Morpho*Wave* XP2

Installation guide

Warning

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Revision history

Version	Date	Reference	Description
01	January 2025	2024_2000081902	Document creation

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1 / Introduction

1.1 > Morpho*Wave* XP₂ terminal

Congratulations for choosing Morpho*Wave* XP₂ Automatic Fingerprint Recognition Terminal!

Morpho*Wave* XP₂ provides an innovative and effective solution for access control applications using very fast acquisitions of four (4) fingerprints without any contact:

Contactless acquisition: The user does NOT need to touch any part of the sensor

Acquisition in movement: Users swipe their hand across the sensor; no need to stop & position fingers. At the end of the swipe, the acquisition is complete.

Among a range of alternative biometric technologies, the use of finger imaging has significant advantages: very fast acquisition from a single wave of the hand through the sensor, and no physical contact between the applicant and the glass.

Each finger constitutes an unalterable physical signature, developed before birth and preserved until death. Unlike DNA, a finger image is unique to each individual - even identical twins.

Morpho*Wave* XP₂ integrates IDEMIA image processing and feature matching algorithms. This technology is based on lessons learned during 30 years of experience in the field of biometric identification and the creation of literally millions of individual fingerprint identification records.

We believe you will find the Morpho*Wave* XP₂ fast, accurate, easy to use and suitable for physical access control.

The Morpho*Wave* XP₂ offers the following advantages:

High quality optical sensor with false finger detection option,

Supports multiple input/output interfaces used in the physical access control industry,

Local Area Network interface for easy interaction with other host systems; LAN and WLAN possibilities,

Intuitive man machine interface with touch panel and display, that is easy to use in both setup and operational modes,

Sturdy wall mounting with easy holding of product during cabling or maintenance,

To ensure the most effective use of your Morpho*Wave* XP₂ terminal, we recommend that you read this Installation Guide completely.

1.2 > Scope of the document

This guide deals with the installation of Morpho*Wave* XP2.

The Morpho*Wave* XP2 product's Regulatory Model Number (RMN) is "MPH-AC010A". The RMN is the main product's identifier in the regulatory documentation and test reports associated to the product.

1.3 > Safety Instructions

1.3.1 > DC Supply

▬ ▬ ▬ means Direct Current (DC)

The installation of this product should be made by a qualified service Person and should comply with all local regulations.

It is strongly recommended to use a class II power supply at 12V-24V 24V (-15% / +10%) and 2.5A min (at 12V) in conformity with Safety Electrical Low Voltage (SELV). The AC power supply cable length should not exceed 10 meters.

This system must be installed in accordance with the National Electrical Code (NFPA 70), and the local authority having jurisdiction.

This product is intended to be installed with a power supply complying with IEC 60950-1 or IEC 62368-1, in accordance with the NEC Class 2 requirements; or supplied by a listed IEC 60950-1or IEC 62368-1 external Power Unit marked Class 2, Limited Power source, or LPS and rated 12VDC 2.5A minimum or 24VDC 1.25 A minimum.

This product has been evaluated by UL in accordance to UL 294, Standard for Access Control System Units, Seventh Edition.

UL 294 performance levels:

Access Control Line Security	Destructive Attack Level	Endurance	Stand-by Power	Conditions
Level 1	Level 4	Level 1	Level 1	NA

For UL 294 compliance the product is to be powered via a UL 294 power supply or access control panel with a class 2 power limited output.

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

Note that all connections of the MorphoWave XP2 terminal described hereafter are of SELV (Safety Electrical Low Voltage) type.

1.3.2 > Power Over Ethernet Plus (POE+)

The terminal is a Class 4 (25.5 W) PD (Powered Device) and required Power Over Ethernet Plus (POE+): 42,5-57V 25,5W.

Power can be provided through RJ-45 connector using a PSE (Power Sourcing Equipement) IEEE802.3at type 2 compliant.

For UL compliance, the units shall be powered via a UL 294B PSE power supply.

Note: UL compliance was verified with Phihong model POE36U-1AT-R Primary rated 100-240VAC 1Amp 50-60Hz; 56VDC, 0.6A Pin 3,6 Return = Pin 1,2

1.4 > Wiring Recommendations

IDEMIA recommends using a AWG16 gauge and 24V power supply when PoE+ supply is not used.

The voltage specified is the one measured on the product block connector: 12V-24V (-15% / +10%).

The voltage drop due to the cable shall be considered. The following table shows the maximum distance between power supply and one (1) unique device, depending on cable gauge and power supply rating:

Gauge AWG	Section (mm²)	Maximum distance (meters) vs power source rating		
		12V+/-10%	12V+/-5%	24V+/-10%
16	1.31	9 m	20 m	300 m
18	0.82	6 m	12 m	200 m
20	0.52	3 m	8 m	120 m
22	0.32	2 m	5 m	75 m

Figure 1: Power supply voltage dropout considerations

Drop voltage = loss of power due to wire resistance and its length: V2 = V1 – Drop voltage

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1.5 > Regulatory, safety and Environmental notices

1.5.1 > European Union (CE) regulatory notices

Declaration of Conformity

$\mathsf{C}\mathsf{E}$

Products bearing the CE marking comply with one or more of the following EU Directives as may be applicable:

Radio Equipment Directive (RED) 2014/53/UE

Ecodesign Directive 2009/125/EC

RoHS Directive 2011/65/EU and 2015/863/EU

Compliance with these directives is assessed using applicable European Harmonised Standards.

Morpho*Wave* XP2 terminals are intended to be used for professional application only (buildings, airport...).

The full Declaration of Conformity is available on demand to your reseller. Please, provide him the product model name or its Regulatory Model Number (Model on the label).

Products with wireless features (EMF)

This product meets the provisions of the EU's Council recommendation 1999/519/EC on the limitation of the exposure of the general public to electromagnetic fields (0 Hz to 300 GHz).

1.5.2 > USA (FCC) regulatory notices

User Information according to FCC 15.21:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

User Information according to Part 15 Statement acc. to FCC 15.19:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device must be fixed installed.

Responsible Party:

> **IDEMIA Identity & Security, N.A**
> 14 Crosby Drive, 2nd Floor
> Bedford MA, 01730
> **USA**

> **Note:**
>
> This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:
>
> - Reorient or relocate the receiving antenna.
> - Increase the separation between the equipment and receiver.
> - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
> - Consult the dealer or an experienced radio/TV technician for help.
> - Shielded cables must be used with this unit to ensure compliance with category B FCC restrictions.

The product FCC ID is: ZBW-MPHAC010A

The device includes a module tested under the FCC rules for a Modular Approval:

> FCC ID: XPYNINAB30

1.5.3 > Canada (IC) regulatory notices

WARNING TO USERS IN CANADA

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with Industry Canada's defined levels of RF exposure requirements, limits set forth for an uncontrolled environment.

This device must be fixed installed.

Responsible Party:

> **IDEMIA Identity & Security Canada Inc.**
> Company Number: 907531-3
> Address: 2872 Bristol Circle
> Suite 100
> Oakville, Ontario L6H 6G4
> **Canada**

The product IC ID is: 11472A-MPHAC010A.

The product includes a module compliant with limits set by Industry Canada; IC ID: 8595A-NINAB30

ATTENTION POUR LES UTILISATEURS AU CANADA

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :

(1) cet appareil ne doit pas provoquer d'interférences, et

(2) cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

Cet appareil est conforme aux niveaux définis par Industrie Canada en matière d'exposition aux radiofréquences, limites établies pour un environnement non contrôlé.

Cet appareil doit être installé de manière fixe.

Partie responsable :

> **IDEMIA Identity & Security Canada Inc.**
> Company Number: 907531-3
> Adresse : 2872 Bristol Circle
> Suite 100
> Oakville, Ontario L6H 6G4
> **Canada**

L'IC ID du produit est : 11472A-MPHAC010A.

Cet appareil contient un module conforme aux niveaux définis par Industrie Canada ; IC ID : 8595A-NINAB30

1.5.4 > Brazilian (ANATEL) regulatory notices

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.

Para maiores informações, consulte o site da ANATEL – http://www.anatel.gov.br

1.6 > Other recommendations

Potential safety conditions notice

If you notice any of the following conditions (or if you have other safety concerns), do not use the product: crackling, hissing, or popping sound, or a strong odor or smoke coming from the product. It is normal for these conditions to appear when an internal electronic component fails in a safe and controlled manner. However, these conditions may also indicate a potential safety issue. Do not assume it is a safe failure. Turn off the product, disconnect it from its power source, and contact technical support for assistance.

Disposal of waste equipment by users

This symbol means do not dispose of your product with your other household waste. Instead, you should protect human health and the environment by handing over your waste equipment to a designated collection point for the recycling of waste electrical and electronic equipment.

1.7 > Recommendations for terminal implementation

Every installation is unique. Sometimes the issues are well defined and can be handled in a standard fashion; sometimes the issues are very specific and may not be immediately recognizable.

IDEMIA recommends following steps for a successful installation:

Plan the installation - Choose the type of hardware required, decide if a network is required, and decide on the location and number of required terminals.

Unpack all items - Unpack all items and check against the packing list.

Install network hardware components - Install the cabling and components needed to run the system.

Install software - Install the software needed to set up the terminals.

Pre-configure device - Connect the terminals to the Ethernet, supply power to the terminals, and pre-configure the terminals.

Mount devices - Mount the terminals in their final locations

Power distribution and device hook up - Connect the terminals wiring via the back panel.

Power-up procedure - Check the power connections, and then start the system safely. First Boot Assistant screen is displayed, where you can perform **fundamental** configuration.

To secure properly an access, IDEMIA recommends installing the Morpho*Wave* XP₂ terminal as a part of the typical Access Control environment described in the figure below.
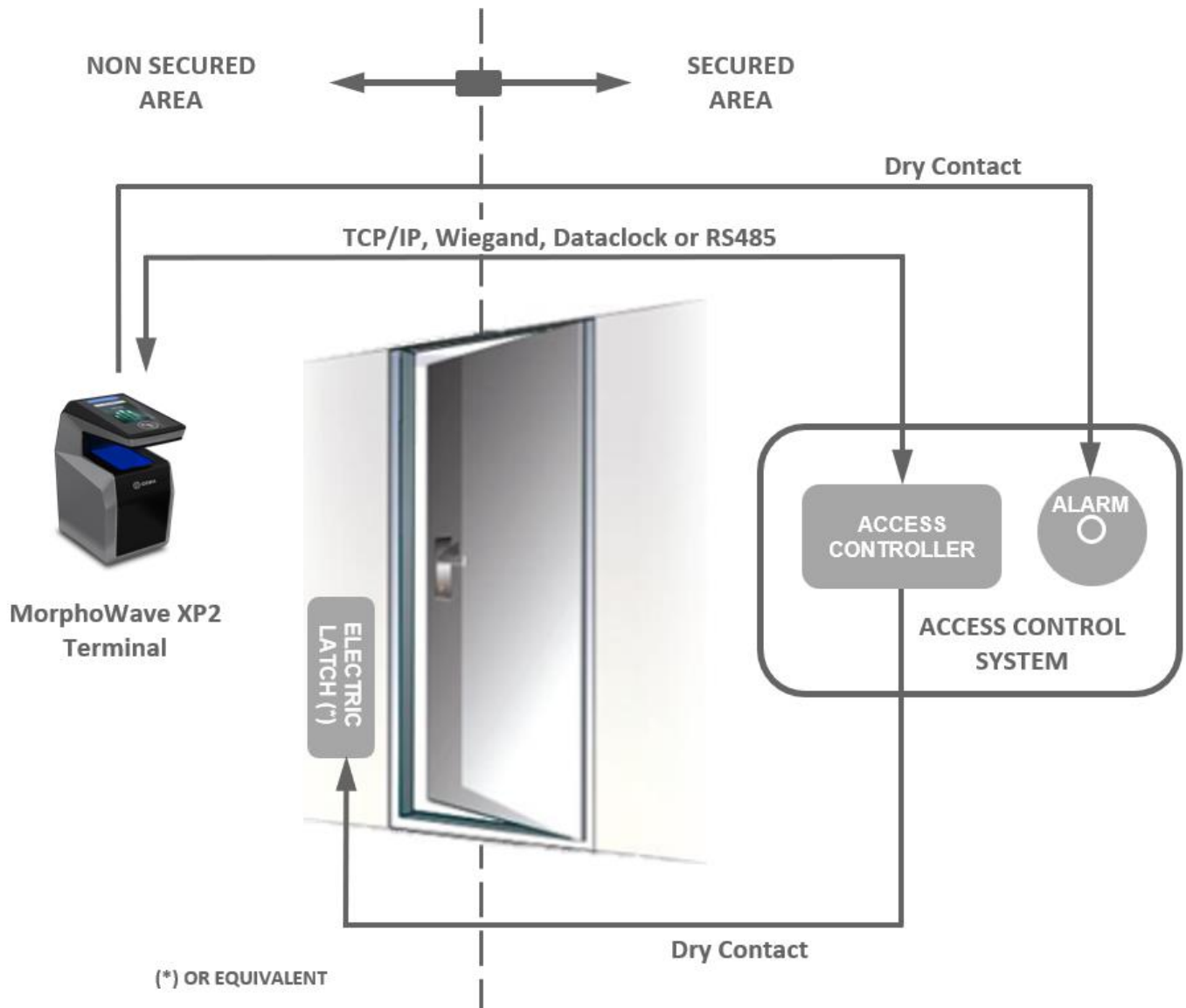
Figure 2: Implementation Recommendations

This environment comprises:

The Morpho*Wave* XP2 *terminal itself*

Its role is to perform one-to-many biometric identification or one-to-one biometric verification, i.e. to identify the individual who is swiping his/her hand across the terminal sensor by comparing his/her biometric data with the references previously stored in the terminal database (in the form of biometric templates) or to verify his/her identity using the reference stored in a contactless card presented to the terminal.

An Access Controller (3rd party product)

The Controller is the element which controls the access rights of the individuals to the secured area. For that reason, it must be located in the secured area.

The individuals who are authorized to access the secured area have their User ID listed in a so-called "Authorized User List" (in contrast with a banned card list).

The Morpho*Wave* XP₂ terminal and the Controller are communicating according to one of the TCP/IP, Wiegand, Dataclock or RS485 protocols:

The Morpho*Wave* XP₂ terminal sends User ID to the Controller

The Controller sends its decision to the Morpho*Wave* XP₂ terminal (which displays access granted or access denied depending on the answer)

The Morpho*Wave* XP₂ terminal sends an alarm signal to the Controller as soon as a malicious operation is detected (terminal pulled out from the wall or opened for maintenance operations); refer the paragraph dealing with anti-pulling and anti-tamper switches for more explanations.

The Controller is part of the global Access Control System of the secured area, which can provide useful features such as manage:

Authorized user lists (i.e. for VIP),

Banned card lists (i.e. for lost user cards),

An access request log (who and when, access granted or denied...),

An event log (i.e. tamper detection, access control for evacuation of the building...).

The Morpho*Wave* XP₂ terminal is able to work alone, without Controller, but the protection level of the secured area is lower.

An Alarm (3rd party product)

This element is connected to the Morpho*Wave* XP₂ terminal through a dry contact.

The Morpho*Wave* XP₂ terminal sends the command to activate the Alarm as soon as a malicious operation (terminal pulled out from the wall or having its bottom cover opened out of maintenance operations) is detected; refer the paragraph dealing with anti-pulling and anti-tamper switches for more explanations.

A Door Electric Latch or equivalent (3rd party product)

This element once activated opens the access. The Controller is the one which sends the command to activate the latch if access is granted (i.e. if the individual's User ID is listed in the Controller Authorized User List). Connection between these two elements is done through a dry contact.

2 / General description

(IDEMIA logo)

2.1 > Box opening

At the box opening, components shall be extracted from the protection casing as depicted in the pictures below.

Extract the wall plate (which is not screwed to the terminal) and keep it separate until the installation of the terminal is completed. The screwing of the product to the wall plate is the last stage of the installation.
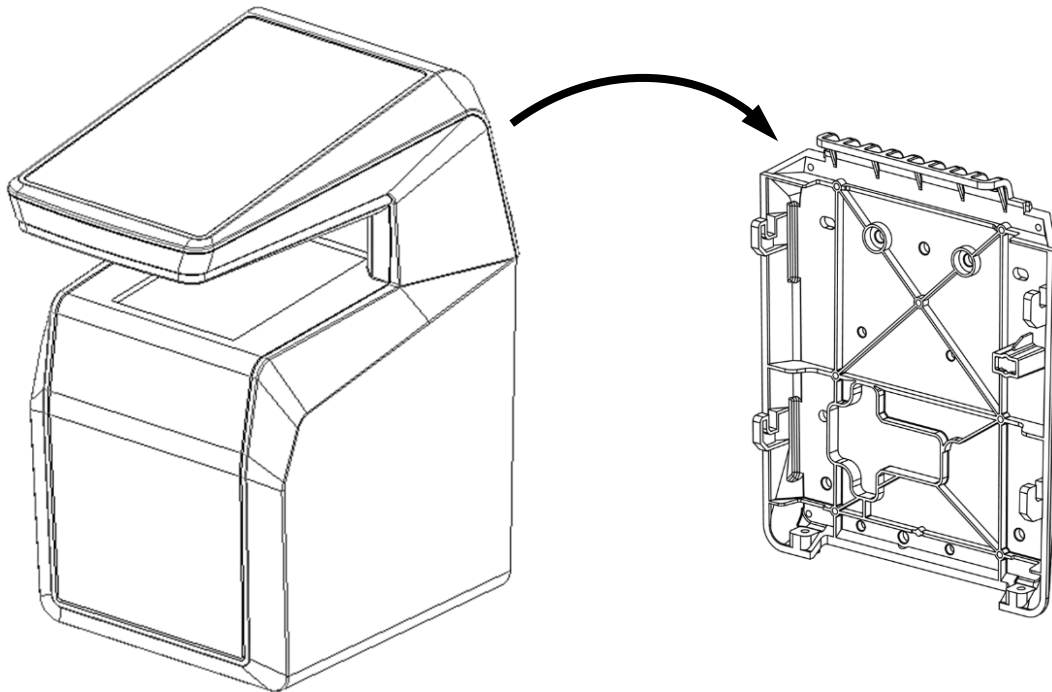
Figure 3: Box Opening

2.2 > Components of the initial package

1. One (1) Terminal's body
2. One (1) Wall frame
3. Documentation package
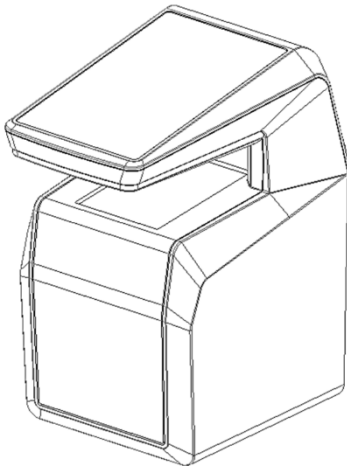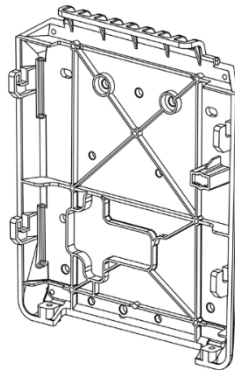
Terminal's body   Wall frame   Documentation package
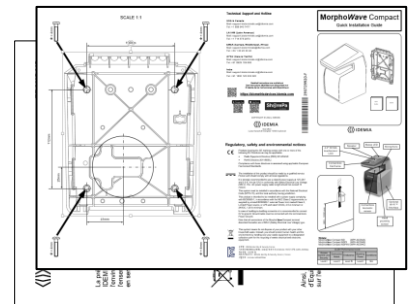
Figure 4: Box Content

2.3 > Terminal's front view description

BLE antenna

Speaker

Status LED

Contactless
Card area

4.3" WVGA
touchscreen LCD

Hand proximity
sensor

Contactless
biometric sensor

Figure 5: MorphoWave XP2 terminal front view

2.4 > Terminal's rear-view description

USB port (for configuration and maintenance)

Power supply, Relay, Tamper switch

GPIOs

RS485

Wiegand

RJ45
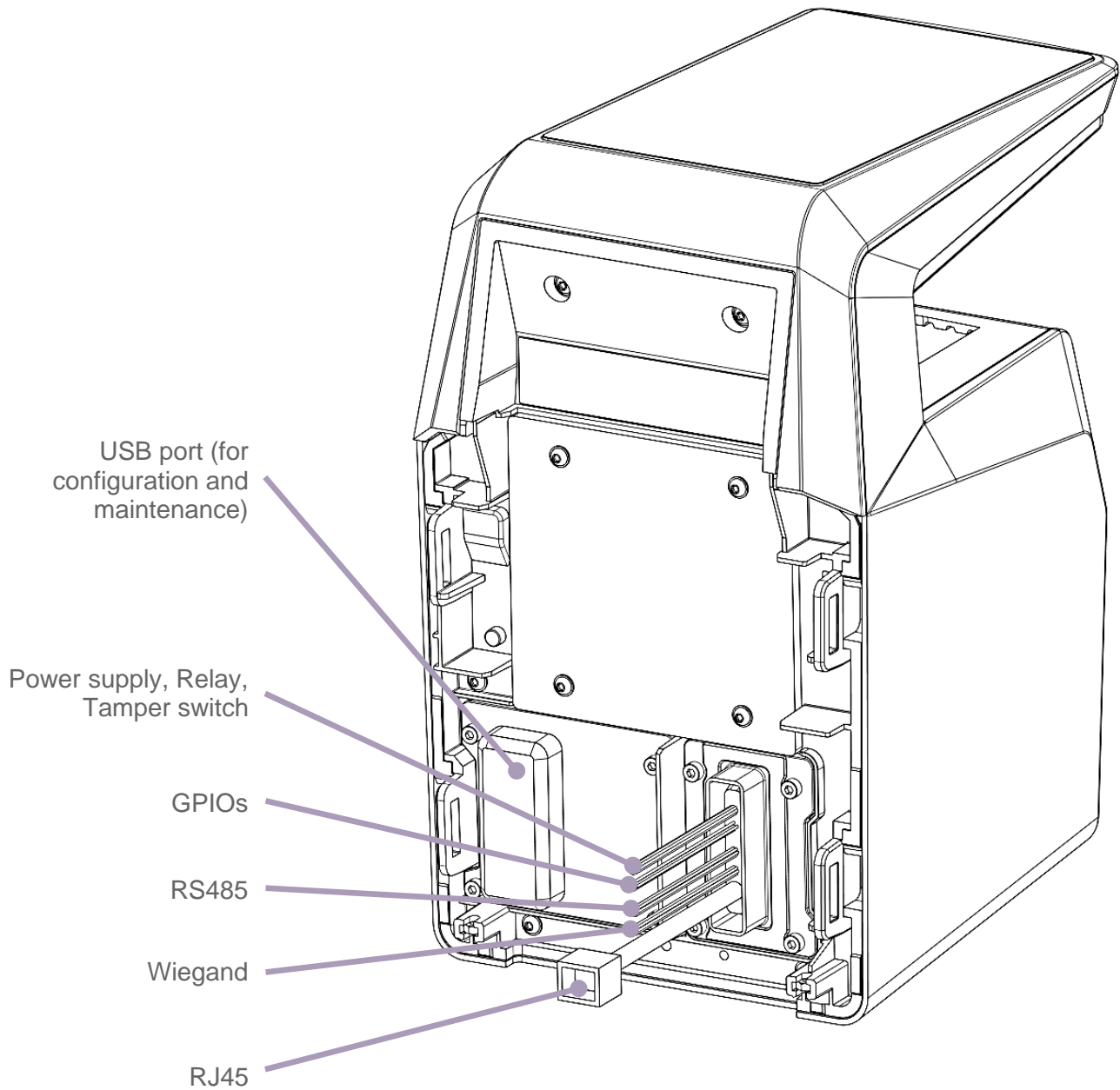
Figure 6: MorphoWave XP2 **terminal rear-view**

2.5 > Morpho*Wave* XP2 Technical Characteristics

Item	Description
Access control modes	Identification (search for fingerprints in a local database)
	Authentication with contactless smartcard, with or without fingerprint check
	Multi-factor: identification or authentication
	Distant commands: the access control check is fully driven by a remote system
Man Machine Interface	4.3" WVGA color capacitive Touchscreen
	Powerful Loudspeaker
Biometrics	Hand swipe through the active volume without contact:
	40 x 25 x 80 mm (WxHxD) capture volume
	(1.57" x 0.98" x 3.14")
	0.5 m/s (19.7 in/s) maximum hand speed
	Up to 4 fingers capture capacity per swipe motion
	False Acceptance Rate (FAR) adjustable from 1% down to 10^{-7}%
	Database capacity: 40 000 users (standard) and up to 100 000 users (with specific license)
Log capacity	1 000 000
LAN connection	For terminal configuration and data transfer:
	Ethernet 10/100 Base T (MDI, MDI-X)
	TLS protocol
	Note: for UL compliance, the connection is for supplemental use only and is not evaluated by UL
RFID cards	MIFARE® Classic 1KB & 4KB (4b and 7b UID)
	MIFARE® Plus cards
	DESFire® EV0 (first generation of DESFire cards, 3DES only)
	DESFire® EV1 (3DES and AES)
	DESFire® EV2 (3DES and AES)
	SmartMX® (dual technology Mifare® and DESFire®)
	HID® iClass® cards (with specific licence): iClass® legacy, iClass® SR, iClass SE
	HID® Seos™ (with specific licence)

HID Mobile Credential (with specific license)	BLE (version: 4.2 or higher) and NFC (including on iOS using Apple Wallet) Mobile device app: HID Mobile Access® version 3.3.1 or higher List of compatible mobile devices: HID Mobile Access® - Compatible Devices | HID Global
Radio frequency characteristics	Frequencies and magnetic fields or RF output power: - 13.553 to 13.567 MHz: 10 dBµA/m max; - 2400 to 2483.5 MHz: 8 dBm max Not evaluated by UL
Serial port	The serial port supports WIEGAND, DATACLOCK (ISO2), RS485 protocols Note: only WIEGAND was evaluated by UL
GPIO	3 GPI, 3 GPO (not evaluated by UL)
Output relay switches	Access granted: 1 switch two outputs (normally "open" and normally "closed") 30V – 1A max (Resistive loads, 100 000 cycles)
USB host port	Terminal configuration through a USB mass storage key Not evaluated by UL
Input signals	LED1/LED2 to activate the access granted relay
Power supply	12 to 24 V DC power supply (2.5A min @12V, 1.25A min @24V) Or PoE+ 42.5 - 57V, 25.5W Note for UL 294 Compliance power supply shall be UL 294 and UL 294B with power limited output
Security of the terminal	Anti-tamper-pulling switches Tamper-pulling detection: one switch closed when product wall mounted, open when pulled out
Size and weight	W x H x D: 152 mm x 250 mm x 220 mm (6.98" x 9.84" x 8.66") Weight: ~ 2 kg
Environmental conditions	Operating temperature: -10 °C to + 55 °C (14°F to 131°F) when ECO-mode is ON -10 °C to + 45 °C (14°F to 113°F) when ECO-mode is OFF Operating humidity 10 % < RH < 80 % (non condensing)

	Storage temperature -25 °C to + 70 °C (-13°F to 158°F)
	Storage humidity 5% < RH < 95 %
	IP65 rated

For UL 294 compliance, the products are rated for indoor use. IP65 was not verified by UL |
| | The terminal should be installed in controlled lighting conditions

Avoid direct exposure to sunlight or to UV lights |

3 / Installation procedure

3.1 > Before proceeding to the installation

Make sure that you have all the components described in "Components of the initial package" section at your disposal.

Remove the wall plate. Keep this element at hand.
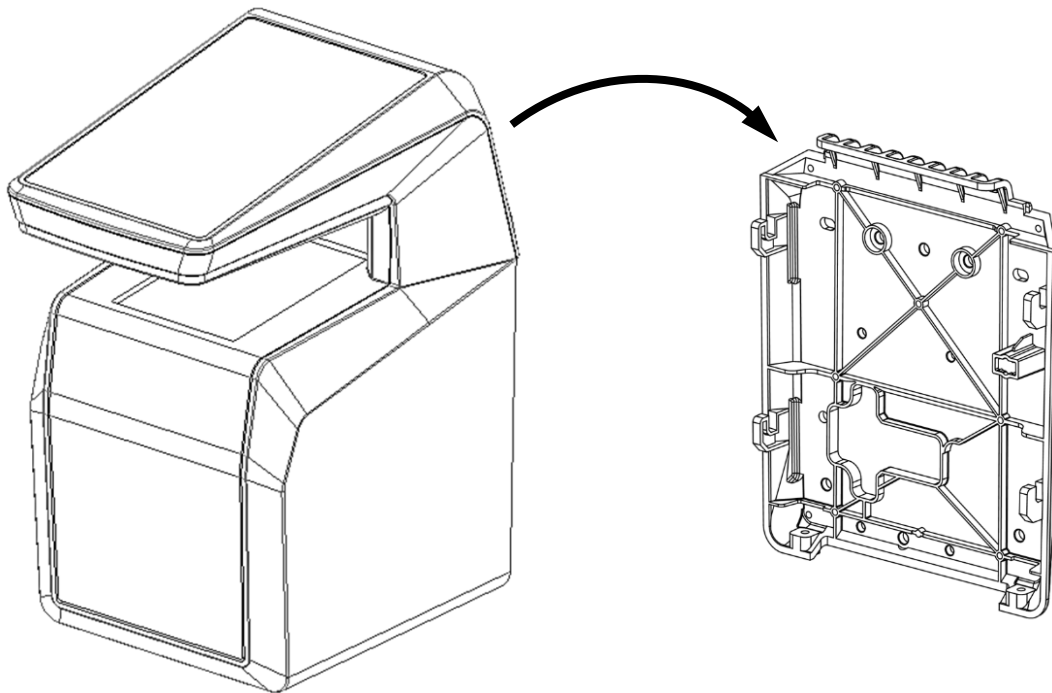
Figure 7: Removing wall frame

It is then possible to fix the terminal on the wall.

For an optimal use, the terminal must be installed in an area where the lighting conditions are controlled. Avoid direct exposure of the sensor to the sun light and ensure good ambient lighting for face detection if used.

3.2 > Installation

Required tools (not supplied)

Four (4) raw plugs + four (4) screws ø4mm max and length adapted to the wall material.

One (1) screwdriver adapted to screws above.

One (1) Drill (with a drill bit diameter adapted to raw plugs above).

One (1) hole saw (depending on installation case).

A (1) CHC H2 screwdriver

A (1) CHC H2.5 screwdriver

Deadbolt/door strike

Snubber diode required to protect regulated DC power supply from inductive kickback (1N4007 diode or equivalent recommended)

Separate power supply for the deadbolt/door strike based on supplier's recommendations.

External relay (if required)

Networking cable

For UL-294 compliance, an earthed screen in the wire or around all wires to/from product is only required when the wires share space/compartment/tube with high voltage cables.

Equipment from the initial package to use

One (1) Terminal's body.

One (1) wall plate.

3.3 > Step by step procedure
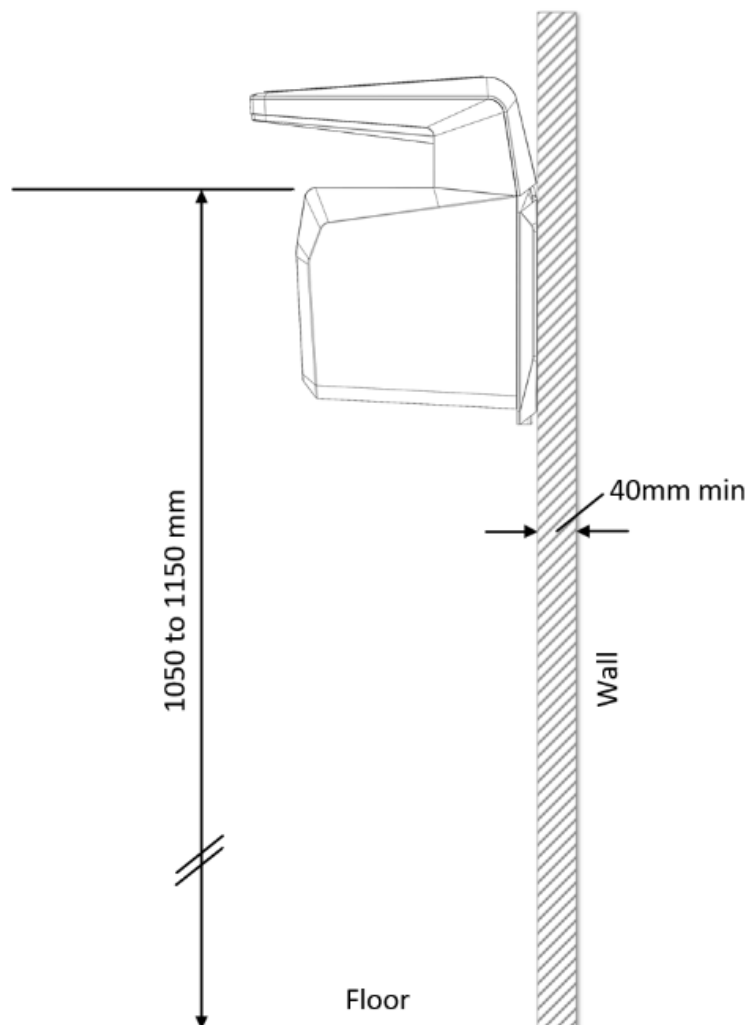
Figure 8: Face camera viewing angle

The recommended height for fixing of the terminal is 1.05 to 1.15 m (height of the acquisition glass).

For an optimal use, the terminal must be installed in an area where the lighting conditions are controlled. Avoid direct exposure of the sensor to the sun light.

Power supply from electrical source shall be switched off before starting the installation.

The strength of the attachment depends on the solidity of the wall on which the terminal is mounted.

3.3.1 > Drill the mounting holes

> *Be sure that the wall behind the wall plate has a good flatness.*
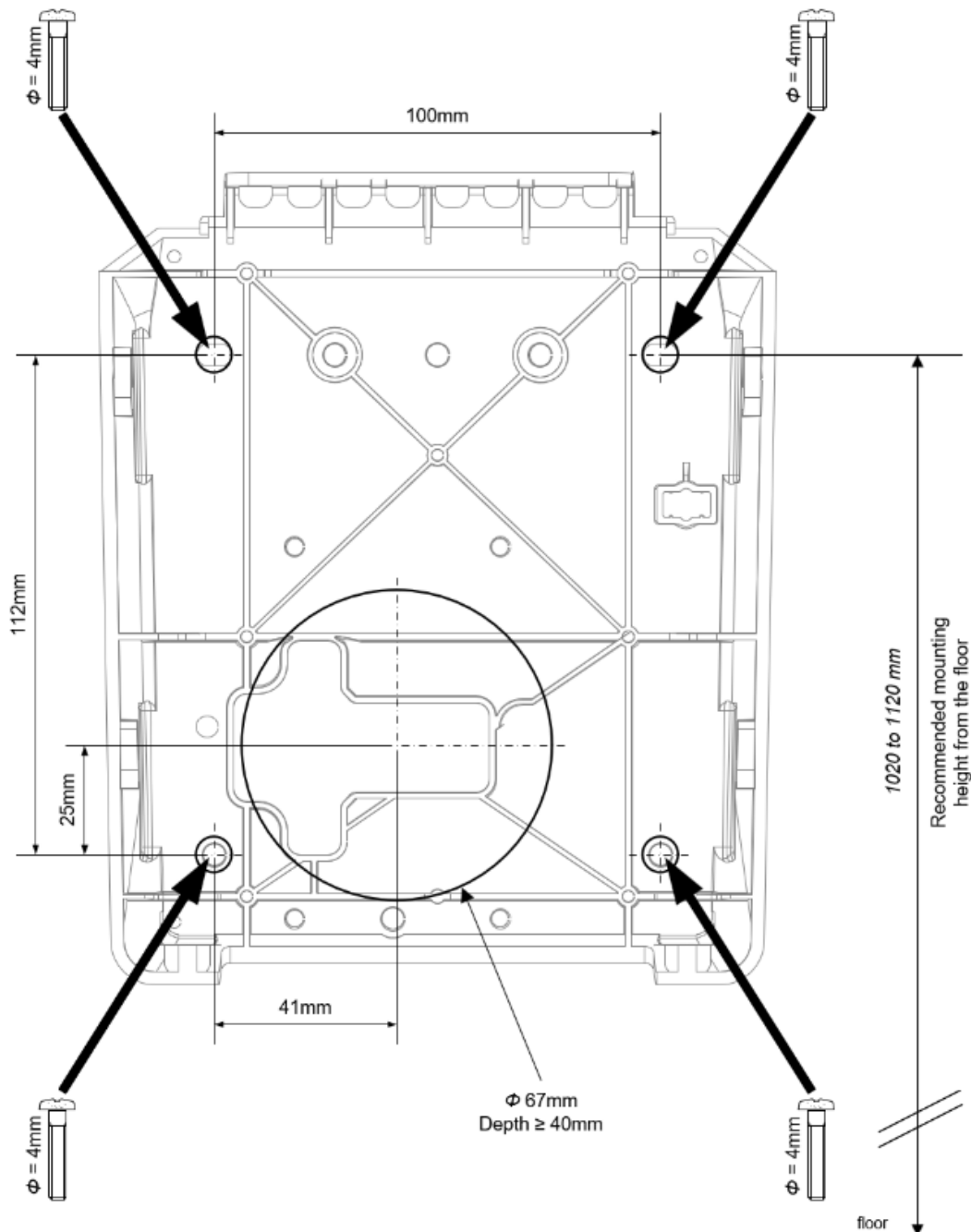
Figure 9: Drilling template

If not present, drill in the wall a hole with a diameter adapted to the width of the terminal and the cable to be hosted in (see Figure 9: Drilling template. This template can be found in the Quick Installation Guide).

The 67 mm diameter hole (cf. drilling template) should be at least 40 mm deep to fit the connections and cables. A deeper hole is recommended, if possible, to make the connection process easier.

Confirm the presence inside the hole of all the cables needed for the electrical installation.

Drill in the wall 4 holes with a diameter adapted to screws and fit them with the raw plugs (see Figure 9: Drilling template).

Be sure that a sufficient space is reserved in the wall for the passage of cables, in particular for Ethernet.

![IDEMIA logo]

3.3.2 > Make the connections

Unscrew the connector from the device:
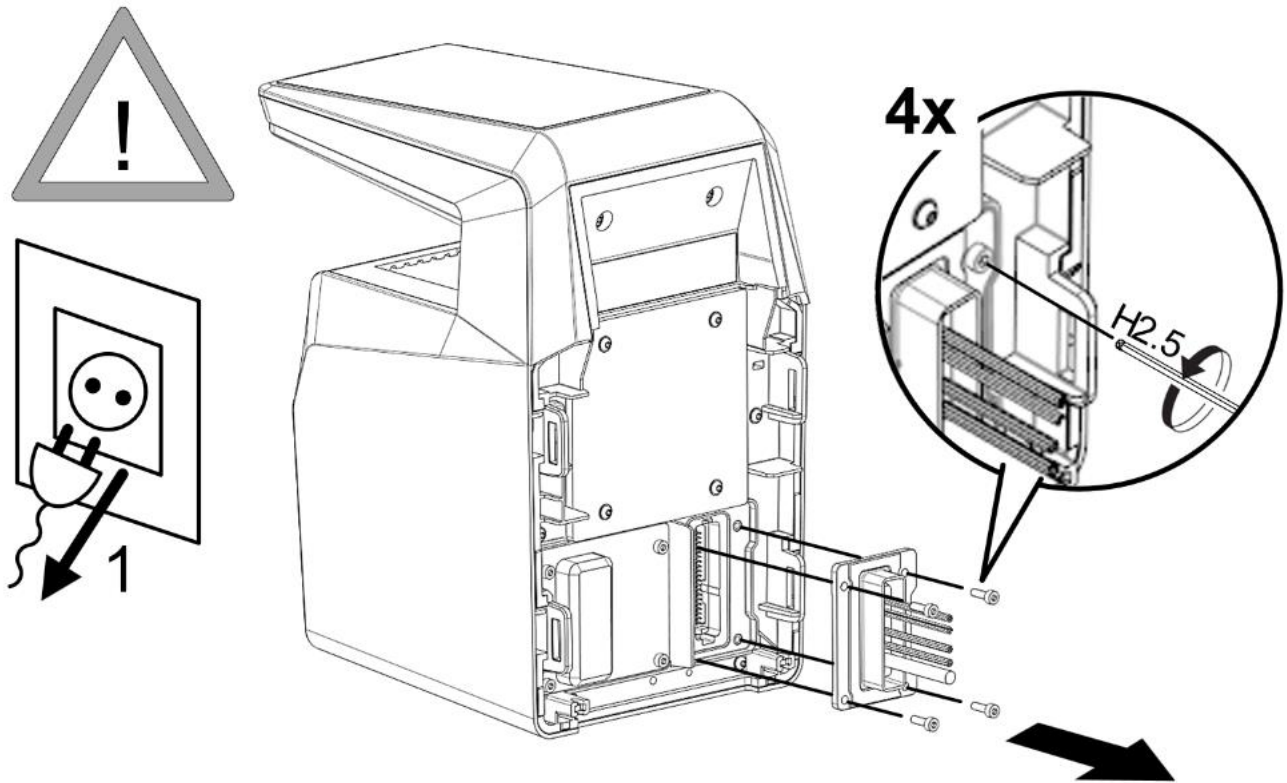
Figure 10: Connection - Step 1

Fit the cables through the mounting plate:
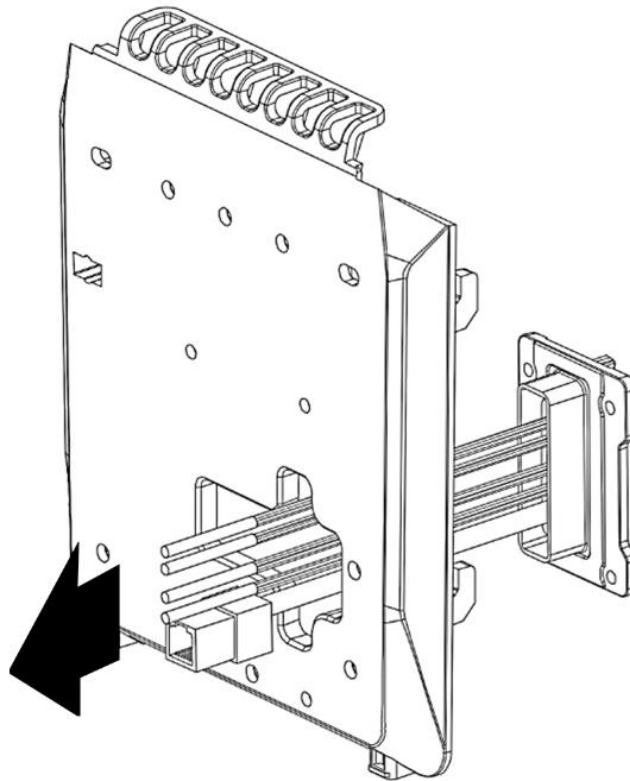
Figure 11: Connection - Step 2

Then connect the cables:
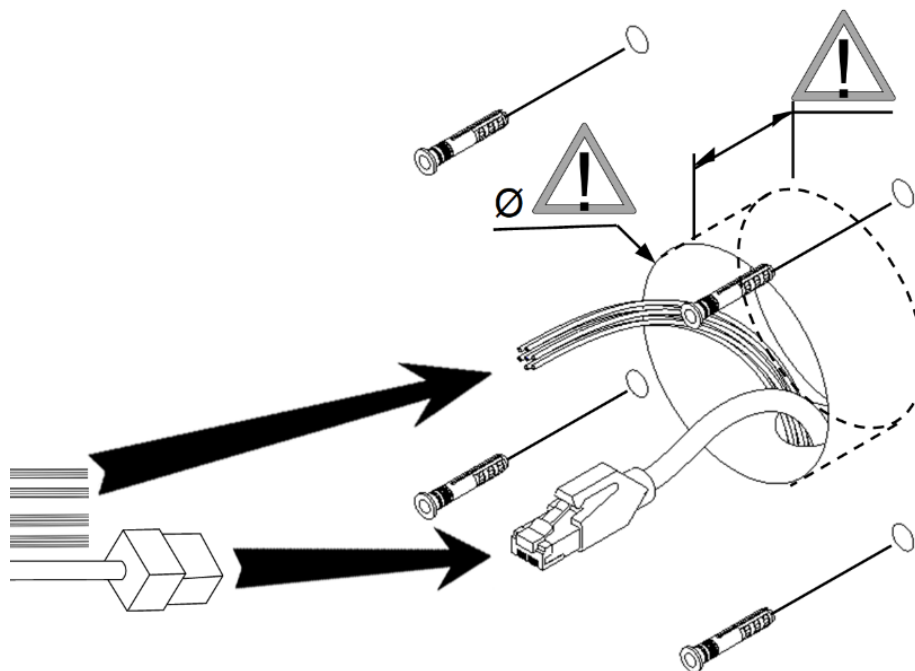
Figure 12: Drilling template and cable connection

Before cabling the product, remove the connector by cutting cables in the middle of heat shrink tube. Please refer to section 4 / for explanations of how cables/wires should be connected, according to wire color code.
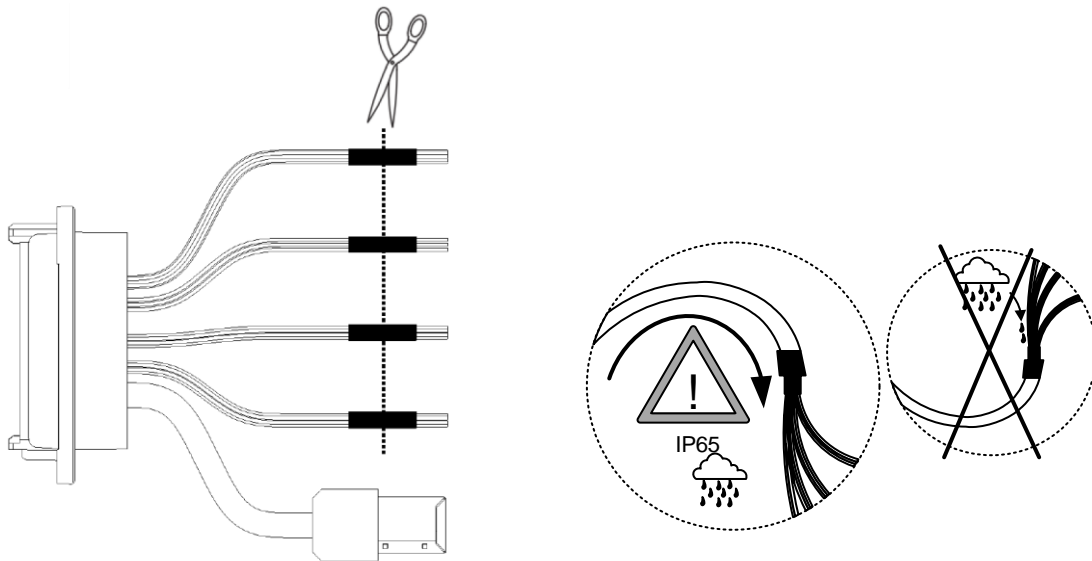
Figure 13: Cable preparation: cable position for water tightness

Cable for wiring shall be AWG 20 to 24, length shall be adapted to the size of the hole in the wall, to terminal connections, and to the distance between the electric source and the terminal itself.

For power supply, IDEMIA recommends using a 24V power supply and AWG16 gauge cable.

 To ensure water tightness, be sure to bend the cable downward.

For test purpose, it is possible to use the existing connector without cutting it. This connector mates with Molex PCB header reference 5016452620. The pinout of this connector is described in this document in section 4 /.
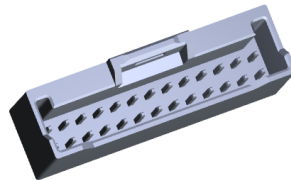
 The pinout indications that you can see on the labels of the cable shall NOT be taken into account as they correspond to the OTHER connector on the device side. Please use only the pinout information given in this document in section 4 /.

3.3.3 > Attach the base plate on the wall

Fix the base plate on the wall with the 4 screws.
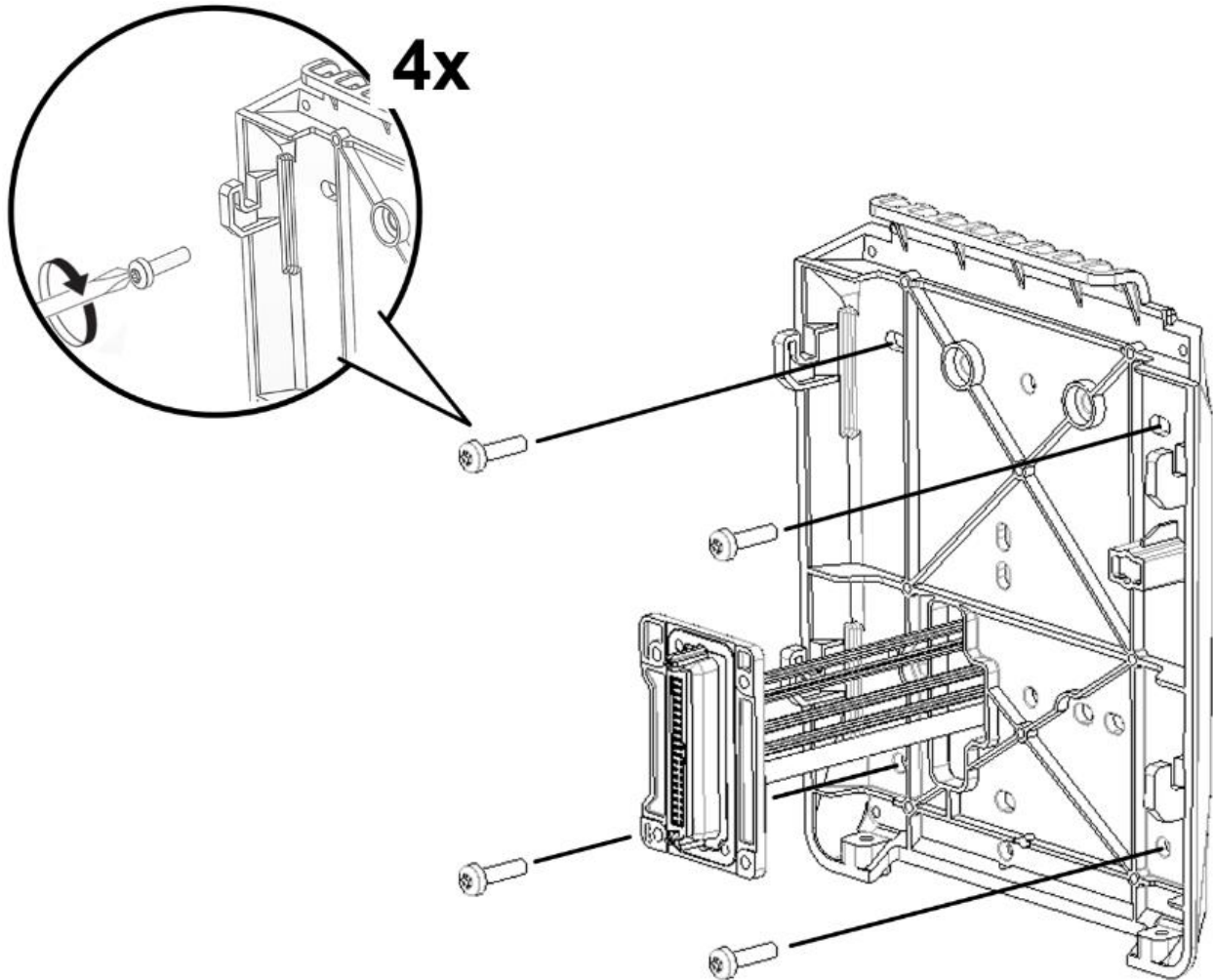
Figure 14: Base plate fixation on the wall

3.3.4 > Attach the device on the base plate
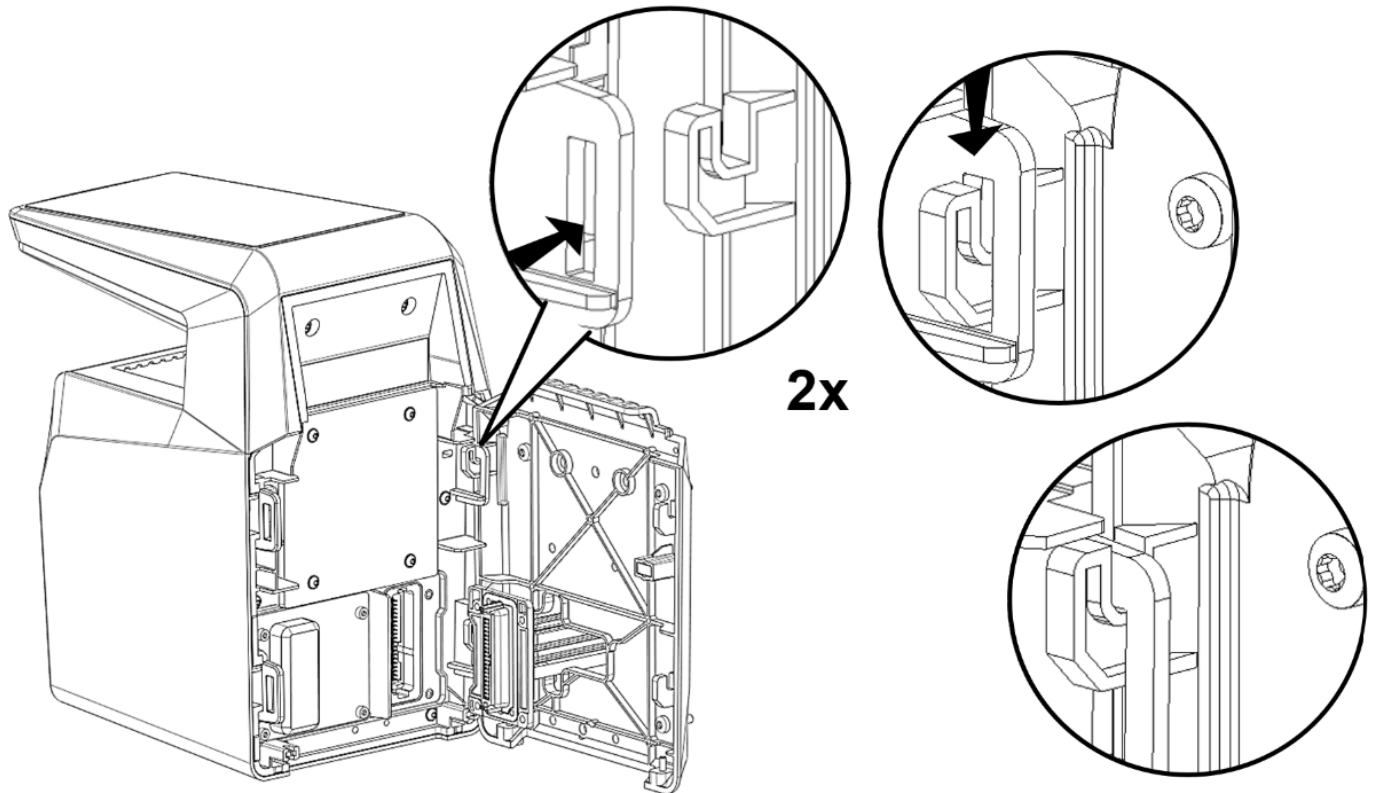
Figure 15: Base plate attachment on the device

3.3.5 > Connect the connector assembly on the device

Attach the connector assembly on the device with the 4 screws.
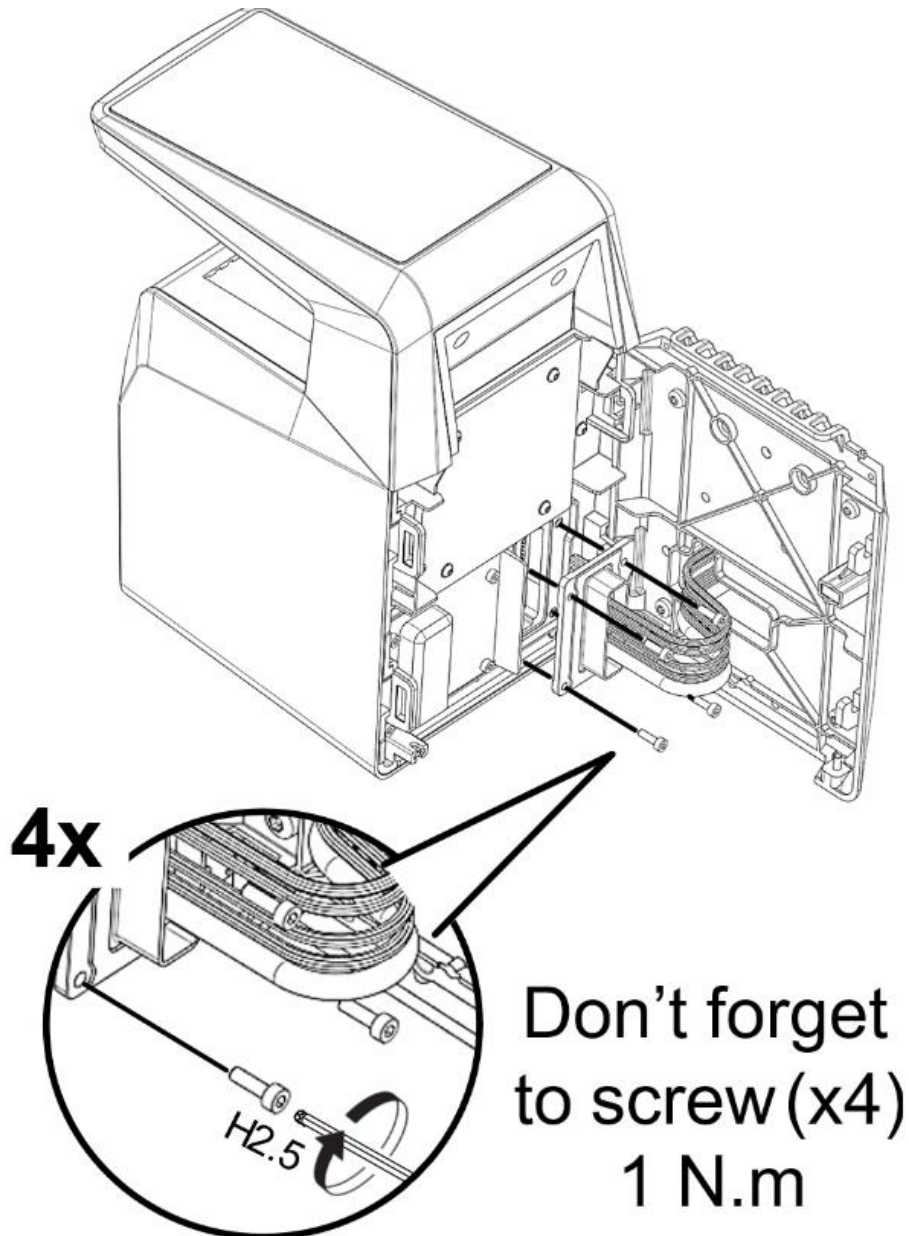
Figure 16: Connector assembly on the device

3.3.6 > Close the device on the base plate

Detach the device from the plate: first lift the device upwards, then pull it towards you, and hold it.
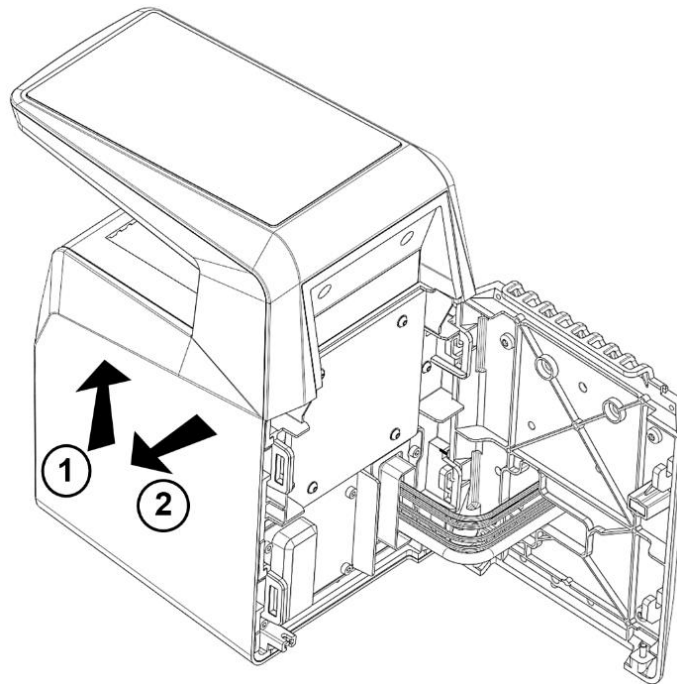
Figure 17: Product closure

Do not try to turn the product directly while it is attached on the base plate, as this would definitely damage the plate and the device!

Then rotate the device 90° to align it in the final position in front of the plate. Push the device towards the wall, then downwards until the device is locked on the plate.
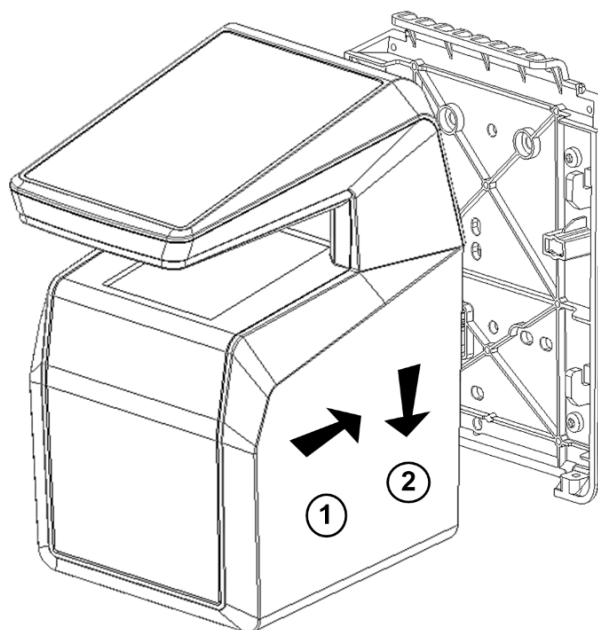
Figure 18: Product fixation on wall frame

Then to secure the device on the plate, attach the last screws on the bottom of the device:
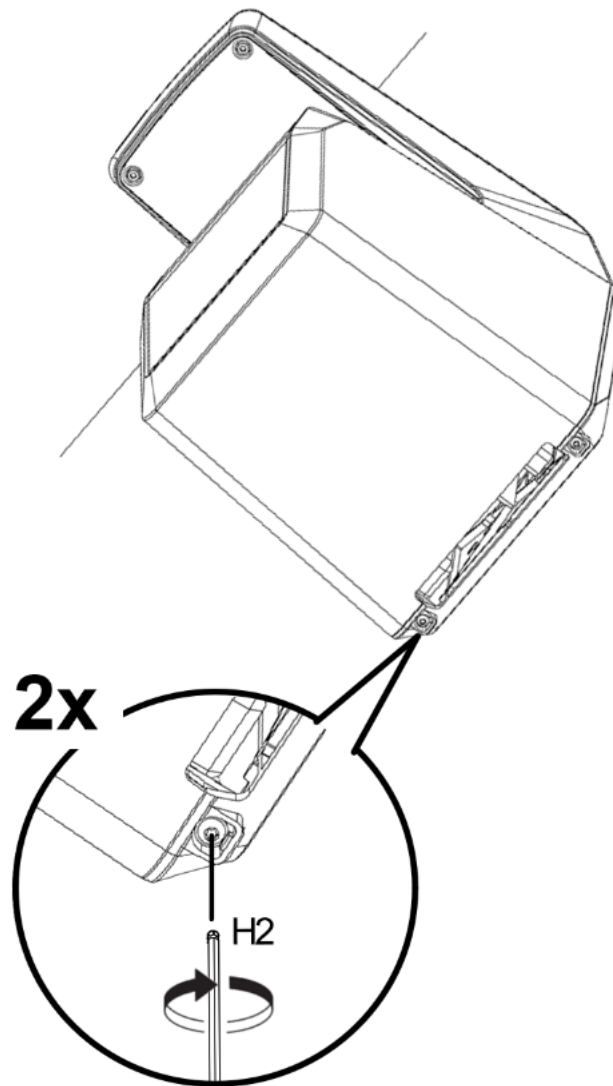
Figure 19: Locking the product

The hardware installation of the product on the wall is complete!

Power can be switched ON just after closing it. If the product must be stored for a long time (more than 48 hours), don't forget to restore its configuration before use.

4 / Electrical interface

4.1 > Wiring overview

![Warning icon] *Before proceeding, make sure that the person in charge of installation and connections is properly connected to earth, in order to prevent Electrostatic Discharges (ESD).*

![Warning icon] *Power supply ground shall not be used for peripheral ground. All other grounds can be used indifferently.*

Note that all connections of the Morpho*Wave* XP2 terminal described hereafter are of SELV (Safety Electrical Low Voltage) type.

13	RLY_NC	Orange / White
14	RLY_NO	Yellow / White
12	RLY_COM	Grey / White
5	SWITCH_PIN1	Light Blue
6	SWITCH_PIN2	Pink
1-3	Power +12V	Red
2-4	Power GND	Black

7	RS485_RX_A	Blue / Black
8	RS485_TX_Z	Green / White
9	RS485_RX_B	Blue / White
10	RS485_TX_Y	Green / Black
11	RS485_GND	Black / Red

19	GPI2	Orange / Black
20	GPO2	Yellow / Black
17	GPI1	Orange / Red
18	GPO1	Yellow / Red
15	GPI0	Orange
16	GPO0	Yellow
22	GPIO_GND	Black / Red

25	WIEGAND_LEDOUT1	Blue
28	WIEGAND_LEDOUT2	Blue / Red
23	WIEGAND_IN1	White / Red
24	WIEGAND_OUT0	Green
26	WIEGAND_OUT1	White
21	WIEGAND_IN0	Green / Red
27	WIEGAND_GND	Black / Red

36	BI_DA+	Orange / White	1
34	BI_DA-	Orange	2
40	BI_DB+	Green / White	3
38	BI_DB-	Green	6
35	BI_DC+	Blue	4
33	BI_DC-	Blue / White	5
39	BI_DD+	Brown / White	7
37	BI_DD-	Brown	8
31	BI_GND	Drain wire (no color)	Shell

Figure 20: Cabling layout

4.2 > Power Supply

PoE+ and external power supply are not used at the same time: if both power supplies are used, priority is given to external power supply. If external power supply is shut down, switch to PoE+ without reboot is not guaranteed.

External Power supply
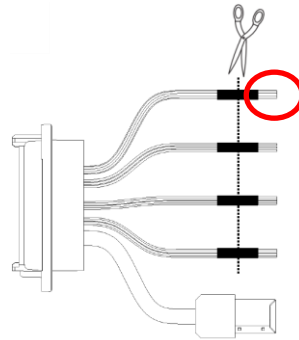
1-3	Red	Power Supply 12-24V DC	In	Positive 12-24 Volts, power supply
2-4	Black	Power ground	In	Ground power supply

Figure 21: Power supply wiring

The External power supply

Must comply with IEC 60950-1 standard marked Class 2, Limited Power source (LPS)

12V to 24V DC (regulated and filtered) 2.5 Amp min at 12V.

If sharing power between devices, each unit must receive 2.5A (e.g. two units would require a 12vDC, 5A supply).

IDEMIA recommends using a 24V power supply and AWG16 gauge cable. The voltage measured on the product block connector of the terminal must be equal to 12V-24V (-15% / +10%).

The voltage drop due to the cable shall be taken into account. The table below shows as an example the maximum distance between power supply and one (1) unique device, depending on cable gauge and power supply rating.

Gauge AWG	Section (mm^2)	Maximum distance (meters) vs power source rating		
		12V+/-10%	12V+/-5%	24V+/-10%
16	1.31	9 m	20 m	300 m
18	0.82	6 m	12 m	200 m
20	0.52	3 m	8 m	120 m
22	0.32	2 m	5 m	75 m

If several terminals are powered by the same cable, make sure to select a wire gauge that complies with maximum voltage drop, cable length, and power source minimum voltage rating.

PoE+ (Power over Ethernet Plus)

Morpho*Wave* XP2 terminal's power supply can also be provided by the Ethernet using RJ45 connection (Power over Ethernet Plus mode - IEEE802.3at type 2 compliant).

The terminal may be powered via a UL 294B PSE PoE+ Limited power source (IEEE802.3at type 2 compliant).

> *If several terminals are powered through the same PoE+ switch, make sure the switch is capable of providing enough power to each device (25.5W).*

Please refer to "Using PoE+" recommendations section 7 / for more details about the best practices for powering the Morpho*Wave* XP2 terminals with PoE+.

4.3 > Output Relay
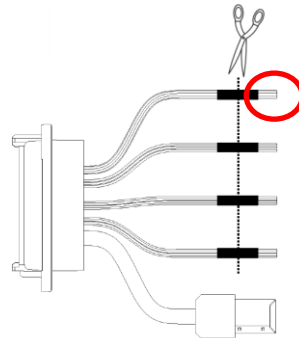
14	Yellow / White	RLY_NO	○→	Contact relay (normally open)
12	Grey / White	RLY_COM	○	Contact relay common
13	Orange / White	RLY_NC	●	Contact relay (normally closed)

Figure 22: Output relay wiring

Nominal characteristics of relay

Load characteristics:

1 A max @ 30 VDC (according to the safety extra low voltage requirements independently of the power supply),

Resistive load or inductive load; see warning information hereafter for inductive load,

The internal relay is designed for at least 100 000 cycles (resistive load).

⚠️ *Inductive load management requires a parallel diode for a better contact lifetime.*

Example of connection for electrical door locks
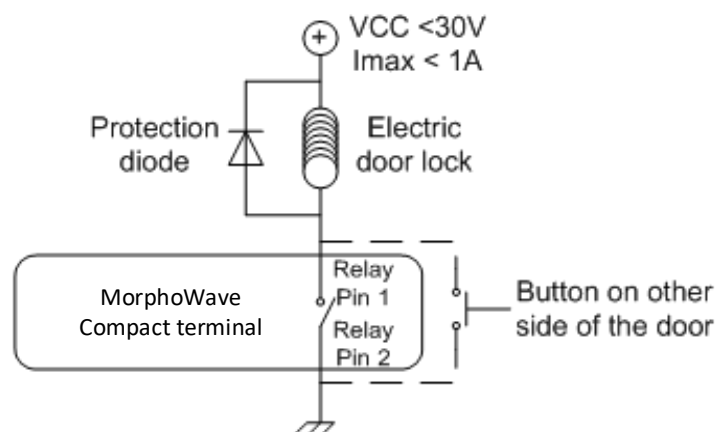
Figure 23: Example of electric latch connection

4.4 > Tamper Switch
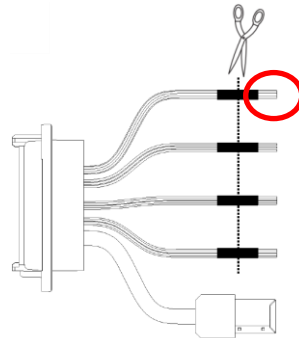
5	Light Blue	SWITCH_PIN1		Tamper switch contact
6	Pink	SWITCH_PIN2		Strip on tamper switch

Figure 24: Tamper switch wiring

Operating principle for the switch

Product installed on the wall plate: switch enabled (contact closed).

Product opened (rear connectors accessible): switch disabled (contact open).

Nominal characteristics of switch block

100 mA at 30 VDC max (Resistive load) according to the safety extra low voltage standard.

> *This* MorphoWave XP2 *terminal is part of security system; it is customer's responsibility to connect the tamper switch (contact) to physical access controller, in order to prevent the access to the connector blocks.*

4.5 > Wiegand wiring

Wiegand input
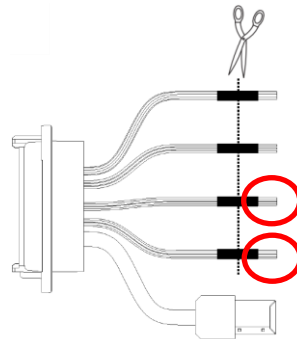
21	Green / Red	WIEGAND_IN0	In	Wiegand IN D0 (Output type required: Open drain or 5V+/-5%)
23	White / Red	WIEGAND_IN1	In	Wiegand IN D1 (Output type required: Open drain or 5V+/-5%)
16	Yellow	GPO0	Out	Wiegand LEDIN (typical = 5VDC) (option)
27	Black / Red	WIEGAND_GND		Ground for Wiegand

Figure 25: Wiegand input wiring

If pull-up's to 12V have been added on Wiegand IN D0 and Wiegand IN D1 inputs on a previous installation with a MorphoAccess® 500 Series terminal, these resistors must be removed to avoid any damage to the MorphoWave XP₂ terminal.

4.6 > Wiegand output

The following figure shows how to cable the wires of the serial port of the terminal for the Wiegand protocol
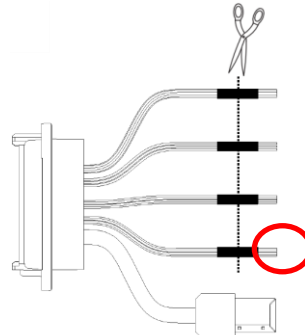
24	Green	WIEGAND _OUT0	Out	Wiegand OUT D0 (5V TTL)
26	White	WIEGAND _OUT1	Out	Wiegand OUT D1 (5V TTL)
25	Blue	WIEGAND_LEDOUT1	In	Wiegand LED IN 1 (option): panel feedback (Output type required: Open drain or 5V+/-5%)
28	Blue / Red	WIEGAND_LEDOUT2	In	Wiegand LED IN 2 (option): panel feedback (Output type required: Open drain or 5V+/-5%)
27	Black / Red	WIEGAND_GND		Ground for Wiegand

Figure 26: Wiegand output wiring

The use of LED1 and LED2 wires is described in the paragraphs below.

The controller supports neither LED1 nor LED2 signals

When the access controller has no relay contact to provide an answer to the Morpho*Wave* XP2 terminal, then the decision to emit either the "access granted" signal or the "access denied" signal is taken by another way. It is either the Morpho*Wave* XP2 terminal itself that decides, or it waits for the access controller answer through the local area network (TCP), or on the serial port in (RS485).

It is strongly recommended to disable the LED IN feature, to avoid any interference on Morpho*Wave* XP2 terminal behavior.

The controller supports only LED1 signal

When the access controller has only one relay contact which is dedicated to the "access granted" answer, this one must be connected between the LED1 and GND wires. The LED1 wire is set to the low level by closing the contact between the LED1 and the GND wires, and it means "access granted".

The Morpho*Wave* XP2 terminal uses the timeout of the wait for a low level on the on LED1 wire or LED2 wire as "access denied" answer.

To minimize at most the waiting time of the user, the Morpho*Wave* XP2 terminal timeout value, must be adjusted to a value a little bit higher than the maximal value of the controller response time.

Warning: if the LED2 wire is connected, it must be constantly maintained in the high state.

The controller supports LED1 and LED2 signals

When the controller supports one relay contact for each of the possible answers then:

The « access granted » contact must be connected between the LED1 and the GND wires of the terminal

The « access denied » contact must be connected between the LED2 and the GND wires of the terminal.

The Morpho*Wave* XP2 terminal considers that:

The answer of the controller is "access granted", when the controller puts the LED1 wire to the low state (by closing a contact between the LED1 and the GND wires), **and leaves the LED2 wire to the high state.**

The answer of the controller is "access denied", when the controller puts the LED2 wire to the low state (by closing a contact between the LED2 and the GND wires), **whatever is the state of the LED1 wire.**

The Morpho*Wave* XP2 terminal also considers that the answer of the controller is "access denied" in case of time-out while expecting for a closure between LED1 and GND wires, or between LED2 and GND wires.

4.7 > Serial port wiring

DataClock Input
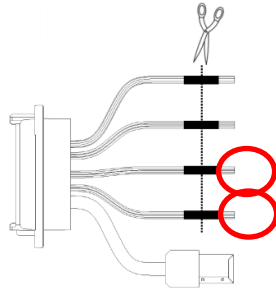
21	Green / Red	WIEGAND_IN0	In	Data (Output type required: Open drain only)
23	White / Red	WIEGAND_IN1	In	Clock (Output type required: Open drain only)
16	Yellow	GPO0	Out	Card present signal (if configured, only one selectable for Morpho Legacy)
27	Black / Red	WIEGAND_GND		Ground for Wiegand

Figure 27: Serial port wiring – DataClock Input

DataClock Output
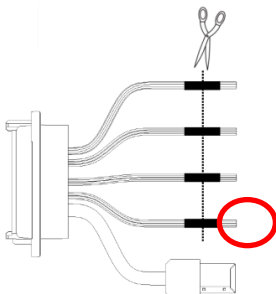
24	Green	WIEGAND _OUT0	Out	Data (5V TTL)
26	White	WIEGAND _OUT1	Out	Clock (5V TTL)
25	Blue	WIEGAND_LEDOUT1	In	LED IN 1 (option): panel feedback (Output type required: Open drain or 5V+/-5%)
28	Blue / Red	WIEGAND_LEDOUT2	In	LED IN 2 (option): panel feedback (Output type required: Open drain or 5V+/-5%)
27	Black / Red	WIEGAND_GND		Ground for Wiegand

Figure 28: Serial port wiring – DataClock Output

RS485
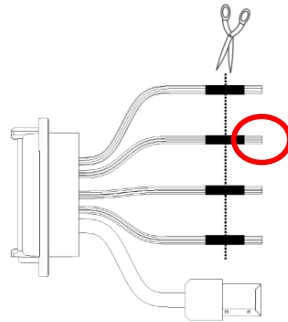
10	Green / Black	RS485_TX_Y	In/Out	RS485 Rx/Tx non inverting signal (A)
8	Green / White	RS485_TX_Z	In/Out	RS485 Rx/Tx inverting signal (B)
11	Black / Red	RS485_GND		Ground

Figure 29: Serial port wiring – RS485

RS485 implementation is limited to half-duplex communication. So only Tx+, Tx- and ground reference signals are necessary.

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

For farthest terminal, a 120-Ohms resistor termination may be added outside the terminal between TX+ and TX-.

4.8 > GPIO wiring
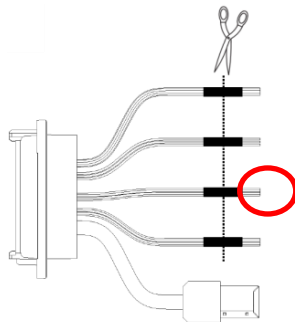
19	Orange / Black	GPI2	In	Digital Input (1,8V to 5V)
20	Yellow / Black	GPO2	Out	Digital Output (5V – 5mA max)
17	Orange / Red	GPI1	In	Digital Input (1,8V to 5V)
18	Yellow / Red	GPO1	Out	Digital Output (5V – 5mA max)
15	Orange	GPI0	In	Digital Input (1,8V to 5V)
16	Yellow	GPO0	Out	Digital Output (5V – 5mA max)
22	Black / Red	GPIO_GND		Ground

Figure 30: GPIO wiring

Single Door Access Control (SDAC) implementation
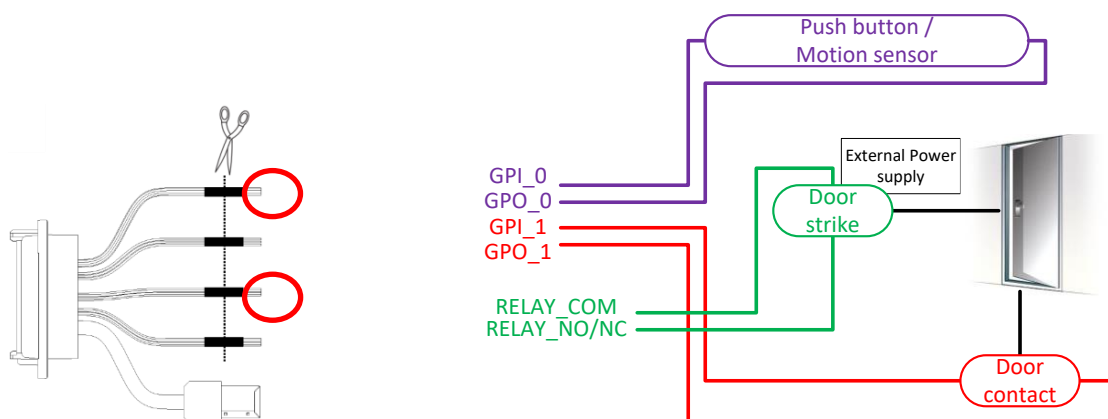
Figure 31: SDAC wiring

If door contact is not used, GPI1 and GPO1 shall be connected together

4.9 > Ethernet connection

Use a category 6 shielding cable (120 Ohms) or better. It is strongly recommended to insert a repeater unit every 90 m.

Recommendations for RJ45 wiring

Pin	1	2	3	4	5	6	7	8
Signals	Data pair 1	Data pair 1	Data pair 2	NC/POE pin dedicated (+)	NC/POE pin dedicated (+)	Data pair 2	Ground/ pin dedicated (-)	NC/POE pin dedicated (-)
EIA / TIA T568B Colors	White orange	Orange	White green	Blue	White blue	Green	White brown	Brown
EIA / TIA T568A Colors	White green	White green	White green	White green	White green	White green	White green	White green
Corel L120 Colors	Grey	White	Pink	Orange	Yellow	Blue	Purple	Brown
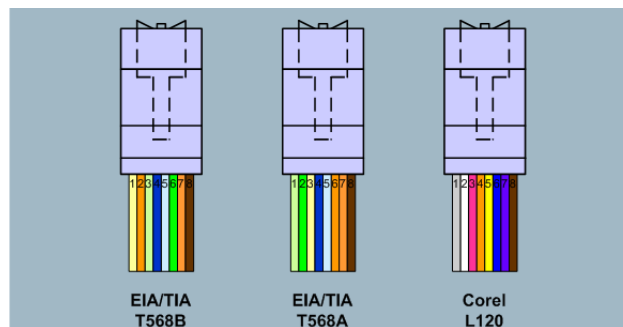
Figure 32: RJ45 wiring

RJ45 plug pinout is compliant with 10/100 base T, IEEE802.3 Specification. Product is compliant also with MDI or MDI-X.

 Ethernet cable shall be shielded

Ethernet interface can be used to power the Morpho*Wave* XP₂ terminal through PoE+ (Power Over Ethernet Plus - IEEE802.3at type 2 mode). According to the PoE+ standard two modes are available: power on data pins and power on dedicated pins.

Use either one of these modes depending on PoE+ implementation on your local Ethernet network.

Default Ethernet configuration

By default, Morpho*Wave* XP₂ terminal is configured in STATIC mode with the following configuration: IP Adress : 192.168.1.10; Gateway Adress : 192.168.1.254; Subnet Mask : 255.255.254.0

4.10 > Internal USB connection

Remove the 4 screws of the cover, as shown on the following drawing. Then remove the cover.
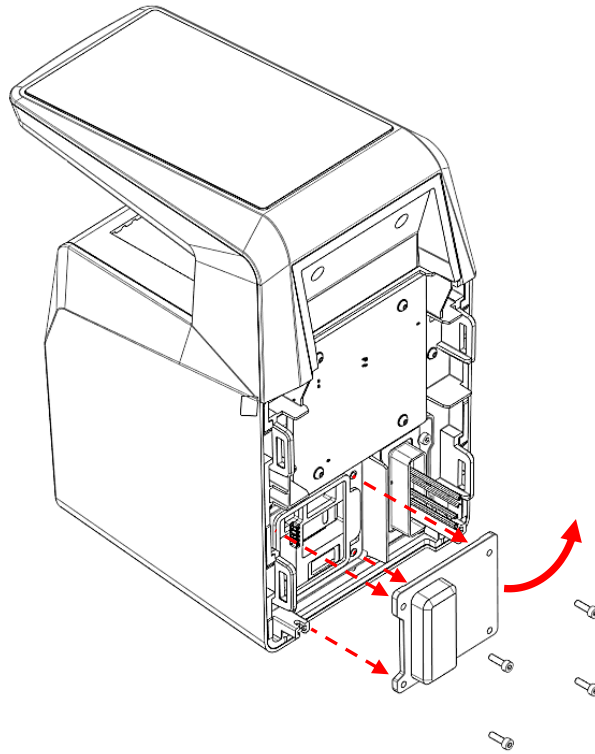
Figure 33: Cover removing

You can then see a Mini USB plug.

Mini USB type B
connector
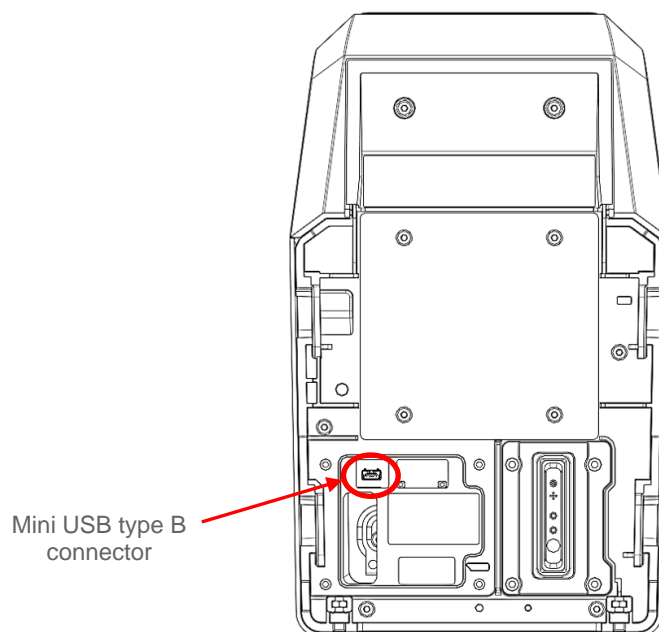
Figure 34: Internal USB connection

The internal Mini USB-type B can be used for administration only to connect a mass storage USB key (with a standard Mini USB-type B / USB-type A female OTG adapter).

Please refer to Morpho*Wave* XP₂ Administration Guide for more information.

USB connection is limited to USB key connection (power consumption shall not exceed 200mA)

5 / User interface

5.1 > Modes for controlling access rights

5.1.1 > Introduction

The Morpho*Wave* XP2 terminal offers several methods for controlling access rights: it needs to be configured in one of the following four modes:

Identification mode,

Authentication mode,

Multi-factor mode,

Distant commands mode

Refer to Morpho*Wave* XP2 Administration Guide for more information on Access Control.

5.1.2 > Identification mode

The Identification process of the Morpho*Wave* XP2 terminal proceeds by comparison of the biometric data of the hand swiped across the biometric sensor, with all the biometric data stored in the database.

It means that the biometric data of the allowed users must be stored in the internal database before they can request the access on the terminal. This biometric data is acquired either directly on the terminal (using the embedded firmware), or on an enrolment system using the same type of biometric sensor.

The access control by identification process is started when a finger is detected on the biometric sensor

When the user requests the access, his/her identity is unknown, and it is the terminal that searches for his/her identity. The terminal grants the access if a match is found (the user is identified); otherwise, the access is denied (the user remains unknown).

For further information, please see the "Identification mode" section in the Morpho*Wave* XP2 Administration Guide.

5.1.3 > Authentication (verification) mode

Unlike the "identification" mode, the user identity must be known in order to execute the authentication process.

Indeed, authentication is an identity verification process: the user provides his/her identity and the terminal checks it with the relevant process.

This mode doesn't compare the user's data to the data of several users: it compares the data provided by the user with the reference data provided by the same user during enrollment phase. The data can be on a card presented to the terminal or in a database and ID is provided by the user.

Access is authorized if the terminal finds a correspondence.

For further information, please see the "Authentication mode" section in the Morpho*Wave* XP2 Administration Guide.

5.1.4 > Multi-factor mode

In this mode, the "identification" and "authentication" modes are available simultaneously; the user decides which control method will be used:

by swiping his/her hand across the sensor, thereby triggering the identification process,

by placing his/her contactless card or mobile device on the reader, thereby triggering the authentication process,

This is the default mode for terminals fitted with a contactless smartcard reader.

For further information, please see the "Multi-factors method" section in the Morpho*Wave* XP₂ Administration Guide.

5.1.5 > Distant commands mode

The Distant command mode is an operating mode where the access control main application is located in a distant system. This is not a standalone mode like Identification and Authentication modes.

It means that the terminal becomes a slave of the host system application. The access control application is running on the host system and uses Morpho*Wave* XP₂ terminal high level functions:

Identification function

Authentication function

Read data on a contactless card

Access control result signal command

The Morpho*Wave* XP₂ terminal is driven through an Ethernet link using TCP, SSL or TLS protocol.

The Morpho*Wave* XP₂ terminal acts as a server: it is either waiting for a command or executing a command.

The commands allowed by the Morpho*Wave* XP₂ terminal are described in the Morpho*Wave* XP₂ Host System Interface Specification document.

For further details about SSL or TLS on the Morpho*Wave* XP₂ terminal, please refer to the Morpho*Wave* XP₂ Administration Guide.

5.1.6 > External database mode (also called polling mode)

When external database mode is activated, the Morpho*Wave* XP2 terminal does not verify user template in its local database. This mode is useful when the user templates are stored in an external database.

When authentication is initiated on the terminal, the terminal will poll the user ID to external controller. On polling out the ID, the corresponding template (if any) is fetched from the external database and is authenticated against user's biometric on the terminal. Once the template request is posted to the external database, the terminal shall wait for the finger template from the external database to start authentication. Further process shall be same as authentication.

Polling Process using buffer:

The user's input ID will be queued in the terminal's queue, which is polled by external application.

External application waits for the User ID by polling the buffer. After getting an ID, it will search the template in database and send template to terminal for further authentication.

The user is authenticated by the external device and granted access accordingly.

Morpho*Wave* XP2 terminal also has distant commands to retrieve polling buffer status and polling buffer data. Refer to the Morpho*Wave* XP2 Host System Interface Specification document.

How to Activate?

External database mode can be activated by setting "ucc.enable_external_database" parameter to 1. Only an admin user can activate polling mode. You can refer to the Morpho*Wave* XP2 Host System Interface Specification document to know how to set this parameter.

5.1.7 > Anti-tamper / anti-pulling switches

Please refer also to "Tamper Switch" section.

These switches are activated as soon as there is enough pressure applied on the terminal against the wall. They are deactivated as soon as this pressure is not big enough, e.g. when the terminal is pulled out of the wall.

When the switches are deactivated, the Morpho*Wave* XP2 terminal acts as required by the related configuration key (see Morpho*Wave* XP2 Administrator / User Guide for key configuration description):

- Ignore the event (default): useful during normal maintenance operations.

- Send an alarm message to the Central Access Controller, through the usual channel of the access control result messages (Wiegand, DataClock, RS485 or Ethernet). An alarm switch (relay contact) is directly available on block terminal «tamper switch pins». Please refer to "Wiring overview" and to "Tamper Switch" sections.

- Generate an audible alarm signal with the speaker and an alert message on the screen.

6 / Accessories, Software Licenses and PC Applications

6.1 > Compatible Accessories, Licenses and Software

The following items can be ordered directly to IDEMIA or to an official distributor, so as to enjoy all the features of your Morpho*Wave* XP₂ terminal:

Power supply units,

Contactless smartcards: MIFARE® 1k, 4k; DESFire® 2k, 4k, 8k,

HID® credentials support licenses:

BT_SMARTCARD_HID: enabling support of HID® iClass® and Seos™ cards

BT_BLE_HID: enabling support of HID® Mobile Access over BLE

User database size license:

MA_100K_USERS: enabling database size upgrade from 40,000 to 100,000 users capacity at creation of the database.

6.2 > Compatible PC applications

Morpho*Wave* XP₂ terminals are fully compatible with:

MorphoManager (version 13 or higher)

Morpho Integrator's Kit (MIK) software development kit (version 6 or higher).

MorphoBioToolBox (version 4 or higher)

7 / Recommendations

Global warning

The manufacturer cannot be held responsible in case of non-compliance with the following recommendations or incorrect use of the terminal.

General precautions

Do not attempt to repair your terminal yourself. The manufacturer cannot be held responsible for any damage/accident that may result from attempts to repair components. Any work carried out by non-authorized personnel will invalidate your warranty.

Do not expose your terminal to extreme temperatures.

Use your terminal with original accessories. Attempts to integrate unapproved accessories to the terminal will void your warranty.

To ensure the proper operation of the product and prevent image retention on LCD screen, it is highly recommended not to display a static image on the screen for extended periods of time and to configure the device to repeatedly refresh the image displayed on the screen. Please note that image retention on LCD screen is considered improper use of the product and is not covered by the product warranty.

Due to electrostatic discharge, and depending on the environment, synthetic carpet should be avoided in areas where the terminal has been installed.

Do not tilt the product.

Do not use blunt force on the product.

Do not attach anything to the product.

Do not place anything on the product.

Switch off the device before unplugging it.

To ensure the proper operation of the product and prevent degradation due to overvoltage, it is highly recommended to protect the devices with external accessory. Typically, risks of overvoltage have been identified on external power management wire, POE connector and Wiegand input wire.

Biometric performance

Do not scratch the product, particularly on the glass, because the performance of the product depends on the state of the glass surface and its anti-reflective face.

Clean the glass every day to optimize performance of the product.

Avoid direct sun light on the product.

Areas containing combustibles

It is strongly recommended not to install your terminal in the vicinity of gas stations, petroleum processing facilities or any other facility containing flammable or combustible gasses or materials.

Specific precautions for terminals equipped with a contactless smartcard reader

It is recommended to install terminals equipped with a contactless smartcard reader at a certain distance (> 30cm) from metallic elements such as iron fixations or lift gates or radio product (such as contactless smartcard reader). Performances in terms of contactless badge reading distance will decrease when metallic elements are closer.

Ethernet connection

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

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

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

Using PoE+

The Morpho*Wave* XP2 can consume more power than the 13 Watt allowed by the PoE standard and must be connected to a network switch supporting PoE+.

The Morpho*Wave* XP2 will need the maximum power when a user swipes his/her hand through the reader and when reading a contactless card.

The PoE+ standard can support devices consuming up to 25.5W of power. The network switch will detect automatically that the device is a PoE+ device (802.3at compliant) at power up and provide the required power so the device can start.

However, the standard also specifies a LLDP protocol that is used after the device is started. The LLDP protocol is bidirectional and is carried over Ethernet frames. It allows the network switch and the device to negotiate the amount of power needed by the terminal and the amount of power that the switch is allocating for the device.

It is important to configure the switch to allocate the proper amount of power for the Morpho*Wave* XP2 so it can work properly.

A typical sign of misconfiguration is that, when a user swipes his/her hand through the reader, the terminal will reboot because the switch will refuse to provide the required amount of power.

The Morpho*Wave* XP2 will send a LLDP request for 25.5W and a "Critical" level. The switch shall be configured to allow the terminal to consume up to 25.5W of power.

Managed vs non-managed PoE+ switches

Managed switches will tend to control the power distribution in a very precise way and need to be properly configured but will not overcommit their power supply.

Unmanaged PoE+ switches may be more tolerant about the power distribution and may only limit the total power distributed. In this case, it is important to evaluate the peak power supply necessary for all the connected terminals and insure that it does not exceed the power supply of the switch.

Example of PoE+ Switch configuration: HP ARUBA switches 2530-24-PoE+

For the ARUBA switches, two options are possible for the configuration setting:

- Fixed : Allocate 30W for each PoE+ port

    This option will limit the number of Morpho*Wave* XP2 terminals connected to the switch because it will refuse to overcommit its power supply.

    The commands to set this configuration are:

    > (config)# interface X poe-allocate-by value
    > (config)# interface X poe-value 30

    Where X is the port number.

- Usage: Allocate the power dynamically to the device as required

    This second option will be more flexible because the devices are unlikely to be consuming the maximum amount of power at the same time.

    The commands to set this configuration are:

    > (config)# interface X poe-allocate-by usage
    > (config)# interface X poe-lldp-detect enabled

Where X is the port number.

Date / Time synchronization

The terminal's clock may have a time deviation of few seconds depending on the temperature.

If the terminal is used in an application requiring high time precision, we recommend synchronizing regularly your terminal time with an external clock (using NTP). Every 24 hours is usually enough for most applications.

Please note that the date/time of the terminal is protected from power failure during at least 72 hours. If the duration of the power failure or power down is longer, the date/time of the terminal will be lost.

Cleaning precautions

The use of a dry cloth is recommended to clean the terminal, especially the front face. It is recommended to clean the product daily to ensure the best performance level over its lifetime.

Disinfection and sanitization recommendations

1- Moisten a non-abrasive wipe (such as Economizer® Wipers or 3M Scotch-Brite® High Performance Cloth) with the following disinfectants:

- Windex® Multi-Surface Disinfectant or another similar product containing L-Lactic acid.

- Hydrogen peroxide (< 3%)

2- Wipe the device's surface and leave the surface wet with disinfectant for at least 5 minutes

Important notice:

The following practices permanently damage and/or negatively impact the performances of the device:

- Do not use bleach or disinfectants containing aggressive substances such as chlorine, soda, alcohol, quaternary ammonium etc.

- Do not spray directly on the biometric sensor or the casing of the terminal

- Do not use abrasive cloths or wipes (e.g., paper towels)

8 / Annex 1: finger placement recommendations

8.1 > Main principles

Morpho*Wave* XP2 is a biometric acquisition terminal which captures fingerprints by the applicant waving their hand through the active volume. The product can track and capture simultaneously up to 4 fingerprints at a maximum speed of 0.5m/s.

To acquire fingerprints, the applicant waves his/her hand between the product glass and protective cap as shown in the Figure below.

Figure 35: Typical wave hand

Note: The recommended hand wave direction is from right to left, even though the sensor will accept both directions.

Hand wave from the left

Hand wave from the right

Figure 36: Possible wave hand

8.2 > Capture recommendations

8.2.1 > Proper Use

Below are several illustrations and guidelines on how to best use your new Morpho*Wave* XP₂ device.

Insert your hand flat, palm down, from the front of the scanner
Slightly spread apart your fingers

Place your hand between the cover and the optical sensor
Slide your hand from right to left or left to right

Figure 37: Capture recommendations – Proper Use

8.2.2 > Improper Use

The following illustrations show what NOT to do when using Finger on the Fly.

Do not cross your fingers

Do not place your hand with fingers spread wide

Do not place your fingers tightly together

Do not place 2 hands inside

Do not touch the cover

Do not place your hand on the optical sensor

Do not place your hand on the edge of the optical sensor

Do not tilt your hand (left to right or fingertip to palm)

Do not insert your hand fingers first from either the left or right side of the scanner

Figure 38: Capture recommendations – Improper Use

9 / Annex 2: Bibliography

9.1 > How to get the latest versions of documents

For the latest firmware, software, document releases, and news, please check our website:

https://biometricdevices.idemia.com

To get your login and password please contact your sales representative.

9.2 > Documents about the Morpho*Wave* XP2 terminal

Documents about installing the terminal

Quick Installation Guide,

This document describes the main steps for wall mounting.

Installation Guide,

This document describes terminal physical mounting procedure, electrical interfaces and connection procedures. This document is in English.

Documents about administrating / using the terminal

Quick User Guide,

This document gives a quick overview of the product and the basics of configuration and use. This document is in English.

Administration Guide,

This document describes the different functions available on the terminal and procedures for configuring the terminal. This document is in English.

Parameters Guide,

This document contains the full description of all the terminal configuration parameters. This document is in English.

Documents for the developer

Host System and Remote Message Interfaces,

This document describes the commands supported by the terminal and the format of messages sent by the terminal to a distant system. This document is in English.

Release note

For each firmware version, a release note is published describing the new features, the supported products, the potential known issues, the upgrade / downgrade limitations, the recommendations, the potential restrictions…

10 / Annex 3: Support

10.1 > Troubleshooting

The terminal IP address is unknown or it is not possible to connect to the terminal

Use terminal interface to configure a valid set of network parameters in your terminal.

The sensor is switched off

Check that the database contains at least one record.

Check that the identification mode is enabled.

The terminal returns erratic responses to Ping commands

Check the subnet mask.

Ask the network administrator for the correct value.

Check that each device connected to the network has a different IP address.

10.2 > Technical Support and Hotline

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