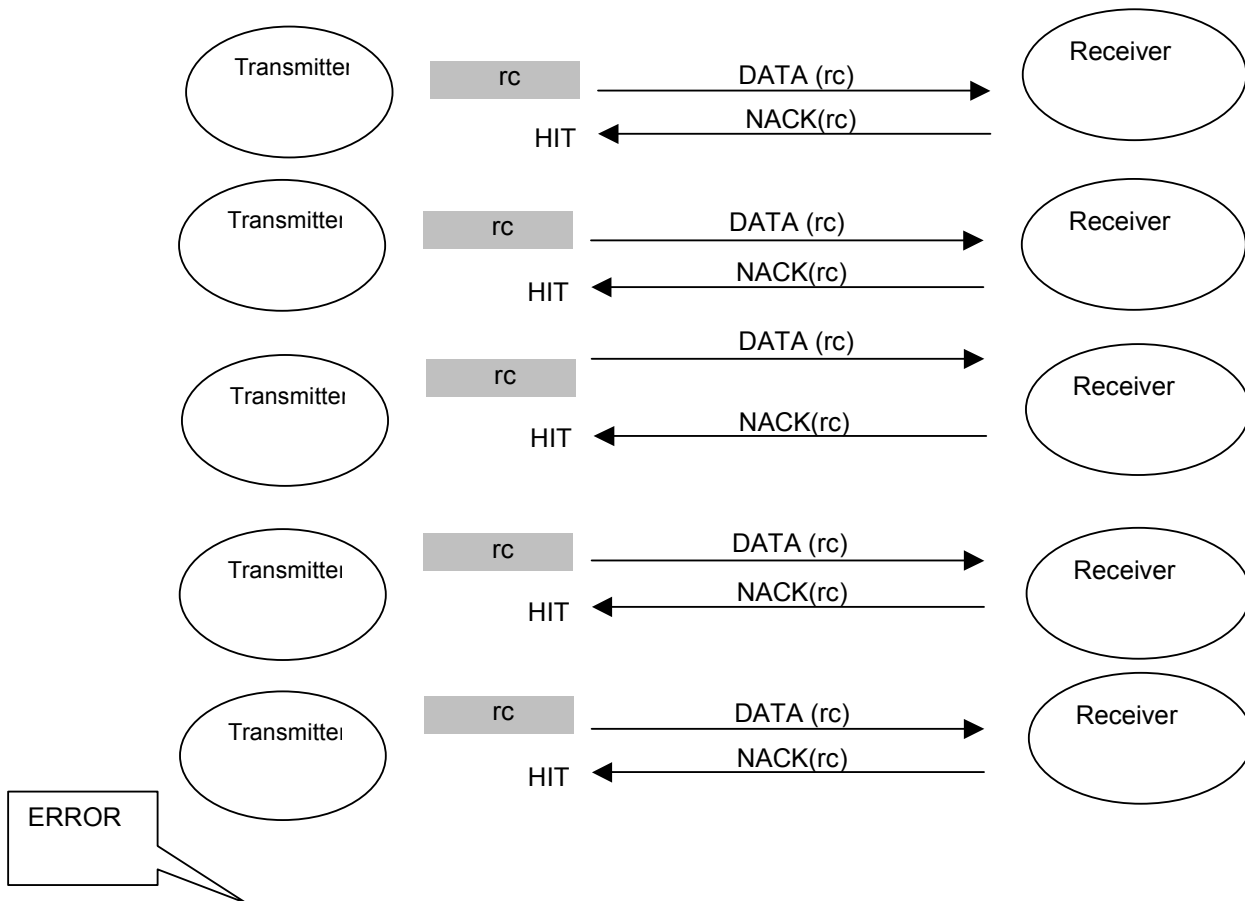


Figure 4 : Packet Transmission more than 1024 bytes

- ◆ An error occurred while transmitting the data packet



- ◆ The data packet is transmitted but the receiver don't transmit ACK or NACK.

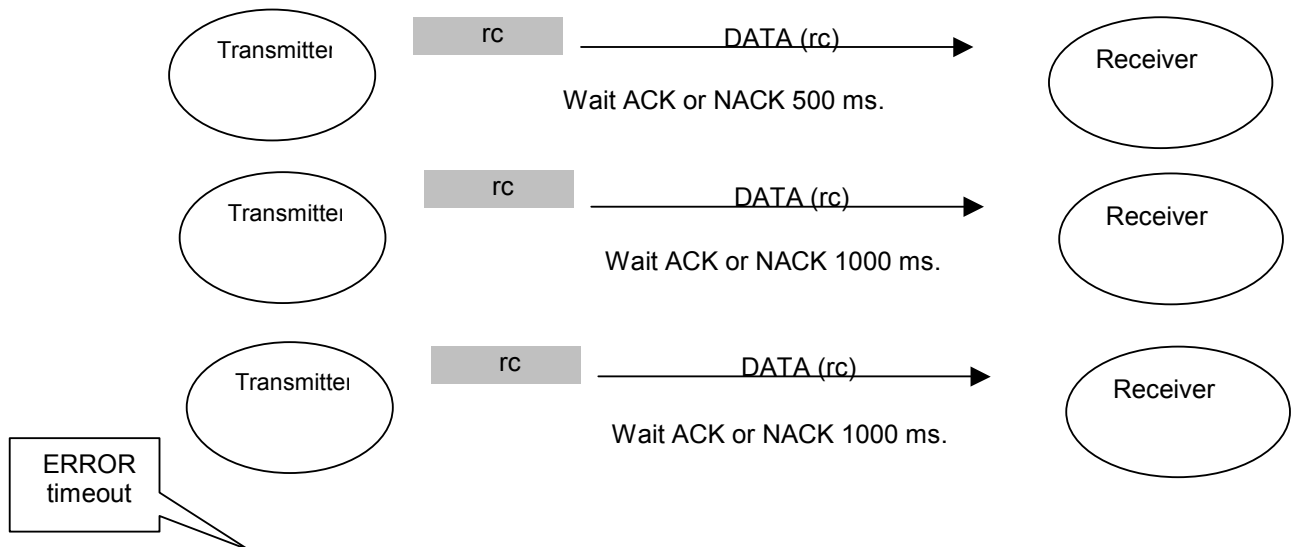


Figure 5 : Packet Transmission Errors

4.3 TCP/IP PROTOCOL

For using the TCP/IP protocol, the PC is configured as a client socket, whereas the MorphoAccess™ terminal is a server socket.

4.3.1 Port number

The socket is opened and closed with each command at the port 11010.

4.3.2 Byte Order

The packet byte order is Little Endian: multi bytes data are sent least significant byte first (LSB).

4.4 RS422 PROTOCOL

The RS422 protocol is implemented in the same way that the RS232 one, with the same default configuration. For the moment it is not possible to configure it sending an ILV, but directly via the MorphoAccess™.

5 Application Protocol

5.1 COMPATIBILITY AND RECOMMENDATION

This version of the documentation provides new commands allowing the initialisation or the configuration the MorphoAccess™ terminal. These additional commands are:

Initialization functions :

- ◆ **DEFAULT_INIT**
This function allows to initialize the module with the default configuration
- ◆ **GET_VERSION**
This function returns the serial number of the terminal, the revision of the software application and the type of MorphoAccess™.
- ◆ **REBOOT**
This function allows to reboot the MorphoAccess™ to initialize the application.
- ◆ **PING**
This function allows to verify that the terminal respond correctly.

Configuration functions :

- ◆ **SET_CONFIGURATION**
This function initializes the module using custom parameters.
- ◆ **GET_CONFIGURATION**
This function retrieves the system configuration.

Beware: there is some new return codes in this version. For every return request, it is advised to test the request status in order to check if its value is different from the ILV_OK.

Note : Beware: return codes can be changed in future versions.

The following table describes modifications of the previous interface.

AUTHENTICATE	Request	It's now possible to indicate the minutiae with the value ID_PKCOMP The timeout parameter is activated
	Reply	Changed the status code ILVERR_WAITING_BIO in ILVERR_BIO_INPROGRESS
ENROLL	Request	The timeout parameter is activated
	Reply	Changed the status code ILVERR_WAITING_BIO in ILVERR_BIO_INPROGRESS
IDENTIFY	Request	The timeout parameter is activated
	Reply	Changed the status code ILVERR_WAITING_BIO in ILVERR_BIO_INPROGRESS
ERASE BASE	Reply	Added ILVERR_BADPARAMETER in status code
ERASE_BASE_ALL	Reply	Added ILVERR_BADPARAMETER status code and ILVERR_BIO_INPROGRESS status code
ADD_BASE_RECORD	Reply	Changed the status code ILVERR_WAITING_BIO in ILVERR_BIO_INPROGRESS
GARBAGE_COLLECTOR	Reply	Added ILVERR_BADPARAMETER status Changed the status code ILVERR_WAITING_BIO in ILVERR_BIO_INPROGRESS
GET_BASE_CONFIG	Reply	Changed the status code ILVERR_WAITING_BIO in ILVERR_BIO_INPROGRESS

5.2 BASE STRUCTURE

The MorphoAccess™ Base format is :

- ◆ A Bio formatted base (With 3 Fields)
 - User Data
 - PKs
 - Internal Field
- ◆ Additional Fields (0 to 7) to store User Data.

User ID 25 bytes in ASCII	Pks 217 bytes * Nb Fingers	Additional Field 1 3 bytes	Additional Fields i Length limited to 128 bytes

} a record: a person
 } another person

Table 2: MorphoAccess™ Local Database Structure

Remarks :

- ◆ A person is represented by a record and can be found in the Database thanks to his User Id (Index in the database)
- ◆ The size of the PK buffer is 256 bytes while it is sent by the PC, 512 bytes during the biometric process and 217 bytes once it is stored in the database.
- ◆ Field one is reserved for administration purpose. When creating additional fields or to use the admin/user status feature, you must create this administrator field. First byte set to 1 enables administrator login. First byte set to 0 disables administrator login.
- ◆ The Additional Fields are defined in the *CREATE DATABASE* command description. Please refer to section 5-47.
- ◆ Given that memory size is fixed, as the number of fields increases (increasing the size of each individual record), the number of enrolled people the database can hold decreases. All the data stored in this base are ASCII characters strings.

5.3 COMMUNICATION PROTOCOL DATA STRUCTURE

The application data has three fields:

1. Identifier called I ; this is the identifier of the command,
2. Length called L; this is the length of the *Value* field in byte,
3. Value called V; this is the parameters or data.

This data structure is variable. The Value field can contain optional ILV formatted data. Its length is variable.

The I field has 8 bits length and the L field has 16 bits length, as shown below:

	Length	Value
1 byte	2 bytes	<Length> bytes

For a length value > 64k, the ILV is formatted as follow:

Identifier	Length	Length value	Value
1 byte	0xFFFF	4 bytes	<Length> bytes

Remarks : All the parameters are in bytes. Only ASCII or Corresponding table parameters are specified.

If a request doesn't correspond to a code function describes in following chapter, the code reply is CMD_INVALIDREQUEST = 0x50.

5.4 WHAT'S NEW IN 5.4 VERSION

5.4.1 Add authentication mode with keyboard ID

In « GET_CONFIGURATION » / « SET_CONFIGURATION » possibility to set and to get the parameter /cfg/Morpho Access Application/mode up to 6 (corresponds to the mode authentication with keyboard ID).

5.4.2 Minor Changes

The default Init of serial parameter (ID_COM1 and ID_COM2) are : Data bits 8 bits and Parity None.

5.5 SOFTWARE VERSION 5.3X

5.5.1 Facility code

In "GET_CONFIGURATION" / "SET_CONFIGURATION" commands the "Wiegand – Dataclock Option" section may change according to the "Facility Code" length.

If "Facility Code" value is between 0 and 255 the command does not change.

If "Facility Code" value is greater than 255 the field "Facility Code" will use 4 bytes and the Wiegand – Dataclock Option" section will be 7 bytes in length.

5.5.2 "Graphic Mode"

"GET_CONFIGURATION" / "SET_CONFIGURATION" commands use a new section called "ID_BMP_MODE". This section will configure / activate the "Graphic Mode".

5.6 INITIALIZATION FUNCTIONS DESCRIPTIONS

5.6.1 DEFAULT_INIT ID=0x0A

This function allows initializing the MorphoAccess™ with the default configuration.

5.6.1.1 REQUEST

Identifier value	0x0A	
Length value	0x0000 or 0x0001	
Value(Parameters)	Keep net settings	1 byte

Keep net settings:

This optional Boolean parameter prevents network setting from being reset (FALSE: the network parameters are reset, TRUE: the network parameters are not modified).

5.6.1.2 REPLY

Identifier value	0x0A	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_CMD_INPROGRESS	A command is already in progress
ILVERR_BADPARAMETER	Input parameters are not valid
ILVERR_ERROR	An error occurred during the execution of the function.

Note:

If the request status is ILV_OK, the MorphoAccess™ terminal is configured with the default values:

- ◆ ID_COM1 and ID_COM2
 - Baudrate 9600 bauds
 - Data bits 7 bits
 - Parity Even
 - Stop bits 2 bits
 - Flow Control no
 - Send (COM1/COM2) no
 - Format 0 (ASCII format)
- ◆ Net Configuration
 - Ip Address 134.1.32.214
 - SubNet 255.255.0.0
 - Default Gateway 134.1.6.20
- ◆ Relay
 - Relay disabled
 - Timeout 3000 ms
- ◆ Wiegand/DataClock out
 - Format 0 (ASCII format)
 - Send no
- ◆ Wiegand/DataClock options
 - facility code 7 (used to discriminate Wiegand ID)

▪ dataclock levels	0 (normal data normal strobe)
▪ led in	0 (MorphoAccess™ led is not driven by card reader)
▪ led out/card present	0 (Led signal is not forced)
◆ Language	
▪ Default	0 (english)
◆ Morpho Access application	
▪ Mode	unchanged
▪ Host Com	3 (Ethernet)
▪ Log file	1 (log enabled)
▪ Admin ident	unchanged
▪ Time mask	0 (Time zone feature is disabled)
◆ Graphical User Interface	
▪ Change language	0 (no language change allowed)
▪ Display hour	0 (clock is not displayed)
▪ Welcome field 1	1 (only User ID is shown on positive identification...)
▪ Welcome field 2	0 (...and nothing else)
▪ Idle time	0 (no sleep mode)
◆ Contactless option	
▪ Reader type	0 (option disabled)
▪ B, N, C	0 (option disabled)
▪ Without DB mode	2 (contactless authentication with minutiae)
◆ Time Attendance	
▪ mode	0 (option disabled)
▪ display	3 (graphical mode)
◆ Special IDs	
▪ Send failure ID	0 (option disabled)
▪ No match ID	65535
▪ Not on time ID	65535
▪ Timeout ID	65535
▪ Not in DB ID	65535
▪ Error ID	65535
◆ Anybit Wiegand	
▪ Length	26 bits
◆ Graphic Mode	
▪ Enable	0 (disabled)
▪ File	0 ("picto0.bin")

To validate the new values, it is necessary to reboot the terminal. The REBOOT command can be used.

5.6.2 GET_VERSION ID=0x03

This function returns the serial number of the terminal, the revision of the software application and the MorphoAccess™ type.

5.6.2.1 REQUEST

Identifier value	0x03
Length value	0x0000
Value(Parameters)	None

5.6.2.2 REPLY

Identifier value	0x03
Length value	0x0011
Value(Parameters)	Request Status 1 byte
	Serial Number 9 bytes
	Software Revision 4 bytes
	Extended Memory 1 byte
	MorphoAccess™ Type 2 byte

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_CMD_INPROGRESS	A command is already in progress
ILVERR_BADPARAMETER	Input parameters are not valid
ILVERR_ERROR	An error occurred during the execution of the function.

Serial Number: Serial Number of the MorphoAccess™. The output buffer is a string of ASCII characters.

Software Revision: The software revision is formatted as below

b6	b5	b4	b3	b2	b1	b0	b7	1 byte	1 byte	1 byte(LSB)
R	R	R	R	R	R	R	R	R	Major revision	Minor revision

Storage Memory: This command gives the size of the flash memory, in megabytes. This size is variable, according to the MorphoAccess™ type.

MorphoAccess™ Type: To get the MorphoAccess™ type (MA200, MA300, MA22x). The output value is 200, 220 or 300. This value is sent in big endian encoding.

5.6.3 REBOOT ID=0x04

This function allows rebooting the MorphoAccess™ in order to initialize the application. For example, after changing net parameters it is necessary to reboot the system.

5.6.3.1 REQUEST

Identifier value	0x04
Length value	0x0000
Value(Parameters)	None

5.6.3.2 REPLY

Identifier value	0x04
Length value	0x0001
Value(Parameters)	Request Status 1 byte

Request Status:

ILVERR_CMD_INPROGRESS	A command is already in progress
ILVERR_BADPARAMETER	Input parameters are not valid

Notes:

If the reboot command is successful, the system cannot send a reply ILV since it is rebooting.

5.6.4 PING ID=0x08

This function allows checking that the terminal responds correctly.

5.6.4.1 REQUEST

Identifier value	0x08
Length value	0x0000
Value(Parameters)	None

5.6.4.2 REPLY

Identifier value	0x08	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Request Status:

ILV_OK	The terminal answered.
ILVERR_CMD_INPROGRESS	A command is already in progress
ILVERR_BADPARAMETER	Input parameters are not valid

5.7 CONFIGURATION FUNCTIONS DESCRIPTIONS

5.7.1 SET_CONFIGURATION ID=0x01

This function initializes the module using custom parameters.

5.7.1.1 REQUEST

Identifier value	0x01																														
Length value	0x0001 + <L _s > + <L _w > + <L _t > + <L _r > + <L _d > + <L _o > + <L _m > + <L _G > + <L _L > + <L _C > + <L _{BMP} >																														
Value(Parameters)	<table border="0"> <tr> <td>MorphoAccess™ Mode</td> <td>1 byte</td> </tr> <tr> <td>Serial Link Configuration</td> <td>L_s bytes</td> </tr> <tr> <td>Wiegand/DataClock Configuration</td> <td>L_w bytes</td> </tr> <tr> <td>Network Configuration</td> <td>L_t bytes</td> </tr> <tr> <td>Relay Configuration</td> <td>L_r bytes</td> </tr> <tr> <td>Date and Time Configuration</td> <td>L_d bytes</td> </tr> <tr> <td>Wiegand/DataClock Options</td> <td>L_o bytes</td> </tr> <tr> <td>MorphoAccess™ Application</td> <td>L_m bytes</td> </tr> <tr> <td>Graphical User Interface Parameters</td> <td>L_G bytes</td> </tr> <tr> <td>Language Parameters</td> <td>L_L bytes</td> </tr> <tr> <td>Contactless Parameters</td> <td>L_C bytes</td> </tr> <tr> <td>Wiegand Anybit Parameters</td> <td>L_{WA}</td> </tr> <tr> <td>Failure ID Parameters</td> <td>L_{ID} bytes</td> </tr> <tr> <td>Time Attendance Parameters</td> <td>2 bytes</td> </tr> <tr> <td>Graphic Mode Parameters</td> <td>L_{BMP} bytes</td> </tr> </table>	MorphoAccess™ Mode	1 byte	Serial Link Configuration	L _s bytes	Wiegand/DataClock Configuration	L _w bytes	Network Configuration	L _t bytes	Relay Configuration	L _r bytes	Date and Time Configuration	L _d bytes	Wiegand/DataClock Options	L _o bytes	MorphoAccess™ Application	L _m bytes	Graphical User Interface Parameters	L _G bytes	Language Parameters	L _L bytes	Contactless Parameters	L _C bytes	Wiegand Anybit Parameters	L _{WA}	Failure ID Parameters	L _{ID} bytes	Time Attendance Parameters	2 bytes	Graphic Mode Parameters	L _{BMP} bytes
MorphoAccess™ Mode	1 byte																														
Serial Link Configuration	L _s bytes																														
Wiegand/DataClock Configuration	L _w bytes																														
Network Configuration	L _t bytes																														
Relay Configuration	L _r bytes																														
Date and Time Configuration	L _d bytes																														
Wiegand/DataClock Options	L _o bytes																														
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Graphical User Interface Parameters	L _G bytes																														
Language Parameters	L _L bytes																														
Contactless Parameters	L _C bytes																														
Wiegand Anybit Parameters	L _{WA}																														
Failure ID Parameters	L _{ID} bytes																														
Time Attendance Parameters	2 bytes																														
Graphic Mode Parameters	L _{BMP} bytes																														

MorphoAccess™ Mode:

It is not available, set to 0. This parameter is mandatory.

Serial Link Configuration:

This packet configures the serial link.

Identifier value	ID_COM1 or ID_COM2														
Length value	0x0007														
Value	<table border="0"> <tr> <td>Speed</td> <td>1 byte</td> </tr> <tr> <td>Databits</td> <td>1 byte</td> </tr> <tr> <td>Stop bits</td> <td>1 byte</td> </tr> <tr> <td>Parity</td> <td>1 byte</td> </tr> <tr> <td>Flow control</td> <td>1 byte</td> </tr> <tr> <td>Send</td> <td>1 byte</td> </tr> <tr> <td>Format</td> <td>1 byte</td> </tr> </table>	Speed	1 byte	Databits	1 byte	Stop bits	1 byte	Parity	1 byte	Flow control	1 byte	Send	1 byte	Format	1 byte
Speed	1 byte														
Databits	1 byte														
Stop bits	1 byte														
Parity	1 byte														
Flow control	1 byte														
Send	1 byte														
Format	1 byte														

Notes:

- See the corresponding table for the serial parameters at the end of the document.
- You can define up to two ILV packets for serial link configuration using ID_COM1 and ID_COM2

Wiegand/DataClock Configuration:

This packet enables or disables the output Wiegand/DataClock. You can specify the output format of the ID.

Identifier value	ID_WIEGAND or ID_DATACLOCK	
Length value	0x0002	
Value	Format	1 byte
	Send	1 byte

Send : To activate/deactivate the output port

Format : It is not available, set to 0. This parameter is mandatory.

Notes:

- Using Wiegand, ID is sent in binary format.
- Using Dataclock, ID is sent in BCD format.
- For historical reasons, you can define two ILV packets using ID_WIEGAND and ID_DATACLOCK but configuring one or another as the same effect.

Network Configuration:

This packet configures the Ip adress of the terminal.

Identifier value	ID_TCPIP	
Length value	0x0000 + <L>	
Value	Ip address	8..16 bytes
	Subnet	8..16 bytes
	Ip address Gateway	8..16 bytes

Ip address : The Ip address of the MorphoAccess™ (use for the TCP/IP connect)

Subnet : The mask of the subnet¹

Ip address Gateway : The Ip address to the gateway.

Notes:

- To validate the new values it is necessary to reboot the terminal. The REBOOT ILV command may be used.
- The three parameters are ASCII null terminated strings. The format of the IP address is aaa.bbb.ccc.ddd.
- The default Ip address is 134.1.32.214

Relay Configuration:

This packet activates or deactivates the relay.

Identifier value	ID_RELAY	
Length value	0x0002	
Value	Relay mode	1 byte
	Timeout activate	1 byte

Relay mode : Activate/ Deactivate the relay of the MorphoAccess™².

Timeout activate : To configure the release time of the relay.

Notes:

¹ Contact your network administrator for the values.

² See the Terminal block board in Installation guide document.

- See the corresponding table of the relay parameters at the end of the document.

Date and Time Configuration:

This packet configures the time and the date of the system.

Identifier value	ID_DATE
Length value	0x000D
Value	Time/Date system 13 bytes

Time/Date system : A string of ASCII characters with **Day**, **Month**, **Years**, **Hours**, **minutes** and **Seconds** each encoded with 2 bytes: "DDMMYYHHmmSS". For example the string "010601120000" indicates the 06/01/01 at 12:00:00 clock.

Notes:

- The string is null terminated.

Wiegand/DataClock Options :

This packet configures additional parameters of the Wiegand/DataClock.

Important remark : "Facility Code" may be a 32 bits value. In the way to be compliant with length two structures are accepted.

The historical one :

Identifier value	ID_WIEGAND_OPTION
Length value	0x0004
Value	Facility Code 1 byte
	Dataclock Levels 1 byte
	Led In 1 byte
	Led Out / Card Present 1 byte

The "extended one" :

Identifier value	ID_WIEGAND_OPTION
Length value	0x0007
Value	Facility Code 4 byte
	Dataclock Levels 1 byte
	Led In 1 byte
	Led Out / Card Present 1 byte

The "length" field allows to differentiate both structures.

- | | |
|--------------------------|--|
| Facility Code : | ▪ 0-4294967295. Used to differentiate Wiegand ID |
| Dataclock Levels : | ▪ 0 Data and strobe are not inverted. |
| | ▪ 1 Strobe is inverted. |
| | ▪ 2 Data is inverted. |
| | ▪ 3 Data and strobe are inverted. |
| Led In : | ▪ 0 The led signal is ignored. |
| | ▪ 1 Led is driven by led signal. |
| Led Out / Card Present : | ▪ 0 Card Present signal in Dataclock mode. |
| | ▪ 0 Led Out signal in Wiegand mode. |
| | ▪ 1 Signal is forced to led out. |

Morpho Access Application:

This packet configures parameters of the application.

Identifier value	ID_APPLI_OPTION	
Length value	0x0005	
Value	Host Com	1 byte
	Mode	1 byte
	Log File	1 byte
	Admin identification	1 byte
	Time mask	1 byte

- Host Com :
- 0 for “Stand Alone” mode.
 - 1 selects the first serial link (COM1).
 - 2 selects the second serial link (COM2).
 - 3 selects the Ethernet port.
- Mode :
- 0 for Identification mode.
 - 1 for Authentication mode.
 - 2 for Proxy mode.
 - 3 for Contactless Authentication without database mode.
 - 4 for Contactless Authentication with database mode.
 - 5 for Merged mode (merge between mode 0 and mode 3).
 - 6 for Authentication mode with a keyboard ID
- Log File :
- 0 disables logs file.
 - 1 enables logs file.
- Admin identification
- 0 disables biometric administrator identification.
 - 1 enables biometric administrator identification.
- Time mask
- 0 disables time zone feature.
 - 1 enables time zone feature.

Notes :

- To validate the new values it is necessary to reboot the terminal. The REBOOT ILV command may be used.

Graphical user interface configuration:

This packet configures graphical user interface parameters.

Identifier value	ID_GUI	
Length value	0x0005	
Value	Change language	1 byte
	Display hour	1 byte
	Welcome field 1	1 byte
	Welcome field 2	1 byte
	Idle time	1 byte

- Change language:
- 0 the user can't change the language.
 - 1 the user is allowed to change the language.
- Display hour:
- 0 disables clock display.
 - 1 enables clock display.
- Welcome field 1:
- 0 – 9 user first additional field to be displayed when identified.
- Welcome field 2:
- 0 – 9 user second additional field to be displayed when identified.
- Idle Time
- Time in minutes after which MorphoAccess™ enters sleep mode.

Notes :

- To validate the new values it is necessary to reboot the terminal. The REBOOT ILV command can be used.

Language Parameters:

This packet allows to parameter the language service.

Identifier value	ID_LANGUAGE	
Length value	0x0001	
Value	Default language	1 byte

- Default language:
- 0 for English.
 - 1 for Spanish.
 - 2 for French.
 - 3 for German
 - 4 for Italian
 - 5 for language5
 - 6 for language6
 - 7 for language7
 - 8 for language8
 - 9 for User defined Language

Warning : In the MorphoAccess 5.41 the User defined language is the number 9, instead of 3 in previous versions.

Contactless Parameters:

This packet allows to parameter the contactless option.

Identifier value	ID_CONTACTLESS	
Length value	0x0004 or 0x0005	
Value	Reader type	1 byte
	B	1 byte
	N	1 byte
	C	1 byte
	Without DB mode	1 byte (optional, if not present value in CFG unchanged)

- Reader type:
- 0 disables contactless card reader connection.
 - 1 enables Deister contactless card reader connection.
- B:
- starting bloc of SAGEM data.
- N:
- number of bloc used by SAGEM data.
- C:
- 1 enables use of MIFARE key set A
 - 2 enables use of MIFARE key set B
- Without DB mode
- 0 for card chosen mode
 - 1 for ID only mode
 - 2 for templates or BIOPIN mode
 - 16 for PIN mode
 - 18 for PIN then templates or BIOPIN mode

Anybit Wiegand Parameters:

This packet configures anybit wiegand parameters.

Identifier value	ID_WIEGAND_ANYBIT	
Length value	0x001A	
Value	Output Length	2 bytes
	Output Direction	1 byte
	Output Start Type	1 byte
	Output Start Range	1 byte
	Output Stop Type	1 byte
	Output Stop Range	1 byte
	Output Site Offset	1 byte
	Output Site Size	1 byte
	Output ID Offset	1 byte
	Output ID Size	1 byte
	Output Custom Offset	1 byte
	Output Custom Size	1 byte
	Input Length	2 bytes
	Input Direction	1 byte
	Input Start Type	1 byte
	Input Start Range	1 byte
	Input Stop Type	1 byte
	Input Stop Range	1 byte
	Input Site Offset	1 byte
	Input Site Size	1 byte
Input ID Offset	1 byte	
Input ID Size	1 byte	
Input Custom Offset	1 byte	
Input Custom Size	1 byte	

- | | |
|-------------------|--|
| Length: | ▪ Defines the number of bits of the frame. |
| Direction | ▪ Always reverse (0) |
| Start/Stop Type: | ▪ 0 resets control bit to 0. |
| | ▪ 1 sets control bit to 1. |
| | ▪ 2 sets an even parity |
| | ▪ 3 sets an odd parity. |
| | ▪ 4 suppresses control bit. |
| Start/Stop Range: | ▪ Defines the number of bits over which the parity is calculated. |
| Data Offset: | ▪ Indicates where a data (site, ID or Custom) is inserted in the frame. |
| Data Size: | ▪ Indicates the number of bits of data (site, ID or Custom) which are inserted in the frame. |

Notes :

- To validate the new values it is necessary to reboot the terminal. The REBOOT ILV command can be used.

Failure ID Parameters:

This packet defines ID values to send to the Wiegand/Dataclock controller when biometric errors occur.

Identifier value	ID_SPEC_ID	
Length value	0x000B	
Value	Send Failure ID	1 byte
	ID not recognized	2 bytes
	ID not in database	2 bytes
	ID not on time	2 bytes
	Timeout	2 bytes
	Generic Error	2 bytes

- Send Failure ID:
- 0 : Don't send failure ID to the controller when biometric errors occur
 - 1 : Send failure ID to the controller when biometric errors occur
- ID not recognized: A value between 0 and 65535 (65535 by default) sent to the controller when a user is not identified (i.e. a biometric operation has failed)
- ID not in database: A value between 0 and 65535 (65535 by default) sent to the controller when no record can be found in the database for the specified user id (i.e. no biometric operation can be performed).
- ID not on time: A value between 0 and 65535 (65535 by default) sent to the controller when the identified user is not authorized to access at the current time.
- Timeout: A value between 0 and 65535 (65535 by default) sent to the controller when the identification/authentication operation aborts due to a timeout error.
- Generic Error: A value between 0 and 65535 (65535 by default) sent to the controller when any other biometric error occurs.

All parameters are mandatory.

Time Attendance Parameters:

This packet allows to enable/disable the Time Attendance mode, and to configure the language for the menus associated to this mode.

Identifier value	ID_TIME_ATTENDANCE	
Length value	0x02	
Value	Mode	1 byte
	Display/Language	1 byte

- Mode:
- 0 : TA disabled
 - 1 : TA enabled with 2 functions (see MorphoAccess™ Installation Guide)
 - 2 : TA enabled with 4 functions (see MorphoAccess™ Installation Guide)
- Display/Language
- 0 : keys label in English
 - 1 : keys label in Spanish
 - 2 : keys label in French
 - 3 : graphic mode

“Graphic Mode” configuration:

This packet allows to activate the “Graphic Mode” and to select the corresponding file.

Identifier value	ID_BMP_MODE
Length value	0x0004

Value	Enabled	1 byte
	File ID	1 byte
	RFU	1 byte
	RFU	1 byte

- Enabled:
- 0 : the standard mode is activated (text and bitmap)
 - 1 : the terminal will use a personalized file to manage visual information.
- File ID
- 0 use picto0.bin
 - 1 use picto1.bin
 - 2 use picto2.bin

The “Graphic Mode Tutorial.html” documentation will give you a complete description about this mode.

Remarks:

- Include only the required section (ID_COM1, ID_COM2, ID_TIME_ATTENDANCE, and ID_BMP_MODE are optional).
- All this parameters are described in configuration table see chapter 5.26.
- To validate the new values it is necessary to reboot the terminal. The REBOOT can be used.

5.7.1.2REPLY

Identifier value	0x01	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR_SL	An error occurred during the execution of Serial Link Configuration.
ILVERR_ERROR_WIEGAND	An error occurred during the execution of Wiegand/Dataclock Configuration.
ILVERR_ERROR_NETWORK	An error occurred during the execution of TCP/IP Configuration.
ILVERR_BADPARAMETER	One of the parameter of the request is incorrect.
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_ERROR	An error occurred during the execution of the function.

5.7.2 GET_CONFIGURATION ID=0x06

This function retrieves the system configuration.

5.7.2.1 REQUEST

Identifier value	0x06
Length value	0x0000 + <i>
Value(Parameters)	Parameter Identifier 1 Parameter Identifier 2 Parameter Identifier i

Parameter Identifier:

It is used to determine which parameter will be returned. It must be a list identifier like ID_COM1, ID_COM2, ID_WIEGAND, ID_DATACLOCK, ID_RELAY, ID_TCPIP, ID_DATE, ID_WIEGAND_OPTION, ID_APPLI_OPTION, ID_GUI, ID_LANGUAGE, ID_WIEGAND_ANYBIT, ID_SPEC_ID, ID_TIME_ATTENDANCE, ID_BMP_MODE.

5.7.2.2 REPLY

Identifier value	0x06
Length value	0x0002 + <L _s > + <L _w > + <L _t > + <L _r > + <L _d > + <L _o > + <L _m > + <L _G > + <L _L > + <L _C >
Value(Parameters)	Request Status 1 byte MorphoAccess™ Mode 1 byte Serial Link Configuration L _s bytes Wiegand/DataClock Configuration L _w bytes Network Configuration L _t bytes Relay Configuration L _r bytes Date and Time Configuration L _d bytes Wiegand/DataClock Options L _o bytes Mopho Access Application L _m bytes Graphical user interface parameters L _G bytes Language Parameters L _L bytes Contactless Parameters L _C bytes Wiegand Anybit Parameters L _{WA} bytes Failure ID Parameters L _{ID} bytes Time Attencance Parameters 2 bytes Graphic Mode Parameters L _{BMP} bytes

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_CMD_INPROGRESS	Another command is already in progress

MorphoAccess™ Mode :

It is not available. Set to 0.

Notes :

- See the request SET_CONFIGURATION command to get the details of ILV packet, Serial Link configuration, Network configuration, Relay configuration, Date/Time configuration, Application

configuration, Graphical user interface configuration, Language configuration and Contactless configuration.

5.8 SECURITY CONFIGURATION

These parameters allow to configure some aspects of security. For the moment it is a way to make a DSA signature checking on an authentication command.

5.8.1 SET_PUBLIC_KEY ID=0x53

5.8.1.1 REQUEST

Identifier value	0x53	
Length value	0x0001+0x0194	
Value(Parameters)	Management of a signature for Pk	1 byte
	Public Key	128 bytes
	Parameter p	128 bytes
	Parameter q	20 bytes
	Parameter g	128 bytes

Management of the signature:

Thanks to this parameter a verification of the signature of the Pk sent by the host or read in a contactless card is performed.

0x00	The verification of Pk by a signature is not performed
0x01	A verification of Pk is performed using a signature

The default value is 0x00. If this utility is activated, a signature must be sent in the same packet. These parameters have to be initialized every time the MorphoAccess™ reboots.

Public Key:

If the management of the signature is on, a public key has to be sent byte per byte from the least significant byte to the most significant one.

Parameters p,q,g:

As for the public key, these parameters have to be sent when a management of signature is performed (from the least significant byte to the most significant one).

5.8.1.2REPLY

Identifier value	0x53	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

If the function does not succeed, the MorphoAccess™ is configured with default values.

Request Status:

ILV_OK	The function completed successfully
ILVERR_BADPARAMETER	Bad input parameters
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_SECURITY_MODE	Key could not be changed (secure mode activated)

Notes:

When the Deister contactless card reader option is not activated on the MorphoAccess™ terminal, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

5.9 BIOMETRICS FUNCTIONS DESCRIPTION

5.9.1 VERIFY ID=0x20

This function captures a finger and checks if it matches with the minutiae file sent to the terminal.
[This function was previously called AUTHENTICATE].

5.9.1.1 REQUEST

Identifier value	0x20	
Length value	0x0005 + <L1+3> + <L2+3> + <L+3>	
Value (Parameters)	Timeout	2 bytes
	Matching threshold	2 bytes
	Acquisition quality threshold	1 byte
	Biometrics Data 1	L1+3 bytes
	Biometrics Data 2	L2+3 bytes
	User ID	L+3 bytes

Timeout:

Finger detection timeout in seconds. Its value must be between 0 and 30.
A value of 0 corresponds to an infinite timeout.

Matching Threshold:

This parameter can be set to values from 0 to 10. This parameter specifies how tight the matching threshold is. Threshold scoring values are identified below:

0	Low threshold for test purpose only.	There are few rejections, but many recognitions.
1	Very few persons rejected.	Tolerant application.
...		
5	Intermediate threshold.	Intermediate.
...		
9	Very high threshold (few false acceptances).	Secure Application.
10	High threshold for test purpose only.	There are very few recognition, many rejections.

Acquisition Quality Threshold:

Not used in MorphoAccess™. Set to 0.

Biometric data first finger or database record: One of the following ILV:

- ILV formatted data containing the reference minutiae of the first finger.

Identifier value	ID_PKCOMP or ID_PKMAT	
Length value	< L >	
Value (Parameters)	Minutiae	L bytes

Identifier :

- If the identifier is ID_PK_MAT, the minutiae buffer must be 512 chars.
- If the identifier is ID_PK_COMP, size of minutiae buffer should be between 170 and 256.

- ILV formatted data containing the database identifier and the record identifier to match with.

Identifier value	ID_PKBASE	
Length value	<L + 1>	
Value (Parameters)	Database identifier	1 byte
	User ID or User Index	L bytes

User ID: ILV formatted data that contains the USER ID.

Identifier value	ID_USER_ID	
Length value	0x0000 + <X>	
Value	Value	X bytes

User Index: ILV formatted data that contains the User Index.

Identifier value	ID_USER_INDEX	
Length value	0x0004	
Value	Index	4 bytes

Biometric data second finger (optional): ILV formatted data containing the reference minutiae of the second finger. This parameter must not be used if matching against a database record. ID_PKCOMP should be used. Other formats are reserved for compatibility with existing systems or specific usage. The maximum PK size is 256 bytes.

Identifier value	ID_PKCOMP or ID_PKMAT	
Length value	<L>	
Value (Parameters)	Minutiae	L bytes

User ID:

One ILV formatted data containing personal user data or other information. This field can be used to create log files or display information during users authentication. It has a size of 19 bytes maximum. The Identifier must be ID_USER_ID.

Identifier value	ID_USER_ID	
Length value	0x0000 + <L>	
Value (Parameters)	User data	L bytes

- Note: If the ILV "Biometric data first finger or database record " contains the database identifier and the record identifier to match with, you don't have to define User ID User data

5.9.1.2 REPLY

Identifier value	0x20	
Length value	0x0002	
Value (Parameters)	Request status	1 byte
	Matching result	1 byte

Request status:

ILV_OK	The function succeeded.
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	The matching threshold value, or timeout value are not in the range, or there is no input biometric data, or first finger is ID_PKBASE and second finger is present.
ILVERR_INVALID_MINUTIAE	The reference ILV minutiae is not valid: bad identifier, corrupted minutiae.
ILVERR_TIMEOUT	The finger detection timeout has expired.
ILVERR_CMD_INPROGRESS	Another command is already in progress.
ILVERR_ADMIN_EXECUTING	In mode administrator.
ILVERR_BIO_INPROGRESS	An identification or an authentication is processing, retry later.

Matching result:

ILVSTS_HIT	The comparison succeeded.
ILVSTS_NO_HIT	It is not the same finger.
ILVSTS_LATENT	The system detected a latent fingerprint in the input fingerprint.

5.9.2 ENROLL ID=0x21

This function captures and enrolls a live finger. Number of fingers and type of enrollment can be specified. The calculated minutiae can be also exported to the host.

5.9.2.1 REQUEST

Identifier value	0x21	
Length value	0x0008 + <L+3> + <L1+3> + ... <Li+3>	
Value (Parameters)	Database identifier	1 byte
	Timeout	2 bytes
	Acquisition quality threshold	1 byte
	Enrollment type	1 byte
	Number of fingers	1 byte
	Save record	1 byte
	Export minutiae	1 byte
	User ID	L+3 bytes
	Additional user data field 1	L1+3 bytes
	...	
	Additional user data field i	Li+3 bytes

Database identifier :

It will be used if the Terminal contains several local bases. This is the same identifier than in the *CREATE DATABASE* command. With MA300, this value must be between 0 and 15. If *Save record* field in the request is set to FALSE this value is ignored.

Timeout:

Finger detection timeout in seconds. Its value must be between 0 and 30. A value of 0 corresponds to an infinite timeout.

Acquisition Quality Threshold:

Not used in MorphoAccess™. Set to 0.

Enrollment type:

It defines the number of acquisitions per finger.

- Set this value to 0x00 for default enrollment; the minutiae are calculated from two finger-prints acquisition.
- Set this value to 0x01 for simple enrollment; the minutiae are calculated from one finger-print acquisition.

Number of fingers:

The number of finger to enroll. This function can enroll 1 or 2 fingers.

- Set this value to 0x01 to enroll 1 finger per user.
- Set this value to 0x02 to enroll 2 fingers per user.

Save Record:

Set this Boolean to TRUE to store calculated minutiae into the local database. Otherwise set it to FALSE.

Export Minutiae:

Defines the format of the exported minutiae.

- Setting this value to 0x00 will not include the calculated minutiae in the reply.
- Setting this value to 0x01 to export the minutiae in the default format (compressed minutiae). In this case the PK buffer is 256 char compressed PKs. The corresponding identifier is PK_COMP.
- Other values ranged in [0xAA, 0xFF] define the size of the returned compressed minutiae. For example PK_COMP_175 (0xAF) corresponds to a 175 bytes returned PK. Authorised value are PK_COMP_170 to PK_COMP_255.

User ID:

One ILV formatted data containing personal user data to be saved into the database if the Save Record value is set to TRUE. Those data can be retrieved by the IDENTIFY function under Hit condition.

The Identifier must be ID_USER_ID.

The maximum size for the user ID is 24 bytes.

Identifier value	ID_USER_ID	
Length value	0x0000 + <L>	
Value (Parameters)	User data	L bytes (<25 bytes)

Additional User Data field j:**Identifier:**

- ID_PUC_DATA (If value is a string),
- ID_C_DATA (for a character),
- ID_L_DATA for a long,
- ID_S_DATA for a short.

All the additional user data fields defined in the *CREATE DATABASE* command have to be set in the *ENROLL* command.

Identifier value	ID_PUC_DATA or ID_C_DATA or ID_L_DATA or ID_S_DATA.	
Length value	0x0000 + <Lj>	
Value (Parameters)	User data	Lj bytes

Notes about additional fields:

- Size and order of additional data fields must be consistent with database structure.
- The *CREATE DATABASE* function, described in section 5-47 provides more information about additional fields.

5.9.2.2 REPLY

Identifier value	0x21	
Length value	0x0006 + <L1+3> + <L2+3>	
Value (Parameters)	Request status	1 byte
	Enroll status	1 byte
	User database index	4 bytes
	Biometrics Data 1	L1+3 bytes
	Biometrics Data 2	L2+3 bytes

Request status:

ILV_OK	The execution of the function succeeded.
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	One or more input parameters are out of range.
ILVERR_INVALID_USER_DATA	The input ILV user data is not valid: bad identifier or wrong size.
ILVERR_TIMEOUT	The finger detection timeout has expired.
ILVERR_CMD_INPROGRESS	Another command is already in progress.
ILVERR_BIO_INPROGRESS	An identification or an authenticate is processing.
ILVERR_BASE_NOT_FOUND	The specified base does not exist.

Enroll status:

ILVSTS_OK	The enrollment succeeded.
ILVSTS_DB_FULL	This status can be returned if the <i>Save Record</i> is TRUE. It means that the maximum number of users that can be stored in the local database has been reached.
ILVERR_BADPARAMETER	One or more input parameters are out of range.

If the *request status* differs from **ILV_OK**, the *enroll status* is not returned.

User database index:

This is the database index of the record (person).

If *Save record* field in the request was set to FALSE the returned value is 0xFFFFFFFF.

If the *request status* differs from **ILV_OK** or the *enroll status* differs from **ILVSTS_OK** the *User database index* is not returned.

Biometrics data:

Identifier value	ID_PK_COMP	
Length value	0x0000 + <L>	
Value (Parameters)	Minutiae	L bytes

The length parameter is equal to the *Export minutiae* value in the request. The range is [0x00AA, 0x0100].

5.9.3 IDENTIFY ID=0x22

This function identifies a live finger against the local database.

5.9.3.1 REQUEST

Identifier value	0x22	
Length value	0x0006	
Value(Parameters)	Database identifier	1 byte
	Timeout	2 bytes
	Matching threshold	2 bytes
	Acquisition Quality Threshold	1 byte

Database identifier:

With MorphoAccess™ 200, it is the same identifier used in the *CREATE DATABASE* command.
With MorphoAccess™ 300, this value can be between 0 and 15.

Timeout:

Finger detection timeout in seconds. Zero value corresponds to an infinite timeout. Maximum finger detection timeout is 30 seconds.

Matching Threshold:

This parameter can be set to values from 0 to 10. This parameter specifies how tight the matching threshold is. Threshold scoring values are identified below. For example:

0	Low threshold for test purpose only	There are few rejections, but many recognitions
1	Very few persons rejected	Tolerant application
...		
5	Intermediate threshold (default value)	Intermediate
...		
9	Very high threshold (few false acceptances)	Secure Application
10	High threshold for test purpose only	There are very few recognitions, and many rejections

Acquisition Quality Threshold:

Not yet used, set to 0.

5.9.3.2 REPLY

Identifier value	0x22	
Length value	0x0006 + <L ₁ >	
Value(Parameters)	Request Status	1 byte
	Matching Result	1 byte
	User Database Index	4 bytes
	User ID	L ₁ bytes

Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	The matching threshold value or timeout value are not in the range
ILVERR_TIMEOUT	The finger detection timeout has expired
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_BIO_INPROGRESS	An Identification or an authenticate is processing, retry later
ILVERR_BASE_NOT_FOUND	The specified base doesn't exist

Matching Result:

This is the result of the identification of the coded fingerprint in the database.

ILVSTS_HIT	The comparison succeeded
ILVSTS_NO_HIT	It is not the same finger
ILVSTS_LATENT	The system detected a latent fingerprint in the input fingerprint.

If the request status differs from ILV_OK, the matching result is not returned.

User Database index:

This is the index database of the record (person). If the request status differs from ILV_OK, or the matching status differs from ILVSTS_HIT, the User Database index is not returned.

User ID:

Identifier value	ID_USER_ID	
Length value	0x0000 + <L>	
Value	User Data field	L bytes

One ILV formatted data containing personal user data saved in the database. The maximum size for the user data is 25 bytes. If the request status differs from ILV_OK, or if the matching status differs from ILVSTS_HIT, the User Data are not returned.

Remark: if the database is empty, the function will stop immediately.

5.10 DATABASE FUNCTIONS DESCRIPTION

5.10.1 Introduction

The MA200 database can store 800 users. A record in the database can take the following status:

- Free: a user can be stored in this record.
- Valid: a user is stored in this record.
- Invalid: the user has been removed with the “remove record” command, but from the database point of view the record is only invalidated. A “garbage collector” command is required to really free the space.

A M300 database can store 3000 users. A record in the database can take the following status:

- Free: a user can be stored in this record.
- Valid: a user is stored in this record.

Contrary to the MA200 a user removed with the “remove record” command is immediately erased.

5.10.2 Example: a MA200 database

5.10.2.1 THE DATABASE CONTAINS 3 RECORDS

Index	Status	Data
1	Valid	Record 1
2	Valid	Record 2
3	Valid	Record 3
4	Free	
5	Free	
...		
799	Free	
800	Free	

Total record :800

Nb records :3

Free records :797

5.10.2.2 A FOURTH RECORD IS ADDED (ADD BASE RECORD)

Index	Status	Data
1	Valid	Record 1
2	Valid	Record 2
3	Valid	Record 3
4	Valid	Record 4
5	Free	
...		
799	Free	
800	Free	

Total record :800

Nb records :4

Free records :796

5.10.2.3 “RECORD 3” IS REMOVED (REMOVE BASE RECORD)

Index	Status	Data
1	Valid	Record 1
2	Valid	Record 2
3	<i>Invalid</i>	<i>Record 3</i>
4	Valid	Record 4
5	Free	
...		
799	Free	
800	Free	

Total record :800

Nb records :3

Free records :796. No space is released.

5.10.2.4 A “GARBAGE COLLECTOR” IS EXECUTED

Index	Status	Data
1	Valid	Record 1
2	Valid	Record 2
3	Free	
4	Valid	Record 4
5	Free	
...		
799	Free	
800	Free	

Total record :800

Nb records :3

Free records :**797**. Space has been released.

5.10.3 CREATE DATABASE ID=0x30

This function creates a biometric database in flash memory.

5.10.3.1 REQUEST

Identifier value	0x30	
Length value	0x0005 + <L1> + <L2> + ... + 	
Value(Parameters)	Database identifier	1 byte
	Flash type	1 byte
	Person NB in database	2 bytes
	Finger number per person	1 byte
	Additional data Field 1	L1 bytes
	Additional data Field 2	L2 bytes
	... Additional data Field i	Li bytes

Database identifier :

Index of the database to create. With MorphoAccess™ 200, it is advised to set this value to 0. With MorphoAccess™ 300, this value can be between 0 and 15.

With MorphoAccess™ 200, in identification mode, the local base used by the MorphoAccess™ is the base with identifier 0.

Flash Type :

Must be set to 0.

Person NB in database :

Maximum NB of person of the database. With MorphoAccess™ 200, this value cannot exceed 800. With MorphoAccess™ 300, this value must be set to 3000.

Finger number per person :

Number of finger per person in the database (1 or 2).

Additional data Field :

Add a new field to an existing base.

Identifier value	ID_FIELD	
Length value	0x0002 + <L>	
Value	Field size	2 bytes
	Field name	L bytes

Field size :

Define the max size (in bytes) of a record. It cannot exceed 128 bytes.

Field name:

String specifying the field name. The size of this string must be less or equal to DDB_MAX_FIELD_NAME_LEN.

Particular fields :

Remark : additional field order creation must be respected as follow :

Additional field 1	Admin field
Additional field 2	Time mask field
Additional field 3	Information to display (typically user name ...)
Additional field 4	...

Both fields 1 and 2 are interpreted by the application. Other fields should be used to display information about an identified user. The G.U.I parameters allow to configure this feature.

Admin field :

To provide biometric administrator login it is possible to specify if a user has administration rights. When creating a database, the **first** created additional field must have the following structure :

Name	Length
ADMIN	3 bytes

When enrolling a user or adding a record, the corresponding additional field must contain « 1 » (i.e. 0x31 0x00 x00) to provide administration rights or « 0 » (i.e. 0x30 0x00 x00) if the user is not an administrator. Please see sections 5-39 and 5-52 for more information about *Enrollment* and *Add Base Record* functions.

Time mask field :

In the way to enable time mask features, the **second** additional field must have the following structure :

Name	Length
TMSK	84 bytes

When enrolling a user or adding a record the corresponding additional field will contain the time mask descriptor. See paragraph « 5.12. *Time mask Functions Description* », section 5-77 for more information about time mask.

Notes :

- You can create only 8 additional fields.
- With MorphoAccess™ 300, the total length of additional fields must not exceed 216 bytes.

5.10.3.2 REPLY

Identifier value	0x30	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BASE_ALREADY_EXISTS	The Database identifier is wrong, this database already exists
ILVERR_NO_SPACE_LEFT	The Database can not be created because there is not enough memory
ILVERR_BADPARAMETER	Wrong number of finger or ILV Format not respected.
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_OUT_OF_FIELD	The number of the additional field is more than 28

ILVERR_FLASH_INVALID
ILVERR_ADMIN_EXECUTING
ILVERR_BIO_INPROGRESS

Flash type invalid
Administrator Mode
An Identification or an authenticate is processing, retry later

5.10.4 ERASE BASE ID=0x32

This function erases all records in a local base of the MorphoAccess™. Base structure is not erased.

5.10.4.1 REQUEST

Identifier value	0x32	
Length value	0x0001	
Value(Parameters)	Database Identifier	1 byte

Database identifier:

With MorphoAccess™ 200, it is the same identifier used in the *CREATE DATABASE* Command.

With MorphoAccess™ 300, this value can be between 0 and 15.

5.10.4.2 REPLY

Identifier value	0x32	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BASE_NOT_FOUND	The specified base doesn't exist
ILVERR_BADPARAMETER	Wrong number of finger or ILV Format not respected.
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_BIO_INPROGRESS	Bio Function is processing, retry later

5.10.5 ERASE ALL BASE ID=0x33

This function deletes all the local bases in flash support.

5.10.5.1 REQUEST

Identifier value	0x33	
Length value	0x0001	
Value(parameters)	Flash type	1 byte

Flash Type :

Must be set to 0.

Notes :

For the moment, only the boot sector flash is available, value 0x00 has to be used.

5.10.5.2 REPLY

Identifier value	0x33	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_FLASH_INVALID	Flash type invalid
ILVERR_BADPARAMETER	Wrong number of finger or ILV Format not respected.
ILVERR_BIO_INPROGRESS	Bio Function is processing, retry later
ILVERR_CMD_INPROGRESS	Another command is already in progress

5.10.6 ADD BASE RECORD ID=0x35

This function adds a record to the local database.(see *example : a MA200 Database 5.10.2.2*)

5.10.6.1 REQUEST

Identifier value	0x35	
Length value	0x0001 + <L ₁ > + .. + <L _i >+ <L>+ <N ₁ >+ ... + <N _k > + <L _T >	
Value(Parameters)	Database identifier	1 byte
	Biometrics Data 1	L ₁ bytes
	...	
	Biometrics Data i	L _i bytes
	User ID	L bytes
	Additional User Data 1	N ₁ bytes
	...	
Additional User Data k	N _k bytes	
Time Stamp	L _T bytes	

Database identifier:

The database Identifier must be the same as the one used with CREATE DATABASE Command.

Biometrics Data:

Data per finger (1 or 2) containing the reference minutiae

Identifier value	ID_PKCOMP	
Length value	0x0000 + <L>	
Value	Minutia	L bytes

Minutiae: The PKs buffer must be 256 char compressed PKs.

User ID:

Identifier value	ID_USER_ID	
Length value	0x0000 + <L>	
Value	ID user	L bytes (<25)

This field contains personal user data saved in the user ID field.

The user ID has a maximal size of 24 bytes.

Additional User Data :

Identifier value	ID_PUC_DATA or ID_C_DATA or ID_L_DATA or ID_S_DATA	
Length value	0x0000 + <L>	
Value	Value	L bytes

Value: Value of Additional User Data k.

Remarks:

- ◆ All the 'Additional User Data field' defined in *CREATE DATABASE* have to be set in the *ADD BASE RECORD* command.
- ◆ The number of fingers per person must be the same as defined by *CREATE DATABASE*.
- ◆ 'User ID' can be retrieved by the *Identify* function under Hit condition.
- ◆ Size and order of additional data fields must be consistent with database structure.

Time Stamp:

Identifier value	ID_TIMESTAMP	
Length value	0x0000 + <L>	
Value	Value	L bytes

One ILV containing a time stamp that will be stored in the database and used to check whether it needs to be updated or not.

Value: it could be a string with **Day**, **Month**, **Years**, **Hours**, **minutes** and **Seconds** each encoded with 2 bytes: "DDMMYYHHmmSS".

This field is necessary.

Notes :

In identification mode, the local base used by the MorphoAccess™ is the base with identifier 0.

5.10.6.2 REPLY

Identifier value	0x35	
Length value	0x0006	
Value(Parameters)	Request Status	1 byte
	Base Status	1 byte
	User Database Index	4 bytes

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	At least one biometric data is required.
ILVERR_INVALID_USER_DATA	The input ILV user data is not valid: bad identifier, wrong size.
ILVERR_INVALID_MINUTIAE	The reference ILV minutiae is not valid: bad identifier, corrupted minutiae.
ILVERR_ALREADY_ENROLLED	The person is already in this database
ILVERR_BIO_INPROGRESS	An Identification or an authenticate is processing, retry later
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_BASE_NOT_FOUND	The specified base doesn't exist

Base Status:

ILVSTS_OK	The enrollment succeeded
ILVSTS_DB_FULL	The maximum number of users that can be stored in the database has been reached.
ILVSTS_LATENT	The system detected a latent fingerprint in the input fingerprint.

User Database Index:

This is the record index of the person.

If the request status differs from ILV_OK, the User Database Index is not returned.

If the base Status is ILVSTS_DB_FULL then the UserDatabase Index is not returned.

5.10.7 REMOVE BASE RECORD ID=0x36

This function removes a record from the local database. (see example : a MA200 Database 5.10.2.3)

5.10.7.1 REQUEST

Identifier value	0x36	
Length value	0x0001 +< L ₁ > + <L _T >	
Value(Parameters)	Database identifier	1 byte
	User ID	L ₁
	Time Stamp	L _T

Database identifier :

With MorphoAccess™ 200, the index of the base used (See *CREATE DATABASE* Command).
With MorphoAccess™ 300, this value can be between 0 and 15.

User ID:

An ILV formatted data that contains the USER ID for the deletion of the record.

Identifier value	ID_USER_ID	
Length value	0x0000 + <L>	
Value	Value	L bytes

Time Stamp:

Identifier value	ID_TIMESTAMP	
Length value	0x0000 + <L>	
Value	Value	L bytes

One ILV containing a time stamp that will be stored in the database and used to check whether it needs to be updated or not.

Value: it could be a string with **Day**, **Month**, **Years**, **Hours**, **minutes** and **Seconds** each encoded with 2 bytes: "DDMMYYHHmmSS".

This field is necessary.

Notes :

With MorphoAccess™ 200, in identification mode, the local base used by the MorphoAccess™ is the base with identifier 0.

5.10.7.2 REPLY

Identifier value	0x36	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	The input ILV Identifier Data is not valid: bad Id, bad length.
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_BASE_NOT_FOUND	The specified base doesn't exist
ILVERR_INVALID_USER_ID	The User ID does not exist in the database

5.10.8 GARBAGE COLLECTOR ID=0x0F

With MorphoAccess™ 200, this function executes a garbage collector in the local Database. (see *example : a MA200 Database 5.10.2.3*)

With MorphoAccess™ 300, this function does not exist.

5.10.8.1 REQUEST

Identifier value	0x0F	
Length value	0x0001	
Value(Parameters)	Database Identifier	1 byte

5.10.8.2 REPLY

Identifier value	0x0F	
Length value	0x0001	
Value(Parameters)	Request Status	1 byte

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BASE_NOT_FOUND	The specified base doesn't exist
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_BADPARAMETER	Wrong number of finger or ILV Format not respected.
ILVERR_BIO_INPROGRESS	An Identification or an authenticate is processing, retry later

Remarks:

- With MorphoAccess™ 200, this function can only be used on the first local base
- Execution time is significant. It has to be executed while local identification is not used.

5.10.9 GET BASE CONFIG ID=0x07

With MorphoAccess™ 200, this function retrieves the configuration of the local database.

With MorphoAccess™ 300, this function retrieves the configuration of one of the 16 local bases (0 to 15).

5.10.9.1 REQUEST

Identifier value	0x07	
Length value	0x0001	
Value(Parameters)	Database Identifier	1 byte

5.10.9.2 REPLY

Identifier value	0x07	
Length value	0x0012 +< L _T >	
Value(Parameters)	Request Status	1 byte
	NB Finger/person	1 byte
	Max record number	4 bytes
	Current Record Number	4 bytes
	Free Record Number	4 bytes
	Fields Number	4 bytes
	ILV Time Stamp	L _T bytes

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BASE_NOT_FOUND	There is no Database corresponding to the Identifier specified in the Request
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_BADPARAMETER	The input ILV Identifier Data is not valid: bad Id, bad length.
ILVERR_BIO_INPROGRESS	An Identification or an authenticate is processing, retry later

NB Finger/person:

Number of fingers saved per person.

Max record number:

Maximum number of records in database

Current Record Number:

Number of records currently saved in Database

Free Record Number:

Number of records currently available in Database

Fields Number:

Number of fields used in Database

Time Stamp:

Indicates when the database was modified for the last time. Id must be:

Identifier value	ID_TIMESTAMP
Length value	0x0000 + <L>
Value	Value L bytes

Value: a string with **Day**, **Month**, **Years**, **Hours**, **minutes** and **Seconds** each encoded with 2 bytes:
“DDMMYYHHmmSS”

Notes :

- Max, Current and Free Record Number are useful to indicate to the host that a GARBAGE_COLLECTOR command is required.

5.10.10 GET ALL BASE CONFIG ID=0x31

This function scans each database and returns the configuration of each created database.

5.10.10.1 REQUEST

Identifier value	0x31
Length value	0x0000

5.10.10.2 REPLY

Identifier value	0x31	
Length value	0x0002 +< L1>+...+< Li>+ ...+< Ln>	
Value(Parameters)	Request Status	1 byte
	Nb Returned Bases	1 byte
	Base 1 configuration	L1 bytes
	...	
	Base i configuration	Li bytes
	...	
	Base n configuration	Ln bytes

Request Status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	Error in ILV request.

If *Request Status* is *ILV_OK* the following fields are returned:

NB Returned Bases:

This number ranged between 0-16 is the number of returned bases.

Base i Configuration:

This ILV is returned for each created base.

Identifier value	ID_BASE_CONF	
Length value	0x0016 + L	
Value(Parameters)	Base Nb	1 byte
	Base Valid	1 byte
	NB Finger/person	1 byte
	Max Record Number	4 bytes
	Current Record Number	4 bytes
	Free Record Number	4 bytes
	Fields Number	4 bytes
	ILV Time Stamp	3+L bytes

Base Nb:

The ID of the returned base configuration. Ranged in 0-15.

Base Valid:

This flag is set to 1 if the base is valid.

NB Finger/person:

Number of fingers saved per person.

Max record number:

Maximum number of records in database

Current Record Number:

Number of records currently saved in Database

Free Record Number:

Number of records currently available in Database

Fields Number:

Number of fields used in Database

Time Stamp:

Indicates when the database was modified for the last time. Id must be:

Identifier value	ID_TIMESTAMP	
Length value	0x0000 + <L>	
Value	Value	L bytes

Value: a string with **Day**, **Month**, **Years**, **Hours**, **minutes** and **Seconds** each encoded with 2 bytes: "DDMMYYHHmmSS"

Notes:

- Max, Current and Free Record Number are useful to indicate to the host that a GARBAGE_COLLECTOR command is required.

5.10.11 DISTANT SESSION ID=0x63

“Distant session” disables the biometric control.

In this mode only a limited set of ILV commands is available and biometrics functions are disabled. It allows sending ILV command without being stopped by the biometrics functions.

Before making an action the following function must be sent with “open session” parameter. At the end, the same function with “close session” parameter must be sent to retrieve biometric functions.

During a distant session only a limited set of ILV commands is available. Please check “05

Commands not authorized during a distant session.” Paragraph for a complete list of these commands.

5.10.11.1 REQUEST (TO OPEN A DISTANT SESSION)

Identifier value	0x63	
Length value	0x0001	
Value(Parameters)	Session parameter	1 byte

Session parameter:

ID_OPEN_DISTANT_SESSION	Opens a distant session in the way to allow biometric database download.
--------------------------------	--

5.10.11.2 REPLY (WHILE OPENING A DISTANT SESSION)

Identifier value	0x63	
Length value	0x0002	
Value(Parameters)	Request Status	1 byte
	Session status	1 byte

Request Status:

ILV_OK	The execution of the function succeeded.
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	Error in ILV request.

If “Request Status” is *ILV_OK* the following field is returned:

Session status:

This field specifies the session state.

DISTANT_SESSION_OPENED	Session successfully opened.
DISTANT_SESSION_MEMORY_ERROR	Not enough resources to provide database download.
DISTANT_SESSION_ALREADY_OPENED	The session is not opened. A distant session is already opened.

5.10.11.3 REQUEST (TO CLOSE A DISTANT SESSION)

Identifier value	0x63	
Length value	0x0001	
Value(Parameters)	Session parameter	1 byte

Session parameter:

ID_CLOSE_DISTANT_SESSION The following command switches back the terminal to its normal mode after a base download.

While a terminal is in an emergency state, the host must not send a Distant Session Close frame. It could make the terminal leaving the emergency state and closing the access.

5.10.11.4 REPLY (WHILE CLOSING A DISTANT SESSION)

Identifier value	0x63	
Length value	0x0002	
Value(Parameters)	Request Status	1 byte
	Session status	1 byte

Request Status:

ILV_OK The execution of the function succeeded.
ILVERR_ERROR An error occurred during the execution of the function.
ILVERR_BADPARAMETER Error in ILV request.

If the function succeeded biometric functions are enabled again.

If “Request Status” is *ILV_OK* the following field is returned:

Session status:

This field specifies the session state.

DISTANT_SESSION_CLOSED Session successfully closed. The terminal is working in “normal” mode.
DISTANT_SESSION_ALREADY_CLOSED No distant session previously opened.

5.11 LOG MANAGEMENT FUNCTIONS DESCRIPTIONS (V1.1)

The MorphoAccess™ terminal is able to log all its biometric activities. This function can be used to get information about quality of enrollment, authentications or identifications and also for time and attendance purposes.

Logged Information is:

- Event date and time.
- Type of event (enrollment, identification, authentication).
- ID of the person concerned by the event.
- Biometric information (minutiae quality or matching score).

A log occupies 64 bytes. It is possible to log 3840 events.

5.11.1 GET LOG STATUS ID=0x5D

This function returns the state of the log data.

5.11.1.1 REQUEST

Identifier value	0x5D	
Length value	0x0001	
Value(Parameters)	Log Base Id	1 byte

Log Base Id:

Defines the number of the base. In V1.1 this parameter is mandatory but ignored.

5.11.1.2 REPLY

Identifier value	0x5D	
Length value	0x000A	
Value (Parameters)	Request status	1 byte
	Log Enabled	1 byte
	Current Line	2 bytes
	Number of Lines	2 bytes
	Line Size	2 bytes
	Base State	1 byte
	Version	1 byte

Request status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	Input parameters error.

Log Enabled :

Reflects the configuration. 1 if log are enabled, 0 if they are disabled.

Current Line :

The current free line in the base.

Number of Lines :

The total number of line in the base.

Line Size :

The size of a line.

Base State :

0x01 if base is valid. 0xFF if it's full.

Version :

The current version of the log service.

Notes: The 4 most significant bits are coding the version number. The 4 least significant bits are

coding the revision number. Version 1.1 is encoded as 0x11.

5.11.2 GET LOG ID=0x5B

This function allows to download the log base.

5.11.2.1 REQUEST

Identifier value	0x5B	
Length value	0x0005	
Value (Parameters)	Log Base Id	1 byte
	Offset from current line	2 bytes
	Number of lines	2 bytes

Log Base Id :

Defines the number of the base. In V1.1 this parameter is mandatory but ignored.

Offset from current line :

Offset from the last written line. Represents the line in the base from where the upload starts.

Number of lines:

This parameter is the number of line to upload from « Offset from current line. » This parameter must be ranged between 1 and 512 (V1.1 specification).

5.11.2.2 REPLY

Identifier value	0x5B	
Length value	0x0003 + L	
Value (Parameters)	Request status	1 byte
	Number of lines	2 bytes
	Data	L bytes

Request status:

ILV_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	Input parameters error.

Number of lines :

Number of line really uploaded. This number is equal to 0 in case of error.

Data:

Lines in binary format³.

³ For more information about the format of the log data, please contact your SAGEM SA sales representative.

5.11.3 ERASE LOG ID=0x5C

This function erases the log base.

Warning : the function execution does not depend on the “Log Enable” flag.

5.11.3.1 REQUEST

Identifier value	0x5B	
Length value	0x0001	
Value (Parameters)	Log Base Id	1 byte

Log Base Id:

Defines the number of the base. In V1.1 this parameter is mandatory but ignored.

5.11.3.2 REPLY

Identifier value	0x5B	
Length value	0x0002	
Value (Parameters)	Request status	1 byte
	Erase status	1 bytes

Request status:

ILVSTS_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	Input parameters error.

Erase status :

ILVSTS_OK	The execution of the function succeeded
ILVSTS_FLASH_ERROR	An error occurred during the access to the base.

5.11.4 Log Format Specifications

5.11.4.1 BASE STRUCTURE

Log Base : 240 Kbytes.	Line 1 : 64 bytes.	###
	Line 2 : 64 bytes.	###
	...	
	Line k-1 : 64 bytes.	###
	Line k : 64 bytes.	First free record.
	Line k+1 : 64 bytes.	
	...	
	Line 3840 : 64 bytes.	

Line size : 64 bytes.



 : Written record.
 : Free record.

Figure 6 : Log base structure

Note : when the base is full the administrator has to erase the whole base.

5.11.4.2 LOGGED OPERATIONS

The following biometric operations are logged:

- Local identification.
- Administrator identification.
- ILV identification.
- Local enrollment.
- Administrator enrollment.
- ILV enrollment.
- ILV authentication.
- Contactless authentication.

5.11.4.3 LINE STRUCTURE

5.11.4.3.1 Overview

There are three log types :

- Enroll record.
- Authent record.
- Identification record.

Each record is written in line which has the following generic form :

Line 1	Record Date (12 bytes)	Action type (1byte)	Binary data
	64 bytes		
...			
Line k-2	Record Date (12 bytes)	Action type (1byte)	Binary data
	64 bytes		
Line k-1	Record Date (12 bytes)	Action type (1byte)	Binary data
	64 bytes		

- “Record Date” field is coded in ASCII in the following format : DDMMYYHHMMSS. The following value :

Record Date (12 bytes)
323530373032313533353235

will corresponds to 25/07/02 15:35:25.

- “Action type” byte defines the structure of the binary data in the record enroll, authent or ident).
- Data format alignment is **big endian**.

5.11.4.3.2 Enrollment record

5.11.4.3.2.1 Associated structure

```

{
    byte          m_puc_Date[12];
    byte          m_uc_Action;
    byte          m_uc_FlashType;
    byte          m_puc_BaseName[15];
    byte          m_uc_EnrolType;
    byte          m_uc_NbFinger;
    byte          m_uc_Export;
    unsigned short m_us_Timeout;
    byte          m_puc_UserId[20];
    unsigned short m_us_Duration;
    byte          not used, ignore it;
    byte          not used, ignore it;
    byte          not used, ignore it;
    byte          not used, ignore it;
    byte          m_uc_Result;
}
T_SLOG_ENROLL;

```

5.11.4.3.2.2 Structure description

Field	Description	Size
Date and time	m_puc_Date[12] Format : DDMMYYHHMMSS.	12
Action type	m_uc_Action Local enrollment TLOG_ENROLL ILV enrollment TLOG_ENROLL_ILV Administrator enrollment TLOG_ENROLL_ADMIN	1 0x10 0x11 0x12
Base	m_uc_FlashType Mobi 0, Additionnal 1.	1
Base Name	m_puc_BaseName[15]	15
Enrollment type	m_uc_EnrolType 0 : two shut. 1 : one shut.	1
Number of fingers	m_uc_NbFinger	1
PK exportation	m_uc_Export PK exportation format <ul style="list-style-type: none"> ▪ 0, no exportation. ▪ 1, exportation enroll is PKCOMP256. ▪ 170-255 compression size. 	1

Timeout	m_us_Timeout	2
User Id	m_puc_UserId[20]	20
Operation duration	m_us_Duration	2
	(in tenth of second)	
Result	m_uc_Result	1
	Operation result	
	Success	
	LOG_ENROLL_OK	0x00
	Failed	
	LOG_ENROLL_FAILED	0x01
	Bad request	
	LOG_ENROLL_BADILV	0x10
	Biometric error	
	LOG_ENROLL_BIO	0x11
	PK error	
	LOG_ENROLL_PK	0x12
	Base error	
	LOG_ENROLL_BASE	0x13
	Bad signature (if signed request)	
	LOG_ENROLL_SIGNATURE	0x14
	Timeout	
	LOG_ENROLL_TIMEOUT	0x19
	Finger already in base	
	LOG_ENROLL_ALREADY_FINGER	0x20
	User already in base	
	LOG_ENROLL_ALREADY_USER	0x21
	Other error	
	LOG_ENROLL_ERROR	0xFF

Table 3 : Enrollment structure description

5.11.4.3.3 Identification record

5.11.4.3.3.1 Associated structure

```

Typedef struct
{
    byte          m_puc_Date[12];
    byte          m_uc_Action;
    byte          m_uc_FlashType;
    byte          m_puc_BaseName[15];
    byte          m_puc_UserId[20];
    byte          not used, ignore it;
    unsigned short m_us_Timeout;
    unsigned short m_us_Duration;
    short         m_s_PersonIndex;
    byte          m_uc_Result;
} T_SLOG_IDENTIFY ;

```

5.11.4.3.3.2 Structure description

Field	Description	Size
Date and time	m_puc_Date[12] Format : DDMMYYHHMMSS.	12
Action type	m_uc_Action Local ident (mode 0) TLOG_IDENT 0x30 Local ident in merged mode (mode 5) TLOG_IDENT_FUSION 0x00 ILV ident TLOG_IDENT_ILV 0x31 Admin ident TLOG_IDENT_ADMIN 0x32	1
Base	m_uc_FlashType Mobi 0, Additionnal 1.	1
Base name	m_puc_BaseName[15]	15
User Id	m_puc_UserId[20]	20
Timeout	m_us_Timeout	2
Operation duration	m_us_Duration (in tenth of seconds)	2
Base index	m_s_PersonIndex -1 if failed.	2

Operation result	m_uc_Result	
	Operation result	1
	Success	
	LOG_IDENT_OK	0x00
	Non recognized	
	LOG_IDENT_FAILED	0x01
	User is not on time (time mask features)	
	LOG_IDENT_NOT_ON_TIME	0x02
	Bad ILV	
	LOG_IDENT_BADILV	0x10
	Biometric error	
	LOG_IDENT_BIO	0x11
	PK error	
	LOG_IDENT_PK	0x12
	Base error	
	LOG_IDENT_BASE	0x13
	Timeout	
	LOG_IDENT_TIMEOUT	0x19
	Identified user but with no administration rights	
	LOG_IDENT_NOT_ADMIN	0x40
	Generic error	
	LOG_IDENT_ERROR	0xFF

Table 4 : Identification structure description

Note about operation duration:

Before 4.4 software revision.

In case of success relay switching time has to be subtracted from operation duration to retrieve identification real time. For example, if relay time is set to 4 seconds and operation duration is 7 seconds, real identification time is 3 seconds. This point has been corrected in 4.4 software revision.

5.11.4.3.4 Authentication record

5.11.4.3.4.1 Associated structure

```
{
    byte          m_puc_Date[12];
    byte          m_uc_Action;
    byte          m_uc_AcquisitionTh;
    unsigned short m_us_Timeout;
    unsigned short m_us_MatchingTh;
    byte          m_puc_UserId[20];
    unsigned short m_us_Duration;
    byte          m_uc_Result;
    byte          m_uc_NbFinger;
    unsigned short not used, ignore it;
    byte          m_uc_MatchFinger;
} T__SLOG_AUTHENT ;
```

5.11.4.3.4.2 Structure description

Field	Description	Size
Date and time	m_puc_Date[12] Format : DDMMYYHHMMSS.	12
Action type	m_uc_Action ILV authent TLOG_AUTH_ILV 0x21 Badge authentication (mode 1) TLOG_AUTH_BADGE 0x23 Contactless authentication with database (mode 4) TLOG_AUTH_CTL_WODB_ID 0x25. Contactless authentication without database (mode 3) TLOG_AUTH_CTL_WODB_ID_ONLY_TERMINAL 0x22 TLOG_AUTH_CTL_WODB_PKS_TERMINAL 0x24 TLOG_AUTH_CTL_WODB_BIOPIN_TERMINAL 0x26 TLOG_AUTH_CTL_WODB_PIN_TERMINAL 0x27 TLOG_AUTH_CTL_WODB_PIN_THEN_PKS_TERMINAL 0x28 TLOG_AUTH_CTL_WODB_PIN_THEN_BIOPIN_TERMINAL 0x29 TLOG_AUTH_CTL_WODB_ID_ONLY_CARD 0x2A TLOG_AUTH_CTL_WODB_PKS_CARD 0x2B TLOG_AUTH_CTL_WODB_BIOPIN_CARD 0x2C TLOG_AUTH_CTL_WODB_PIN_CARD 0x2D TLOG_AUTH_CTL_WODB_PIN_THEN_PKS_CARD 0x2E TLOG_AUTH_CTL_WODB_PIN_THEN_BIOPIN_CARD 0x2F Contactless authentication without database in merged mode (mode 5) TLOG_AUTH_CTL_WODB_ID_ONLY_TERMINAL_FUSION 0x02 TLOG_AUTH_CTL_WODB_PKS_TERMINAL_FUSION 0x04 TLOG_AUTH_CTL_WODB_BIOPIN_TERMINAL_FUSION 0x06 TLOG_AUTH_CTL_WODB_PIN_TERMINAL_FUSION 0x07 TLOG_AUTH_CTL_WODB_PIN_THEN_PKS_TERMINAL_FUSION 0x08 TLOG_AUTH_CTL_WODB_PIN_THEN_BIOPIN_TERMINAL_FUSION 0x09 TLOG_AUTH_CTL_WODB_ID_ONLY_CARD_FUSION 0x0A TLOG_AUTH_CTL_WODB_PKS_CARD_FUSION 0x0B TLOG_AUTH_CTL_WODB_BIOPIN_CARD_FUSION 0x0C TLOG_AUTH_CTL_WODB_PIN_CARD_FUSION 0x0D TLOG_AUTH_CTL_WODB_PIN_THEN_PKS_CARD_FUSION 0x0E TLOG_AUTH_CTL_WODB_PIN_THEN_BIOPIN_CARD_FUSION 0x0F	1
Acquisition threshold	m_uc_AcquisitionTh	1
Timeout	m_us_Timeout	2
Matching threshold	m_us_MatchingTh	2
User Id	m_puc_UserId[20]	20
Operation duration	m_us_Duration (in tenth of second)	2

Result	m_uc_Result	1
	Success	
	LOG_AUTH_OK	0x00
	Not authenticated	
	LOG_AUTH_FAILED	0x01
	User is not on time (time mask features)	
	LOG_AUTH_NOT_ON_TIME	0x02
	Bad ILV parameters	
	LOG_AUTH_BADILV	0x10
	Biometric error	
	LOG_AUTH_BIO	0x11
	PK error	
	LOG_AUTH_PK	0x12
	Bad PK signature (in secure mode)	
	LOG_AUTH_SIGNATURE	0x14
	Timeout	
	LOG_AUTH_TIMEOUT	0x19
	Generic error	
	LOG_AUTH_ERROR	0xFF
Number of finger	m_uc_NbFinger	1
Matched finger number	m_uc_MatchFinger	1

Table 5 : Authentication structure description

Important Note :

Bits 7 and 8 of the *m_uc_action* byte are reserved for the **Time and Attendance option**.

- If T&A option is deactivated, bits 7 and 8 value is 0.
- If T&A option is activated, bits 7 & 8 can take the following values, according to the transaction performed :

Action Field							
T&A Transaction	<i>m_uc_action</i> byte						
	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2
IN	0	0	TLOG_AUTH_ILV				
IN DUTY	1	0	TLOG_AUTH_BADGE				
OUT	0	1	TLOG_AUTH_CTL_WDB_ID				
OUT DUTY	1	1	...				

5.12 TIME MASK FUNCTIONS DESCRIPTION

The MorphoAccess™ terminal is able to grant access to a user according to its time mask.

A user time mask is a bit array formatted as follow:

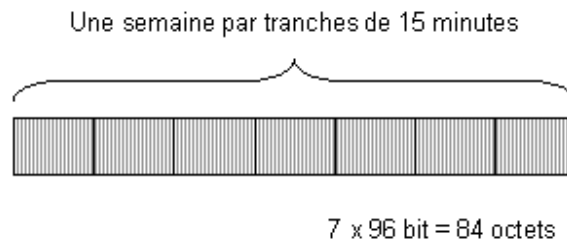


Figure 7 : time mask structure

The week is starting on Sunday as described in ANSI standards.

How to use time mask features ?

During base creation, a "time mask" additional field must be created.

When adding a record or enrolling a user this field must be filled with the corresponding data.

5.12.1 SET TIME MASK ID=0x42

This function allows to set a user time mask.

5.12.1.1 REQUEST

Identifier value	0x42	
Length value	0x0058 + <L>	
Value(Parameters)	Base Id	1 byte
	User ID	L bytes
	Time mask	84 bytes

Base Id :

ID of the database in which the user is registered.

User ID :

An ILV formatted data containing the user ID whose time mask is set.

Identifier value	ID_USER_ID	
Length value	0x0000 + <L>	
Value	Value	L bytes (<25)

Time mask:

An ILV formatted data that containing the time mask to set.

Identifier value	ID_TMSK	
Length value	0x0054	
Value	Time mask	84 bytes

5.12.1.2 REPLY

Identifier value	0x42		
Length value	0x0002		
Value (Parameters)	Request status		1 byte
	Result		1 byte

Request status:

ILV_OK	The execution of the function succeeded.
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	Input parameters error.
ILVERR_BASE_NOT_FOUND	Used database does not exist.
ILVERR_FIELD_NOT_FOUND	Database cannot handle time masks.
ILVERR_FIELD_INVALID	Database cannot handle time masks.
ILVERR_INVALID_USER_ID	User was not found.

Result:

ILVSTS_OK	The execution of the function succeeded
ILVSTS_LATENT	An error occurred during the execution of the function.
ILVSTS_DB_FULL	Input parameters error.

5.12.2 GET TIME MASK ID=0x43

This function allows to get a user time mask.

5.12.2.1 REQUEST

Identifier value	0x43	
Length value	0x0001 + <L>	
Value(Parameters)	Base Id	1 byte
	User ID	L bytes

Base Id :

ID of the database in which the user is registered.

User ID :

An ILV formatted data containing the user ID whose time mask is set.

Identifier value	ID_USER_ID	
Length value	0x0000 + <L>	
Value	Value	L bytes (<25)

5.12.2.2 REPLY

Identifier value	0x43	
Length value	0x0059	
Value (Parameters)	Request status	1 byte
	Result	1 byte
	Time mask	87 bytes

Request status:

ILV_OK	The execution of the function succeeded.
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	Input parameters error.
ILVERR_BASE_NOT_FOUND	Used database does not exist.
ILVERR_FIELD_NOT_FOUND	Database cannot handle time masks.
ILVERR_FIELD_INVALID	Database cannot handle time masks.
ILVERR_INVALID_USER_ID	User was not found.

Result:

ILVSTS_OK	The execution of the function succeeded
ILVSTS_LATENT	An error occurred during the execution of the function.

Time mask:

An ILV formatted data that containing the time mask.

Identifier value	ID_TMSK	
Length value	0x0054	
Value	Time mask	84 bytes

5.13 MULTILINGUAL FUNCTIONS DESCRIPTION

5.13.1 Set user message ID=0x40

This function sets a message in the user message table. Each message is defined by a 19 characters string and an ID. Message Ids are defined chapter 5.21.7.

This function adds a message in the user language zone if it does not exist.

5.13.1.1 REQUEST

Identifier value	0x40	
Length value	L1+3 + <L2+3> + ... + <Li+3>+ ... + <Ln+3>	
Value(Parameters)	User Message Declaration 1	L1+3 bytes
	User Message Declaration 2	L2+3 bytes
	...	
	User Message Declaration i	Li+3 bytes
	...	
	User Message Declaration n	Ln+3 bytes

User Message Declaration :

This ILV defines the value of a given message.

Identifier value	ID_USER_MESSAGE	
Length value	Li	
Value(Parameters)	User Message Id	1 byte
	Message Text	Li-1 bytes

User Message Id :

The Id of the message to edit. If the message has already been set, an error code will be returned. To set the message again, the whole message table must be erased with the "Erase User Message Table" function.

User message Ids are listed in chapter 0 : User message ids.

Message Text :

This Null terminated string defines the new message text.

5.13.1.2 REPLY

Identifier value	0x40	
Length value	0x0002 + <5 bytes> + ... + <5 bytes>	
Value (Parameters)	Request status	1 byte
	<User Message Error 1>	5 bytes
	...	
	<User Message Error j>	5 bytes
	...	
	<User Message Error k>	5 bytes

Request status:

ILVERR_OK	The execution of the function succeeded
ILVERR_BADPARAMETER	Input parameters error.

User Message error :

This ILV is returned only if the update of a given message failed. It usually happens when the message has already been defined.

Identifier value	ID_USER_MESSAGE	
Length value	0x0002	
Value(Parameters)	User Message Id	1 byte
	Error status	1 byte

ILVERR_INVALID_ACCESS	The message has already been defined.
ILVERR_BADPARAMETER	“User Message Id” is out of range.
ILVERR_ERROR	An error occurred.
ILVERR_FLASH_INVALID	An undefined error occurred.

5.13.2 ERASE USER TABLE ID=0x41

This function erases the whole user message table.

5.13.2.1 REQUEST

Identifier value	0x41
Length value	0x0000

5.13.2.2 REPLY

Identifier value	0x41	
Length value	0x0001	
Value (Parameters)	Request status	1 byte

Request status:

ILVSTS_OK	The execution of the function succeeded
ILVERR_ERROR	An error occurred.
ILVERR_BADPARAMETER	Input parameters error.
ILVERR_FLASH_INVALID	An undefined error occurred.

5.14 PROXY FUNCTIONS DESCRIPTION

5.14.1 PRINT SCREEN MESSAGE ID=0x54

This function adds a message on a new screen at the position specified by Position X and Position Y. this

5.14.1.1 REQUEST

Identifier value	0x54	
Length value	0x0003+<L>	
Value(Parameters)	Position X	1 byte
	Position Y	1 byte
	Timeout	1 byte
	Message	L bytes

Position X :

Position Y :

These 2 settings allow to configure the position of the string in the screen.
The range of X is 0 to 136
The range of Y is 0 to 34

Timeout :

Not yet implemented. Message will be displayed until next print screen command call.

Parameters :

String to print on the screen (ASCII mode)
The length of the message limited to 90 characters (3 lines of 30 characters).

5.14.1.2 REPLY

Identifier value	0x54	
Length value	0x0001	
Value(Parameters)	Status	1 byte

Status :

ILV_OK	The function completed successfully
ILVERR_BADPARAMETER	Input parameters error.
ILVERR_ERROR	An error occurred during the execution of the function.

Notes :

When a MorphoAccess™ terminal is not in proxy mode, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

5.14.2 READ FROM KEYBOARD ID=0x55

This function performs a keyboard read. A new screen is pushed.

5.14.2.1 REQUEST

Identifier value	0x55	
Length value	0x0002+<L>	
Value(Parameters)	Secret mode	1 byte
	Time of input	1 byte
	Prompt	L bytes

Secret Mode:

Not yet implemented. Must be set to 0x01. By default it is configured in secret mode.

Time of input:

Defines the time in seconds during which the user is invited to enter data. This value must be set between 1 second and 255 seconds.

Prompt:

This string defines the input prompt printed on the screen. This parameter is mandatory and the message length can not exceed 29 characters.

Note:

For the moment the maximum length of the input zone is 20 characters.

5.14.2.2 REPLY

Identifier value	0x55	
Length value	0x0001+ <L>	
Value(Parameters)	Status	1 byte
	Data	L bytes

Status :

ILV_OK	The function completed successfully
ILVERR_BADPARAMETER	Input parameters error.
ILVERR_ERROR	An error occurred during the execution of the function.

Data :

Keyboard data (ASCII mode). This string is not null terminated.

Notes :

When a MorphoAccess™ terminal is not in proxy mode, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

5.14.3 ACCESS AUTHORIZATION or EMERGENCY ID=0x56

This function is a way to open access or to refuse it

When access is granted the relay switches. The duration is defined in the relay parameters.

When access is refused the led is red during 2 seconds and a “beep” is emitted.

This frame is also used for the emergency feature: the use of a particular parameter turns the terminal into an emergency state which opens the relay and keeps it opened indefinitely. The frame has to be sent a second time with another parameter to stop the emergency state and close the relay.

5.14.3.1 REQUEST

Identifier value	0x56	
Length value	0x0001	
Value(Parameters)	Parameter	1 byte

Parameter :

Access authorization (typical use):

The value 0x01 opens the access and switches the green LED on, whereas 0x00 refuses access and switches the red LED on.

Emergency:

The value 0x02 turns the terminal into an emergency state: the access is opened and kept opened indefinitely. On receiving of the same request containing the parameter 0x01, the terminal leaves the emergency state then executes the following action : opens the access and switches the green LED on.

5.14.3.2 REPLY

Identifier value	0x56	
Length value	0x0001	
Value(Parameters)	Status	1 byte

Status :

ILV_OK	The function completed successfully
ILVERR_ERROR	An error occurred during the execution of the function.

Notes :

When a MorphoAccess™ terminal is not in proxy mode, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

The emergency feature has to be activated in the MorphoAccess's registry. The proxy mode does not need to be activated to use the emergency feature.

The host must not send a request DISTANT_SESSION_CLOSE or any other ILV (except ILV emergency) while the terminal is in emergency state: it could make the terminal leaving this state and closing the access (see [5.21.6]).

5.14.4 WIEGAND DATACLOCK READ ID=0x52

This function performs a read on Wiegand or DataClock input (according to the MorphoAccess™ hardware configuration).

5.14.4.1 REQUEST

Identifier value	0x52	
Length value	0x0002	
Value(Parameters)	Timeout	2 bytes

After timeout (in seconds), the MorphoAccess™ replies if no data was read on the Wiegand / Dataclock input. Timeout = 0 means infinite timeout. The maximum value of this parameters is 1000 seconds.

5.14.4.2 REPLY

Identifier value	0x52	
Length value	0x0002 + <L ₁ > + <L ₂ >	
Value(Parameters)	Request Status	1 byte
	Matching Result	1 byte
	Facility code	L ₁ bytes
	Custom data	L ₂
	User ID	L ₃ bytes

Request Status / Matching Result :

ILVERR_BADPARAMETER	Input parameters error.
ILVERR_TIMEOUT	No data has been received during the timeout specified
ILV_OK /	Invalid data has been received
ILVSTS_WIEGAND_DATACLOCK_READ_ERROR	
ILV_OK / ILVSTS_OK	Successful read

Facility code:

This ILV is present if the read is successful and if the MorphoAccess™ is configured in Wiegand IN mode. The value is coded as a string.

Identifier value	ID_FACILITY_CODE	
Length value	0x0000 + <L ₁ >	
Value	Facility code	L ₁ bytes byte

Custom Data:

This ILV is present if the Input Wiegand frame has been configured to contain a custom data. The value is coded as a string.

Identifier value	ID_CUSTOM_DATA	
Length value	0x0000 + <L ₂ >	
Value	Facility code	L ₂ bytes byte

User ID:

This ILV is present if the read is successful. The value is coded as a string.

Identifier value	ID_USER_ID	
Length value	0x0000 + <L ₃ >	
Value	User Data field	L ₃ bytes

Notes :

When a MorphoAccess™ terminal is not in proxy mode, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

5.15 CONTACTLESS FUNCTIONS DESCRIPTION

It is possible to connect a Deister contactless card reader to port COM1 or to use the internal MIFARE reader of the MorphoAccess™ 220. To enable this feature, the configuration key */cfg/Maccess/contactless/reader type* should be set to 1 for Deister reader and 2 for internal Reader. Using Deister reader, port COM1 is disabled for ILV communication and ID transmission. Moreover parameters are fixed to : 9600 bauds, 8 bits of data, no parity, no handshake and 1 stop bit.

Data organisation according to MIFARE standards.

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

Data can be accessed by blocs as follows :

	Bloc 0	Bloc 1	Bloc 2	Bloc 3
Sector 0	<i>Bloc 1</i>	<i>Bloc 2</i>	<i>Bloc 3</i>	
Sector 1	<i>Bloc 4</i>	<i>Bloc 5</i>	<i>Bloc 6</i>	
...				
Sector 15	<i>Bloc 46</i>	<i>Bloc 47</i>	<i>Bloc 48</i>	

5.15.1 CONTACTLESS READ ID=0x57

This function is an interface to perform some specific functionalities. If an external product is connected this command allows to read data at the address specified in parameters.

5.15.1.1 REQUEST

Identifier value	0x57		
Length value	0x0004		
Value(Parameters)	ID function	1 byte	
	Parameters	3 bytes	

ID function :

ID of the function to perform.

Parameters :

Parameters associated with each function.

An address of card parameter has this structure:

<Address xxx> is composed of 3 bytes: <N><C>

: First block number to read (1 to 48)

<N>: Number of blocks to read (1 to 48)

<C>: Key number for the read (1or 2)

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

Notes :

For the moment there are two specific functions implemented in this way

- Read serial number of card reader (ID = AC_READ_SERIAL_NUMBER). Even if it is not necessary to have an address to read the serial number, the field has to be set.
- Read data in a card (ID = AC_READ_DATA_CARD)

5.15.1.2 REPLY

Identifier value	0x57	
Length value	0x0002+<L>	
Value(Parameters)	ID function	1 byte
	Status	1 byte
	Data	L bytes

Each function has a specific data and status associated with.

Reply Status :

STATUS_CARD_PRESENT	Card present
STATUS_CARD_NO_PRESENT	Card no present
STATUS_ERROR	Error read
STATUS_SUCCESS	Successful read
STATUS_WRONG_CARD	Card has been changed
STATUS_AUTHENT_ERROR	Wrong keys
STATUS_ERROR	Error read
STATUS_CARD_CLOSED	Card not opened
ILVERR_ERR	An error occurred
ILVERR_BADPARAMETER	Bad input parameters

Data :

ID function :

ID function	Data
AC_READ_SERIAL_NUMBER	Serial number
AC_READ_DATA_CARD	Datas read from the card

Notes :

When the Deister contactless card reader option is not activated on the MorphoAccess™ terminal, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

5.15.2 CONTACTLESS AUTHENT ID=0x59

This function is an interface to perform an authenticate matching Pk on a badge and on fingerprint.

Identifier value	0x59	
Length value	0x0005+< L ₁ > + ... + < L _i > + <K> + <J>	
Value(Parameters)	Timeout	2 bytes
	Matching Threshold	2 bytes
	Acquisition Quality Threshold	1 byte
	Address Biometric Data 1	L ₁ bytes
	...	
	Address Biometric Data i	L _i bytes
	Address of data for hashing	K bytes
	Address of signature	J bytes

5.15.2.1 REQUEST

Timeout, Matching enrollment and Acquisition Quality Threshold :

parameters take the same values that the ones in the command AUTHENTICATE (ID = 0x20) .
Acquisition Quality Threshold are not yet implemented.

Address Biometric Data 1 :

Address biometric data i :

This parameters give addresses containing the reference minutiae of fingerprint. The reference minutiae are compressed with algorithm PKCOMP (with MorphoKit for example)

Notes:

It is possible to send PKs with ID_ADDRDATA, the verification of signature will be OK, but it is very important to send the Pks with ID_ADDRPK otherwise the authentication will be impossible, same thing with signature. For the moment this ILV must not be superior to 500 bytes

Identifier value	ID_ADDRPK	
Length value	0x0003	
Value(Parameters)	Address	3 bytes

Address :

An address of card parameter has this structure:

<Address xxx> is composed of 3 bytes: <N><C>

: First block number to read (1 to 48)

<N>: Number of blocks to read (1 to 48)

<C>: Key number for the read (1or 2)

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

Address of data for hashing :

This packet gives address containing the data used for the buffer hashing.

Identifier value	ID_ADDRDATA		
Length value	0x0004		
Value(Parameters)	Numbers of bytes	1 byte	
	Address		3 bytes

number of bytes :

Is for the number of bytes to take in consideration. It can be set from 1 to a maximum of 64 bytes

Address :

An address of card parameter has this structure:

<Address xxx> is composed of 3 bytes: <N><C>

: First block number to read (1 to 48)

<N>: Number of blocks to read (1 to 48)

<C>: Key number for the read (1or 2)

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

Address of signature :

If a verification of signature is performed (for the moment with algorithm DSA) a buffer has to be given to make a hash. This parameter aims at configuring this buffer:

Each ILV packet contains an address which can be a Pk, Data or the signature. ILV packets have to be sent in the same order that the buffer signed in order to allow the build of the buffer by the application. The signature has to be sent the last one.

Notes :

This packet is ignored if the verification of Pk by a signature is not performed.

Identifier value	ID_ADDRSIGN		
Length value	0x0003		
Value(Parameters)	Address		3 bytes

Address :

An address of card parameter has this structure:

<Address xxx> is composed of 3 bytes: <N><C>

: First block number to read (1 to 48)

<N>: Number of blocks to read (1 to 48)

<C>: Key number for the read (1or 2)

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

For example :

If the buffer signed is made with: fingerprint1,data1,data2, fingerprint2, 5 ILV will be sent:

First one the ILV with <address fingerprint1>, then ILV with <address data1>,then <address data2>,<address fingerprint2>, and finally <address signature>

5.15.2.2 REPLY

Identifier value	0x59	
Length value	0x0002	
Value(Parameters)	Status	1 byte
	Matching result	1 byte

Status :

ILV_OK	The function completed successfully
ILVERR_ERROR	An error occurred during the execution of the function.
ILVERR_BADPARAMETER	The matching threshold value or timeout value are not in the range ; or there is no input biometrics data
ILVERR_INVALID_MINUTIAE	The reference ILV minutiae is not valid : bad identifier, corrupted minutiae.
ILVERR_TIMEOUT	The finger detection timeout has expired
ILVERR_CMD_INPROGRESS	Another command is already in progress
ILVERR_CARD_PROBLEM	A card problem occurs
ILVERR_BAD_SIGNATURE	Error in check of signature
ILVERR_BIO_INPROGRESS	An Identification or an authenticate is processing, retry later

Matching Result :

This is the result of the matching between the reference minutiae and the calculated one.

ILVSTS_HIT	The comparison succeed
ILVSTS_NO_HIT	It is not the same finger
ILVSTS_LATENT	The system detected a latent fingerprint in the input fingerprint.

Note :

If the request status differs from ILV_OK, the matching result is not returned.

Notes :

When the Deister contactless card reader option is not activated on the MorphoAccess™ terminal, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

5.15.3 CRYPTO WRITEID=0x58

This command is a way to send MIFARE keys to the reader card to decrypt data of the badge sector by sector

5.15.3.1 REQUEST

Identifier value	0x58	
Length value	0x000E	
Value(Parameters)	Key number	1 byte
	Sector number	1 byte
	Keys sector	12 bytes

Key number :

This parameter takes two values 1 or 2.

For an internal reader this parameter has no effect

For a Deister™ external reader this parameter corresponds to the deister set of keys.

Sector number :

This value can be set from 0 to 15 (Mifare Deister reader) or from 0 to 39 (Mifare ACG reader) .

Keys sector :

This value is divided in 6 bytes for keys A and 6 bytes for keys B.

5.15.3.2 REPLY

Identifier value	0x58	
Length value	0x0001	
Value(Parameters)	Status	1 byte

Status :

ILV_OK	The function completed successfully
ILVERR_BADPARAMETER	Problem with input parameters
ILVERR_ERROR	An error occurred during the execution of the function.

Notes :

When the Deister contactless card reader option is not activated on the MorphoAccess™ terminal, the command is invalid. Therefore its reply is CMD_INVALID_REQUEST (ID = 0x50).

5.16 DATA STRUCTURE (MORPHOACCESS™ 220 ONLY)

5.16.1 MorphoAccess™ Tags

With MorphoAccess™ 220, a MIFARE can be used to trigger an authentication. In that case, biometric data are stored in a TLV format (Tag – Length – Value).



T : 1 byte data identifier.

L : 2 byte size of the V field. Length is encoded in little endian.

V : value of the data field.

5.16.2 ID Tag

Data type	Size (bytes)	Tag (Hex)
ID	24	0x32

This tag contains a unique card identifier. This ID can be used as an index in the local database of the MorphoAccess™. It is sent to the access control system on a positive authentication. This tag holds a length fixed string. Data are then padded with null characters.

5.16.3 Name Tag

Data type	Size (bytes)	Tag (Hex)
Name	20	0x20

This tag contains the name of the cardholder. This name will be displayed on a positive authentication. This tag holds a length fixed string. Data are then padded with null characters.

5.16.4 Minutiae 1 Tag

Data type	Size (bytes)	Tag (Hex)
Minutiae 1	170	0x30

This tag contains the minutiae of the first enrolled finger according to the PKCOMP170 format.

5.16.5 Minutiae 2 Tag

Data type	Size (bytes)	Tag (Hex)
Minutiae 2	170	0x31

This tag contains the minutiae of the second enrolled finger according to the PKCOMP170 format.

5.16.6 PIN Tag

Data type	Size (bytes)	Tag (Hexa)
PIN	15	0x33

This tag contains the user PIN code.

5.16.7 BIOPIN Tag

Data type	Size (bytes)	Tag (Hexa)
BIOPIN	15	0x34

This tag contains the user BIOPIN code (used instead of the user minutiae).

5.16.8 CARD MODE Tag

Data type	Size (bytes)	Tag (Hexa)
Card mode	1	0x35

This tag contains the authentication method to use.

5.17 FUNCTIONS TABLE

ID	Command
0x01	Set configuration
0x02	<i>Reserved</i>
0x03	Get version
0x04	Reboot
0x06	Get configuration
0x07	Get base configuration
0x08	Ping
0x09	<i>Reserved</i>

0x0A	Default init
0x0F	Garbage collector
0x20	Authentication
0x21	Enrol
0x22	Identify
0x30	Create base
0x31	Get all base config.
0x32	Erase base
0x33	Erase flash
0x35	Add base record
0x36	Remove base record
0x37	<i>Reserved</i>
0x3A	Reset database download.
0x40	Set user message
0x41	Erase user message table
0x42	Set time mask
0x43	Get time mask
0x50	Invalid Request
0x52	Wiegand/Dataclock read
0x53	Set Public Key
0x54	Print screen message
0x55	Keyboard read
0x56	Access authorization
0x57	Contactless read
0x58	Cryptowrite
0x59	Contactless authentication
0x5A	<i>Not Yet Implemented</i>
0x5B	Get log
0x5C	Erase log
0x5D	Get log status
0x63	<i>Reserved</i>
0x64	<i>Reserved</i>
0xAA	<i>Reserved</i>
0xFE	<i>Reserved</i>
0xFF	<i>Internal use only</i>

5.18 ERROR CODES VALUE

Error codes macro	Definition	Value	Hex
ILVERR_WAITING_BIO	A Bio Function is processing, the MorphoAccess™ will answer later	1	0x01
ILV_OK	Successful result	0	0x00
ILVERR_ERROR	An error occurred	-1	0xFF
ILVERR_BADPARAMETER	Input parameters are not valid	-2	0xFE
ILVERR_INVALID_MINUTIAE	The minutiae is not valid	-3	0xFD
ILVERR_INVALID_USER_ID	The User ID does not exist in the database	-4	0xFC

ILVERR_INVALID_USER_DATA	The user data is not valid	-5	0xFB
ILVERR_TIMEOUT	No response after defined time.	-6	0xFA
ILVERR_INVALID_ID_PROTOCOL	The protocol used is not valid	-7	0xF9
ILVERR_ALREADY_ENROLLED	The person is already in this base	-8	0xF8
ILVERR_BASE_NOT_FOUND	The specified base doesn't exists	-9	0xF7
ILVERR_BASE_ALREADY_EXISTS	The specified base already exists	-10	0xF6
ILVERR_BIO_INPROGRESS	Bio Function in progress	-11	0xF5
ILVERR_CMD_INPROGRESS	A command is already in progress	-12	0xF4
ILVERR_FLASH_INVALID	Flash type invalid	-13	0xF3
ILVERR_NO_SPACE_LEFT	Not Enough memory for the creation of a database	-14	0xF2
ILVERR_ADMIN_EXECUTING	Administrator Mode in use.	-15	0xF1
ILVERR_BAD_SIGNATURE	The signature check failed.	-16	0xF0
ILVERR_CARD_PROBLEM	An error occurred while reading the card.	-17	0xEF
ILVERR_ERROR_SL	An error occurred during the execution of Serial Link Configuration.	-18	0xEE
ILVERR_ERROR_WIEGAND	An error occurred during the execution of the output Wiegand/Dataclock Configuration.	-19	0xED
ILVERR_ERROR_NETWORK	An error occurred during the execution of Network Configuration.	-20	0xEC
ILVERR_OUT_OF_FIELD	The number of the additional field is more than 8 or cumulated length of additional user data is more than 216.	-21	0xEB
ILVERR_INVALID_ACCESS	Access cannot be granted because time does not agree with time zone	-22	0xEA
ILVERR_FIELD_NOT_FOUND	Field does not exist	-23	0xE9
ILVERR_FIELD_INVALID	Field size or field name is invalid	-24	0xE8
ILVERR_SECURITY_MODE	Security keys cannot be changed	-25	0xE7
ILV_NOT_IMPLEMENTED	The request is not yet implemented	-99	0x9D

5.19 STATUS CODES VALUE

Status codes macro	Definition	Value	Hex
ILVSTS_OK	Successful	0	0x00
ILVSTS_HIT	Authentication or Identification succeeded	1	0x01
ILVSTS_NO_HIT	Authentication or Identification failed	2	0x02
ILVSTS_LATENT	Security Protection Triggered	3	0x03
ILVSTS_DB_FULL	The database is full.	4	0x04
ILVSTS_DB_EMPTY	The database is empty.	5	0x05
ILVSTS_BAD_QUALITY	Bad finger and/or enrol quality	6	0x06
ILVSTS_DB_OK	The database is right.	7	0x07
ILVSTS_ACTIVATED	The Terminal is activated.	8	0x08
ILVSTS_NOTACTIVATED	The Terminal is not activated.	9	0x09
ILVSTS_DB_KO	The last database command is unsuccessful	10	0x0A
ILVSTS_WIEGAND_DATALOCK_READ_ERROR	Read error on Wiegand / Dataclock input	11	0x0B
ILVSTS_FLASH_ERROR	An error occurred during the access to the base.	12	0x0C

5.20 LOAD ERROR CODES

Error Code :	Value	
SDWN_NO_ERROR (any packet)	0x00	The packet has been successfully downloaded.
SDWN_ERR_BAD_PACKET_NUMBER (any packet)	0x11	Packet number does not correspond to the one awaited.
SDWN_ERR_BAD_HEADER (first packet)	0x12	Base header does not correspond with the base created with "Create Database".
SDWN_ERR_NO_BASE (first packet)	0x13	No base has been created.
SDWN_ERR_BASE_NAME (first packet)	0x14	Base name does not correspond with the base created with "Create Database".
SDWN_ERR_NUMBER_PERS (first packet)	0x15	Number of person does not correspond with the base created with "Create Database".
SDWN_ERR_MEMORY (first packet)	0x16	Memory error. No enough resource to download a base.
SDWN_ERR_OVERLOAD (any packet)	0x17	Too many data have been sent. Base size does not correspond with the base created with "Create Database".
SDWN_ERR_TOO_SMALL (last packet)	0x18	No enough data have been sent. Base size does not correspond with the base created with "Create Database".
SDWN_ERR_WRITING (last packet)	0x19	An error occurred during the base inscription in flash.
SDWN_ERR_GENERIC (any packet)	0x20	Generic error.

5.21 DISTANT SESSION STATUS AND ERROR CODES

5.21.1 Commands ID

ID	Value	
CMD_DISTANT_SESSION	0x63	Distant session ID.

5.21.2 Distant session parameters

Parameter	Value	
ID_OPEN_DISTANT_SESSION	0x01	Open a distant session.
ID_CLOSE_DISTANT_SESSION	0x02	Close a distant session.

5.21.3 Distant session answer status

Status	Value	
DISTANT_SESSION_OPENED	0x01	Distant session opened.
DISTANT_SESSION_CLOSED	0x02	Distant session closed.
DISTANT_SESSION_MEMORY_ERROR	0xE0	Can't allocate resources to open a distant session.
DISTANT_SESSION_ALREADY_OPENED	0xE1	Distant session already opened.
DISTANT_SESSION_ALREADY_CLOSED	0xE2	Distant session already closed.

5.21.4 Error status

Error status	Value	
SDWN_NO_ERROR	0x00	The packet has been successfully downloaded.
SDWN_ERR_BAD_HEADER	0x12	Base header does not correspond with the base created with "Create Database".
SDWN_ERR_NO_BASE	0x13	No base has been created.
SDWN_ERR_BASE_NAME	0x14	Base name does not correspond with the base created with "Create Database".
SDWN_ERR_NUMBER_PERS	0x15	Number of person does not correspond with the base created with "Create Database".
SDWN_ERR_MEMORY	0x16	Memory error. No enough resource to download a base.
SDWN_ERR_OVERLOAD	0x17	Too many data have been sent. Base size does not correspond with the base created with "Create Database".
SDWN_ERR_TOO_SMALL	0x18	No enough data have been sent. Base size does not correspond with the base created with "Create Database".
SDWN_ERR_WRITING	0x19	An error occurred during the base inscription in flash.
SDWN_ERR_READING	0x1A	An error occurred while reading the flash.
SDWN_ERR_BAD_CRC	0x1B	CRC sent by the client and CRC calculated by the MorphoAccess™ don't match. No base is written.
SDWN_ERR_GENERIC	0x20	Generic error.

5.21.5 **Commands not authorized during a distant session.**

The following ILV requests are not authorized during a distant session. Attempting to send these commands will produce the “invalid request” answer.

Command
CMD_AUTH
CMD_BASE_DWN
CMD_CONTACTLESS_AUTH
CMD_CONTACTLESS_READ
CMD_ENROL
CMD_IDEN
CMD_KEYBOARD_CODE
CMD_REBOOT
CMD_RESET_DWN
CMD_SCREEN_MSG
CMD_WIEGAND_DATACLOCK_READ

5.21.6 **Conflicts with Emergency**

While a terminal is in an emergency state, the host must not send a Distant Session Close frame. It could make the terminal leaving the emergency state and closing the access.

In the same way the host must not send any other ILV command (except ILV emergency) , It could make the terminal leaving the emergency state and closing the access.

5.21.7 User Message IDs

User message ID	Corresponding message in the English table	Value	Hex
SINTL_MESSAGE_IDENT_1	Place your finger	0	0x00
SINTL_MESSAGE_IDENT_2	for Identification	1	0x01
SINTL_MESSAGE_IDENT_3	Please	2	0x02
SINTL_MESSAGE_AUTHENT_1	Place your finger	3	0x03
SINTL_MESSAGE_AUTHENT_2	for Authentication	4	0x04
SINTL_MESSAGE_AUTHENT_3	Please	5	0x05
SINTL_MESSAGE_PASS_YOUR_BADGE_1	Pass your badge	6	0x06
SINTL_MESSAGE_PASS_YOUR_BADGE_2	for Authentication	7	0x07
SINTL_MESSAGE_PASS_YOUR_BADGE_3	Please	8	0x08
SINTL_MESSAGE_AUTHENT_AFTER_BADGE_READ_1	Authentication of	9	0x09
SINTL_MESSAGE_AUTHENT_AFTER_BADGE_READ_3	Place your finger	10	0x0A
SINTL_MESSAGE_PROXY	Proxy mode	11	0x0B
SINTL_MESSAGE_USER_NOT_FOUND_1	User not found in	12	0x0C
SINTL_MESSAGE_USER_NOT_FOUND_2	current database	13	0x0D
SINTL_MESSAGE_USER_NOT_FOUND_3		14	0x0E
SINTL_MESSAGE_WELCOME	Welcome	15	0x0F
SINTL_MESSAGE_IDENT_OK	IDENTIFIED	16	0x10
SINTL_MESSAGE_AUTHENT_OK	AUTHENTICATED	17	0x11
SINTL_MESSAGE_IDENT_NOT_OK_1	NOT IDENTIFIED	18	0x12
SINTL_MESSAGE_IDENT_NOT_OK_2		19	0x13
SINTL_MESSAGE_AUTHENT_NOT_OK_1	NOT AUTHENTICATED	20	0x14
SINTL_MESSAGE_AUTHENT_NOT_OK_2		21	0x15
SINTL_MESSAGE_PLEASE_RETRY	Please retry	22	0x16
SINTL_MESSAGE_PLEASE_WAIT	Please wait	23	0x17
SINTL_MESSAGE_IDENT_TIMEOUT_1	IDENTIFICATION	24	0x18
SINTL_MESSAGE_IDENT_TIMEOUT_2	TIMEOUT	25	0x19
SINTL_MESSAGE_AUTHENT_TIMEOUT_1	AUTHENTICATION	26	0x1A
SINTL_MESSAGE_AUTHENT_TIMEOUT_2	TIMEOUT	27	0x1B
SINTL_MESSAGE_TIMEOUT	TIMEOUT	28	0x1C
SINTL_MESSAGE_IDENT_ERROR_1	IDENTIFICATION	29	0x1D
SINTL_MESSAGE_IDENT_ERROR_2	ERROR	30	0x1E
SINTL_MESSAGE_AUTHENT_ERROR_1	AUTHENTICATION	31	0x1F
SINTL_MESSAGE_AUTHENT_ERROR_2	ERROR	32	0x20
SINTL_MESSAGE_NO_LICENCE	NO LICENCE	33	0x21
SINTL_MESSAGE_NO_DATABASE	No Database	34	0x22
SINTL_MESSAGE_EMPTY_BASE	Empty Database	35	0x23
SINTL_MESSAGE_NO_BASE_MA200_1	Warning	36	0x24
SINTL_MESSAGE_NO_BASE_MA200_2	Base does not exist	37	0x25
SINTL_MESSAGE_NO_BASE_MA200_3	Waiting for data	38	0x26
SINTL_MESSAGE_NO_BASE_MA300_1	Base does not exist	39	0x27
SINTL_MESSAGE_NO_BASE_MA300_2	Please select	40	0x28
SINTL_MESSAGE_NO_BASE_MA300_3	Another one	41	0x29
SINTL_MESSAGE_CONTACT_ADMINISTRATOR_1	Please contact	42	0x2A
SINTL_MESSAGE_CONTACT_ADMINISTRATOR_2	Administrator	43	0x2B

SINTL_MESSAGE_BASE_MANAGEMENT_1	Base management	44	0x2C
SINTL_MESSAGE_BASE_MANAGEMENT_2		45	0x2D
SINTL_MESSAGE_LOG_MANAGEMENT_1	Log management	46	0x2E
SINTL_MESSAGE_LOG_MANAGEMENT_2		47	0x2F
SINTL_MESSAGE_ANALYSE_1		48	0x30
SINTL_MESSAGE_ANALYSE_2	Remove finger	49	0x31
SINTL_MESSAGE_ANALYSE_3	Analysing ...	50	0x32
SINTL_MESSAGE_MOVE_UP	Move up	51	0x33
SINTL_MESSAGE_MOVE_DOWN	Move down	52	0x34
SINTL_MESSAGE_MOVE_LEFT	Move left	53	0x35
SINTL_MESSAGE_MOVE_RIGHT	Move right	54	0x36
SINTL_MESSAGE_PRESS_HARDER	Press harder	55	0x37
SINTL_MESSAGE_BAD_FINGER	Bad finger	56	0x38
SINTL_MESSAGE_OR_BAD_FINGER	or bad finger	57	0x39
SINTL_MESSAGE_ALREADY_ENROLLED	Already enrolled	58	0x3A
SINTL_MESSAGE_ENROLLMENT	Enrollment	59	0x3B
SINTL_MESSAGE_PLACE_FIRST_FINGER	Plac ^e 1st finger	60	0x3C
SINTL_MESSAGE_PLACE_SECOND_FINGER	Plac ^e 2nd finger	61	0x3D
SINTL_MESSAGE_AGAIN	again	62	0x3E
SINTL_MESSAGE_ENROLL_OK_1	Person now	63	0x3F
SINTL_MESSAGE_ENROLL_OK_2	Enrolled	64	0x40
SINTL_MESSAGE_ENROLL_ERROR_1	Enrollment	65	0x41
SINTL_MESSAGE_ENROLL_ERROR_2	Error	66	0x42
SINTL_MESSAGE_USER_ALREADY_ENROLLED_1	USER	67	0x43
SINTL_MESSAGE_USER_ALREADY_ENROLLED_2	ALREADY ENROLLED	68	0x44
SINTL_MESSAGE_ADD_RECORD_ERROR_1	ADDRECORD ERROR	69	0x45
SINTL_MESSAGE_ADD_RECORD_ERROR_2		70	0x46
SINTL_MESSAGE_DEL_RECORD_IN_PROGRESS_1	Del record	71	0x47
SINTL_MESSAGE_DEL_RECORD_IN_PROGRESS_2	in	72	0x48
SINTL_MESSAGE_DEL_RECORD_IN_PROGRESS_3	Progress	73	0x49
SINTL_MESSAGE_DEL_RECORD_OK_1	Person ID :	74	0x4A
SINTL_MESSAGE_DEL_RECORD_OK_3	is deleted	75	0x4B
SINTL_MESSAGE_TIME_MASK_ERROR_1	Time mask	76	0x4C
SINTL_MESSAGE_TIME_MASK_ERROR_2	Error	77	0x4D
SINTL_MESSAGE_TIME_MASK_ERROR_3		78	0x4E
SINTL_MESSAGE_ACCESS_DENIED_1	Access Denied	79	0x4F
SINTL_MESSAGE_ACCESS_DENIED_2		80	0x50
SINTL_MESSAGE_ACCESS_DENIED_3		81	0x51
SINTL_MESSAGE_TIME_MASK_FIELD_ABSENT_1	No time mask field	82	0x52
SINTL_MESSAGE_TIME_MASK_FIELD_ABSENT_2		83	0x53
SINTL_MESSAGE_TIME_MASK_FIELD_INVALID_1	Time mask field	84	0x54
SINTL_MESSAGE_TIME_MASK_FIELD_INVALID_2	Invalid	85	0x55
SINTL_MESSAGE_SECURE_MODE	Secure Mode :	86	0x56
SINTL_MESSAGE_SECURE_KEYS	Keys	87	0x57
SINTL_MESSAGE_SECURE_UPDATED	Updated	88	0x58
SINTL_MESSAGE_SECURE_WARNING	Warning !	89	0x59
SINTL_MESSAGE_SECURE_ERROR	Error !	90	0x5A
SINTL_MESSAGE_SECURE_REQUEST	Bad Request.	91	0x5B
SINTL_MESSAGE_SECURE_NO_KEY	No Key.	92	0x5C

SINTL_MESSAGE_SECURE_BAD_SIGNATURE	Bad Signature.	93	0x5D
SINTL_MESSAGE_MPILV_1	Remote management.	94	0x5E
SINTL_MESSAGE_MPILV_2	Please Wait.	95	0x5F
SINTL_MESSAGE_IDLE_1	Press any key	96	0x60
SINTL_MESSAGE_IDLE_2	To start ident.	97	0x61
SINTL_MESSAGE_IDLE_3	Please	98	0x62
SINTL_MESSAGE_CONTACTLESS_1	Please Present	99	0x63
SINTL_MESSAGE_CONTACTLESS_2	Contactless	100	0x64
SINTL_MESSAGE_CONTACTLESS_3	Smart Card	101	0x65
SINTL_MESSAGE_CONTACTLESS_ERROR_1	Contactless	102	0x66
SINTL_MESSAGE_CONTACTLESS_ERROR_2	Read	103	0x67
SINTL_MESSAGE_CONTACTLESS_ERROR_3	Error	104	0x68
SINTL_MESSAGE_CONTACTLESS_INVALID_1	Contactless	105	0x69
SINTL_MESSAGE_CONTACTLESS_INVALID_2	Data	106	0x6A
SINTL_MESSAGE_CONTACTLESS_INVALID_3	Invalid	107	0x6B
SINTL_MESSAGE_INTERNAL_ERROR		108	0x6C
SINTL_MESSAGE_ITO_NOT_RECOVERED		109	0x6D
SINTL_MESSAGE_FINGER_TOO_MOIST		110	0x6E
SINTL_MESSAGE_BIOMETRIC_OPERATION		111	0x6F
SINTL_MESSAGE_OPERATOR_STOP		112	0x70
SINTL_MESSAGE_BASE_ERROR_1		113	0x71
SINTL_MESSAGE_BASE_ERROR_2		114	0x72
SINTL_MESSAGE_ENTER_PIN_1		115	0x73
SINTL_MESSAGE_ENTER_PIN_2		116	0x74
SINTL_MESSAGE_ENTER_BIO_PIN_1		117	0x75
SINTL_MESSAGE_ENTER_BIO_PIN_2		118	0x76
SINTL_MESSAGE_GOOD_BYE		119	0x77
SINTL_MESSAGE_FUSION_IDENT_1		120	0x78
SINTL_MESSAGE_FUSION_IDENT_2		121	0x79
SINTL_MESSAGE_FUSION_IDENT_3		122	0x7A
SINTL_MESSAGE_FUSION_NO_BASE_1		123	0x7B
SINTL_MESSAGE_FUSION_NO_BASE_2		124	0x7C
SINTL_MESSAGE_FUSION_NO_BASE_3		125	0x7D
SINTL_MESSAGE_AUTHENT_WITH_ID_1		126	0x7E
SINTL_MESSAGE_AUTHENT_WITH_ID_3		127	0x7F

5.22 CONSTANTS

Constant	Value	Hex
DDB_MAX_FIELD_NAME_LEN	6	0x06

5.23 ID VALUE

Constant ID macro	Definition	Value	Hex
ID_PKCOMP	Identifies a PKCOMP ILV (minutiae)	2	0x02
ID_PKMAT	Identifies a PKMAT ILV (minutiae)	3	0x03
ID_USER_ID	Identifies a user data ILV	4	0x04
ID_USER_DATA	Identifies a user ID ILV	5	0x05
ID_COM1	Identifies the first serial link of the Terminal	6	0x06
ID_COM2	Identifies the second serial link of the Terminal	7	0x07
ID_COM3	Identifies the third serial link of the Terminal	8	0x08
ID_WIEGAND	Identifies the Wiegand Driver of the MorphoAccess™	9	0x09
ID_TCPIP_PC	Identifies the TCP/IP configuration of the MorphoAccess™	10	0x0A
ID_FIELD	Identifies the name of a field in database	15	0x0F
ID_FIELD_SIZE	Identifies the size of a field in database	16	0x10
ID_TIMESTAMP	Identifies a time stamp for database maintenance	17	0x11
ID_RELAY	Identifies a relay configuration	18	0x12
ID_DATE	Identifies a date configuration	19	0x13
ID_PUC_DATA	Identifies that the value is a string	20	0x14
ID_C_DATA	Identifies that the value is a character	21	0x15
ID_S_DATA	Identifies that the value is a short	22	0x16

ID_L_DATA	Identifies that the value is a long	23	0x17
ID_DATACLOCK	Identifies the DataClock driver of the MorphoAccess™	27	0x1B
ID_WIEGAND_OPTION	Identifies the DataClock driver options	28	0x1C
ID_APPLI_OPTION	Identifies the application configuration	29	0x1D
ID_LANGUAGE	Identifies the language service configuration	30	0x1E
ID_BASE_CONF	Identifies the base configuration structure.	31	0x1F
ID_USER_MESSAGE	Identifies a user message declaration	32	0x20
ID_FACILITY_CODE	Identifies a facility code ILV	33	0x21
ID_TMSK	Identifies a time mask	36	0x24
ID_GUI	Identifies user interface configuration.	37	0x25
ID_CONTACTLESS	Identifies contactless configuration	38	0x26
ID_USER_INDEX	Identifies a user index ILV.	54	0x36
ID_PKBASE	Identifies a database record template.	58	0x3A
ID_SPEC_ID	Identifies Wiegand/DataClock error ID configuration	61	0x3D
ID_TIME_ATTENDANCE	Identifies Time Attendance configuration	62	0x3E
ID_WIEGAND_ANYBIT	Identifies Wiegand Anybit configuration	63	0x3F
ID_CUSTOM_DATA	Identifies Wiegand custom data configuration	64	0x40
ID_BMP_MODE	"Graphic Mode" parameters.	65	0x41

5.24 CONTACTLESS CODE VALUES

Constant ID macro	Definition	Value	Hex
STATUS_CARD_PRESENT	A card is present, ready to be read	0	0x00
STATUS_CARD_NO_PRESENT	No card present	11	0x0B
STATUS_SUCCESS	Read performed successfully	0	0x00
STATUS_AUTHENT_ERROR	Set of keys to decrypt datas is not OK	12	0x0C
STATUS_WRONG_CARD	The serial number of the card is not OK	13	0x0D
STATUS_CARD_CLOSED	The card to be read is not opened	14	0x0E
STATUS_ERROR	Error while reading	15	0x0F
AC_READ_SERIAL_NUMBER	Serial number of card reader	27	0x1B
AC_READ_DATA_CARD	Read data in a card	28	0x1C

5.25 CONFIGURATION TABLE

5.25.1 Serial Link Configuration

Parameters	Value	Comment
Speed	0x00	1200 bauds
	0x01	2400 bauds
	0x02	4800 bauds
	0x03	9600 bauds
	0x04	19200 bauds
	0x05	28800 bauds
	0x06	38400 bauds
	0x07	57600 bauds
	0x08	115200 bauds
Databits	0x05	5 databits
	0x06	6 databits
	0x07	7 databits
	0x08	8 databits
Stopbits	0x01	1 stopbit
	0x02	2 stopbits
Parity	0x00	No
	0x01	Odd
	0x02	Even
Flow Ctrl Type	0x00	No
	0x01	RTS / CTS (for COM2 only)
	0x02	XON / XOFF
Send	0x00	The COM1 or COM2 output is not activate ⁴
	0x01	The COM1 or COM2 output is activate
Format	0x00	ID is sent in ASCII format
	0x01	ID is sent in Binary format
	0x02	ID is sent in BCD format ⁵

⁴ See the Terminal block board in Installation guide document.

⁵ Binary Code Decimal

5.25.2 Wiegand/Dataclock Configuration

parameters	Value	Comment
Send	0x00	Deactivate the Wiegand/DataClock ⁶ output
	0x01	Activate the Wiegand/DataClock output
Format	0x00	Fixed Value

5.25.3 Setting Up Relay Parameters

Parameters	Value	Comment
Activate	0x00	Relay not active
	0x02	Relay active

⁶ See the Terminal block board in Installation guide document.