

MORPHO



# The Ultimate Set of Keys



# The Ultimate Fingerprint Readers



# Cost-effective Protection Throughout Your Organization

## How to protect your bottom line

### Cutting cost, minimizing risk

#### Accuracy

- Eliminates the cost and administration associated with backup or bypass systems (PINs, cards, passwords etc).
- World-leading algorithms designed to manage even the most damaged fingerprints accurately and consistently in the harshest environments.

#### Capacity

- Investment is protected as the solution is able to grow and adapt to an organization's changing needs.
- Fully scalable solutions to address a variety of applications in organizations of any size.

#### Security

- Eradicates the threats and expense of security breaches such as: buddy punching, key, card, PIN, and password theft.
- Ultra-secure matching thresholds ensure stringent enforcement of security policies.

#### Integration

- Does away with the cost and effort involved in running multiple systems, interfaces and databases.
- A single solution for integration into a diverse range of business processes dependent on identification of individuals e.g. payroll, time and attendance, health and safety, IT, security and HR applications.

#### Speed

- Reduces the number of required readers and eliminates delays and lost productivity resulting from queue times.
- Industry-leading matching speeds ensure maximum throughput and convenience.

**Morpho = Bottom Line Protection**

# 3 Billion Fingerprints in Over 100 Countries

Successfully supporting U.S. Government FIPS 201 Standards: TWIC, PIV, and CAC Endpoint Cards

Accurate identification and authentication in:

## Vertical Markets

- Manufacturing • Warehouses • Offices • Mines
- Stadia • Shopping Centers • Residential Properties
- Businesses • Retailers • Health Clubs
- Country Clubs • Schools • Universities • Colleges
- Construction • Banking • Government
- Ports • Airports • Logistics

## Horizontal Markets

- Enterprise Solutions • Physical Access • Logical Access
- Time & Attendance • Payroll • Building Management
- Visitor management • Health & Safety • Workforce Access
- Activity Management • Home & Office Automation
- Industrial Automation • Transaction Authorization
- Higher Security • Account Management • Loyalty & Membership



everyone ✓ everytime ✓ everywhere ✓

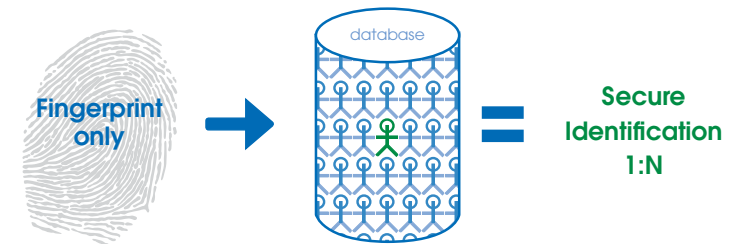
# Morpho = Genuine Identification, Genuine Authentication

## Absolute certainty of people's identities

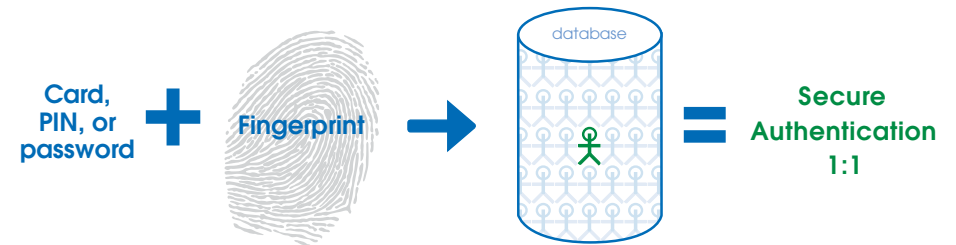
### Identification and authentication by Morpho technology, compared to cards, PINs and passwords

A Morpho-based solution can work in identification mode, authentication mode, or a combination of both.

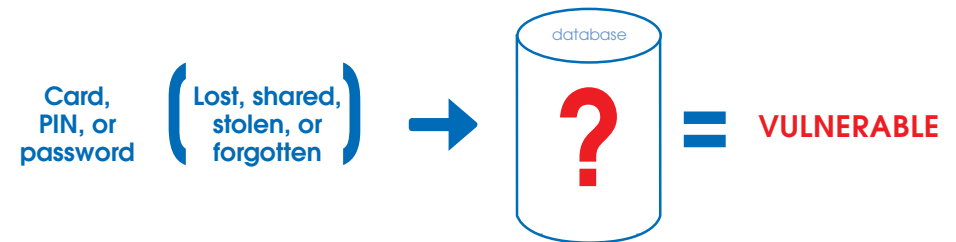
Identification compares a user's fingerprint to all records in the database, returning an exact match and positively identifying them. This process is called one-to-many or 1:N.



Authentication matches a user's fingerprint data with additional information in their possession – for example a password, PIN, or card. This process is called one-to-one or 1:1.



Cards only control the access of authorized pieces of plastic, but not who is in possession of the card, which can be shared, or stolen. Similarly, the use of PINs and passwords requires an individual to punch in a specific code to gain entry, but who actually entered the code cannot be determined as PINs and passwords can also be shared, stolen, or forgotten.

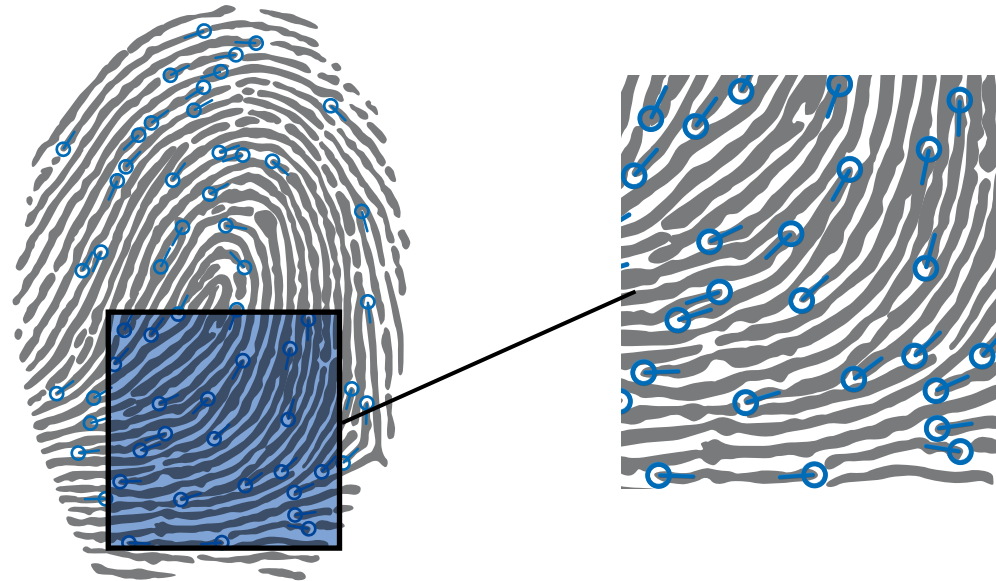


**Morpho = Access Controlled**

## Morpho Algorithms = More True Minutia Points

Minimal rates of false acceptances and rejections routinely caused by lesser biometrics

Graphic of true minutia points showing where fingerprint ridges split or end



Referred to as a template, the unique pattern formed by true minutia points distinguishes one fingerprint from all others.

Morpho fingerprint scanners are approximately 50% larger than most competing scanners and thus capture more true minutia points, creating highly accurate templates.

Other technologies also register false minutia points caused by injury or dirt. This reduces template accuracy even further, causing dangerously high levels of false acceptances and false rejections.

In contrast, Morpho's advanced algorithms detect and exclude these false minutiae, resulting in more accurate templates.

Morpho's superior scanners and algorithms deliver faster and more accurate identification than any other fingerprint technology.

The company's world leadership in biometrics is based on experience dating back to 1974, including partnerships with international law enforcement and government agencies.

## Unrivaled Accuracy



**Morpho =**  
Unrivaled Accuracy  
from True Minutia Points

# Biometrics Explained

## Ergonomic Design

The design of Morpho fingerprint readers results from extensive experience in biometrics dating back to 1974. The size of the scanner, and the angle of its position, ensures optimum fingerprint-capture and ease of use.

## Analytical Algorithms

Testing and benchmarking surveys by the US National Institute of Standards & Technology (NIST) and NIST Minutia Interoperability Exchange (MINEX) consistently rank Morpho algorithms among the world's top performers.

Morpho algorithms are entrusted to manage more than 3 billion fingerprints worldwide.





Fast, accurate and reliable fingerprint matching is imperative for Morpho clients, particularly those such as government agencies.

## Matching Speed

Morpho technology is renowned as the world's fastest and most accurate, for example:

Fingerprint matching speeds in Morpho logical access systems (MorphoSmart) against a database of 10 000 users:

- Identification: less than 1 second
- Authentication: less than 0.8 seconds

Morpho Biometric Terminal Options Matrix																
	MorphoAccess Range	Weather Resistance	Internal Relay	User Capacity	WiFi Option	Matching Mode	Internal Card Reader	Matching Options								
								FP* Only	PIN Only	PIN + FP	Card Only	Card + PIN	Card+ FP	Card + BioPIN	Card + PIN + FP	Card + PIN + BioPIN
 <b>FINGERPRINT FINGER VEIN</b>	VP-Bio	IP65	Yes	5000	Yes	Multi-Biometric	No	Yes +FV	No	No	No	No	No	No	No	No
	VP-Bio Extended	IP65	Yes	10,000	Yes	Multi-Biometric	No	Yes +FV	No	No	No	No	No	No	No	No
	VP-Dual	IP65	Yes	5000	Yes	Multi Factor & Multi Bio	Yes (MiFare/DESfire)	Yes +FV	No	No	Yes	No	Yes	No	No	No
	VP Dual Extended	IP65	Yes	10,000	Yes	Multi Factor & Multi Bio	Yes (MiFare/DESfire)	Yes +FV	No	No	Yes	No	Yes	No	No	No
*MA VP also includes Finger Vein Biometrics in addition to Fingerprint																
	J-Series Bio	IP65	Yes	500	Yes	Identification only	No	Yes	No	No	No	No	No	No	No	No
	J-Series Bio Extended	IP65	Yes	3 000	Yes	Identification only	No	Yes	No	No	No	No	No	No	No	No
	J-Series Dual	IP65	Yes	500	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	No	No	Yes	No	Yes	No	No	No
	J-Series Dual Extended	IP65	Yes	3 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	No	No	Yes	No	Yes	No	No	No
	MA 500+	IP30	Yes	3 000	Yes	Identification only	No	Yes	Yes	Yes	No	No	No	No	No	No
	MA 500+ Extended	IP30	Yes	50 000	Yes	Identification only	No	Yes	Yes	Yes	No	No	No	No	No	No
	MA 520+ D	IP30	Yes	3 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	MA 521+ D	IP30	Yes	3 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	MA 520 D Extended	IP30	Yes	50 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	MA 521 D Extended	IP30	Yes	50 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	OMA 520 D	IP65	Yes	3 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	OMA 521 D	IP65	Yes	3 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	OMA 520 D Extended	IP65	Yes	50 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	OMA 521 D Extended	IP65	Yes	50 000	Yes	Multi-Factor	Yes (MiFare/DESfire)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multifactor (Merged) mode = Reader is able to dynamically switch between Identification and various Authentication Modes. During enrollment each user can be assigned any one of these modes																
In this mode the users PIN number is the same as the system identifier number																

Fingerprint identification-matching speeds in Morpho physical access systems (MorphoAccess 500 series) against a database of:

- 1 000 users < 0.9 seconds
- 3 000 users < 1.1 seconds
- 10 000 users < 1.8 seconds

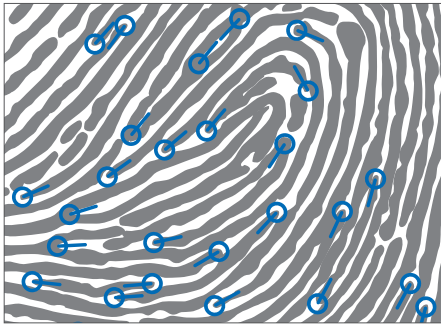
Fingerprint authentication-matching speeds in Morpho physical access systems (MorphoAccess 500 series) is 0.7 seconds.

## Capacity

The MorphoAccess range of readers caters for implementations of varying sizes. The database capacity of MorphoAccess readers facilitates the management of:

- 500 users (1 000 fingerprint capacity)
- 3 000 users (6 000 fingerprint capacity)
- 50 000 users (100 000 fingerprint capacity)

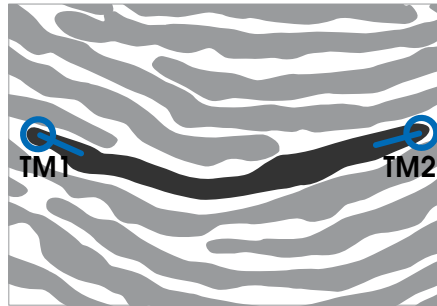
The readers also offer multifactor authentication with MiFare and DesFire contactless cards, fingerprints, and PINs, as per the matrix opposite.



Networking capabilities enable the readers to address all security applications – from one-door control to the protection of buildings and vast infrastructures.

## True minutia points

Typically, a rolled fingerprint has around 80 minutia points. These are the positions on a fingerprint where ridges split or end – as shown below.



A damaged fingerprint could have >150 minutia points, of which some 50% may be false. If these false points are misinterpreted as true minutiae, matching accuracy is severely compromised.

## Accuracy

Consistently accurate fingerprint matching relies on algorithms that:

1. Detect and identify the positions of true minutia points
2. Predict the positions of obscured, distorted, or erased true minutia points
3. Recognize and exclude false minutia points created by injury, dirt, or liquid.

The graphic illustrates a single ridge on a fingerprint. At each end of the ridge there is a termination marked by true minutia points: TM1 and TM2.

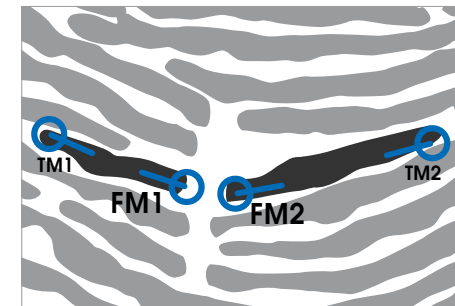
## False minutia points

Morpho's ability to correctly detect false minutiae and predict missing minutiae has been consistently proven around the world in government systems comprising many millions of fingerprint records.

These abilities are also clearly proven in environments that typically exhibit the worst quality fingerprints: mining, construction, agriculture, manufacturing, and pension payments.

Morpho's analytical algorithms have been developed to recognize and reject data produced by distortion, injury, dirt or liquid and accurately predict missing fingerprint information.

If the continuity of a fingerprint ridge is interrupted by an injury, two additional terminations are created on this ridge, these are false minutiae. In reality, injuries commonly intersect multiple ridges, resulting in dozens of false minutia points, as marked FM1 and FM2 in the graphic below.



It is this type of false data that continuously causes lesser biometric systems to produce false acceptances and false rejections when dealing with damaged or dirty fingerprints or scanners.

## Integration

To maintain its world-leading rankings, Morpho continuously refines its fingerprint technology to allow optimum integration into related software and technologies, such as payroll, time and attendance, health and safety, IT, security, and HR applications.

## Scanners

Morpho scanners conform to biometric industry benchmarks defined by NIST, MINEX, and NIST PIV (Personal Identity Verification).

These standards ensure that Morpho scanners are the ideal choice for professional fingerprint identification solutions.



*These four images illustrate fingerprint readers with a scanning surface smaller than that used by Morpho. A smaller scanner surface captures a much smaller set of minutia data during enrollment. These enrollments are likely to result in higher false rejection rates unless exactly the same surface area is subsequently scanned.*

The size of a scanner's surface area determines the amount of fingerprint and minutia data that can be captured: the larger the surface area, the larger the amount of data.

The images on the right are of a fingerprint captured on a Morpho MSO scanner.

The coloured shapes superimposed on the Morpho print show the surface area captured by four other scanners.

As demonstrated here, not one of the four smaller scanners captures nearly as much of the data acquired by the Morpho scanner. Smaller scanners neglect valuable minutia points on the periphery of the fingerprint, thus requiring users to place their finger in exactly the same position each time they use the reader.

Morpho scanners capture much more data, so a user can place their finger differently every time they scan and a positive match will be made.

### Optical vs capacitive and thermal

Morpho scanners use high-end optical sensors. An advantage of optical scanners is that they can be produced with a much larger surface than capacitive and thermal sensors.

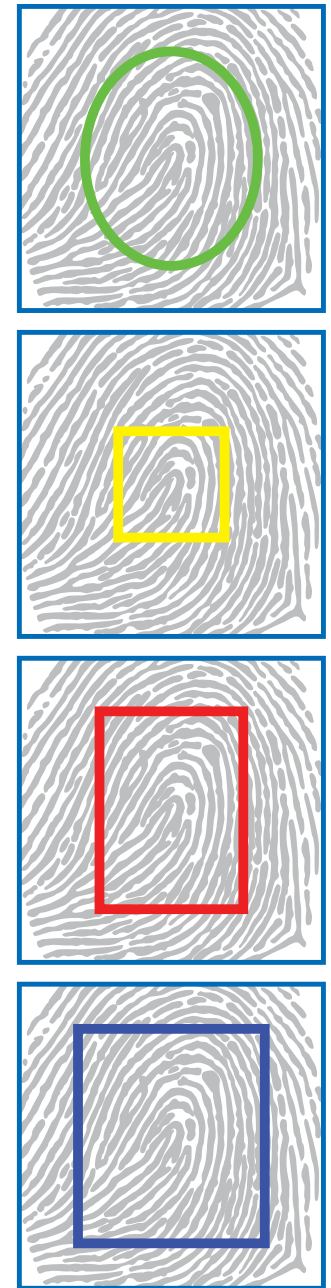
The Morpho reflecting prism is situated within the scanner and can withstand the effects of Electro-Static Discharge (ESD) that commonly disable capacitive scanners.

Thermal scanners also suffer abrasive damage during use and are therefore much less durable than optical scanners.

### The key to a perfect match

A highly competent fingerprint scanner must operate in conjunction with algorithms that accurately analyze and encode scanned images.

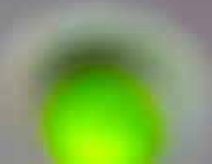
Morpho's superior scanners and algorithms deliver faster and more accurate identification than any other fingerprint technology based on the scanners' ability to capture accurate data as well as the algorithms' analytical and predictive capabilities.



# MorphoAccess

Please place  
your finger

02:01 MAR 27



# Morpho = Unmatched Experience, Unmatched Performance

Morpho Biometric technology manages more than 3 billion fingerprints worldwide. With unrivalled performance in more industries and tougher environments than any other reader, Morpho is the most trusted provider of biometrics for access control and time and attendance. Morpho supports FIPS 201 Standards: TWIC, PIV, and CAC Endpoint Cards.

Morpho ranked #1 for its biometric matching technology in 2011 NIST benchmark tests for both proprietary and interoperable template formats. In the MINEX interoperability evaluation, Morpho's algorithms were #1 performer in both accuracy and interoperability under all conditions, clearly establishing Morpho as the fingerprint biometric vendor of choice. Reference: [www.NIST.GOV](http://www.NIST.GOV)

MorphoTrak Inc., a subsidiary of Morpho, provides biometric and identity management solutions to a broad array of markets in the U.S. including law enforcement, border control, civil identification, and facility/IT security. L-1 Identity Solutions has been acquired by Morpho, and is now part of Morpho, Safran group's security division. Reporting to Morpho, MorphoTrak is part of the world's largest biometric company. Morpho is a leading innovator in large fingerprint identification systems, facial and iris recognition, as well as secure credentials. With over 35 years' experience, Morpho products are used by more than 450 government agencies in over 100 countries.

## MorphoTrak Certified Partner Channel

MorphoTrak offers a comprehensive range of biometric hardware, software and development tools enabling Certified Partners to fully integrate our biometric technology into world leading solutions for:

- Physical Access Control
- Logical Access Control
- Time & Attendance
- Automation (home, office and industry)
- Resource management and productivity solutions

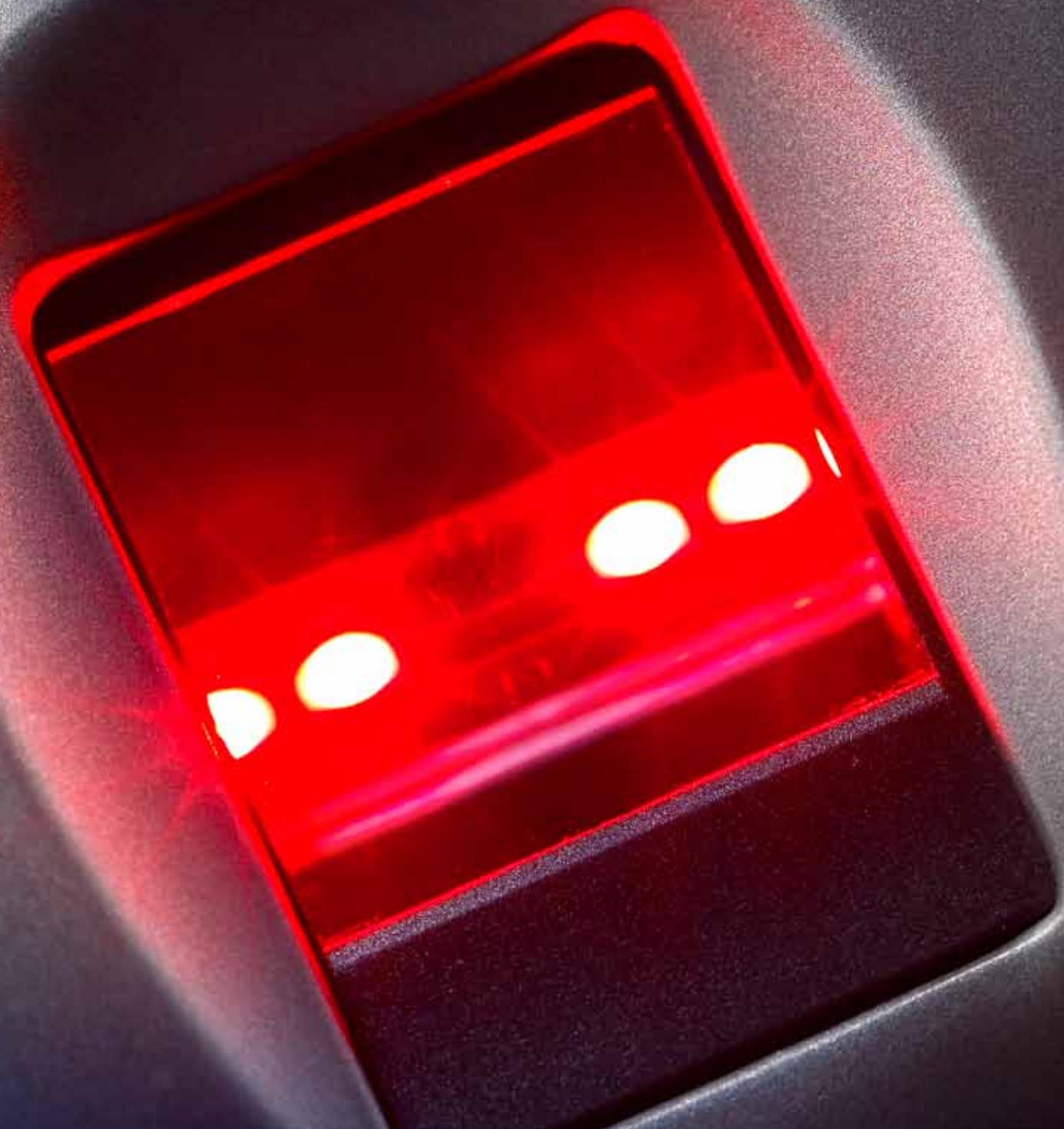
While many biometric systems appear to work fairly well in limited and controlled applications, in real-world deployments biometric data and/or the capture devices are constantly subjected to dirt, damage, and changes in environmental and physiological conditions.

With over three decades of industry-leading expertise and field proven technology, Morpho products are specifically designed to operate in, and manage fingerprint quality typical of the toughest industries and environments. The world's leading manufacturers of security and time products rely on Morpho biometrics at the core of their solutions.



**Morpho: Biometric Security, Productivity & Convenience Solutions (BSPC)**

MORPHO



# Morpho = Fingerprint Readers for Every Application



**MA J-Series**

IP65 access control for indoor & outdoor sheltered use  
PoE and optional WiFi  
Available MiFare and DESfire options - J Dual  
500 to 3000 users



**MA 500+**

For access and time & attendance  
Up to 50 000 users  
PoE and optional WiFi  
Available MiFare/DESfire options - MA 520+ D



**OMA 520 D**

IP65 for access and time & attendance  
Up to 50 000 users  
PoE and optional WiFi  
MiFare and DESfire contactless smart card reader



**MA VP**

Dual Fingerprint/Finger Vein Recognition  
Multiple Interfaces: POE on RJ45 & WiFi  
Ultimate balance of security & ease of use



**MARC**

Robust and portable  
For access control, time & attendance  
Compatible with MA 500 and MA 500+ series



**MSO 300**

High-volume enrollment  
PC login applications  
Harsh environments  
Certified FBI PIV IQS, FIPS201, MINEX



**MSO 1300**

For logical access  
ID management  
PIV-compliant  
Enhanced security features



**MSO VP**

Standalone desktop unit  
Dual Fingerprint/Finger Vein Recognition  
Innovative and universal biometric technology  
Enhanced anti-spoofing capabilities

## FIPS 201 Approved Product Range



### OMA 521 D

IP65 rated, -40° F option  
 Contactless PIV compliant card reader for 3-factor authentication  
 TSA TWIC ICE Approved  
 Easy interface with new or legacy access systems



### MA J-Series TWIC

Supports PIV, TWIC, CAC with contact & contactless card reader  
 Ingress Protection IP65



### MorphoCheck

Read PIV, CAC, TWIC, FRAC, DESFire  
 Real-Time Ident & Verif  
 FBI PIV-IQS, FIPS201 certified optical sensor  
 Unrivaled Accuracy of Morpho algorithms



### MA 520 Dual

Supports PIV, TWIC, CAC with contact & contactless card reader  
 GSA certified CHUID reader for entire FASC-N  
 Most accurate & interoperable readers on GSA APL



### MA 520+ D

GSA APL certified CHUID reader  
 Power-over-Ethernet and optional ISO 14443-A&B contactless PIV-compliant reader with biometric sensor  
 TSA TWIC ICE approved



### MSO 350e/1350e

Smartcard reader & biometric sensor for 2-factor authentication  
 Supports FIPS201 compliant credentials  
 FIPS201 approved template generator & matcher  
 GSA APL listed



### MC75 Optical

Handheld Ident & Verif  
 Read PIV, CAC, TWIC, FRAC, DESFire  
 500 dpi optical fingerprint sensor  
 Most accurate, interoperable fingerprint technology on GSA FIPS201 APL



### OMA 520 Dual

Supports PIV, TWIC, CAC with contact & contactless card reader  
 Ingress protection IP65  
 Operational to down -40° F



# Cutting cost, minimizing risk

## Accuracy

Improve rules and records

## Capacity

Complete identity management

## Security

Minimize risk and liability

## Integration

Integrated work force management

## Speed

Improved productivity and efficiency

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