



Biode

**FINGERPRINT
IDENTIFICATION
SOLUTIONS**

**Morpho
Smart Optical**

The portable fingerprint reader series.



MSO 300 Series

Multi-application optical fingerprint sensor



Excellent fingerprint image quality: large capture surface, FBI PIV IQS certification

Enrollment, 1:1 verification and 1:N identification capabilities

High accuracy: embedded FIPS 201 and MINEX compliant algorithms

Large internal database capacity: up to 5000 users (2 templates each)

Options: fake finger detection, smartcard reader, security features

The MSO 300 Series

is a family of high-end optical sensors, based on IDEMIA's unrivalled experience in the fields of electro-optics and forensic quality fingerprint processing algorithms.

The devices cover a wide range of applications: enrollment, authentication and identification in industrial/commercial and governmental environments.



- A versatile device that carries out **both enrollment and comparison** (1:1 authentication and 1:N identification)
- **Excellent fingerprint capture and processing performance** with the largest single fingerprint optical sensor on the market (23x23mm, 500 dpi, 256 grey levels)
 - Authentication < 0.7 sec⁽¹⁾
 - Identification < 0.9 sec in 1:1000 mode⁽¹⁾
 - Top grade solution to register young or elderly people, manual laborers (mining, textile, etc.)
- **Overall performance certified at the highest levels:**
 - FBI PIV IQS (image quality)
 - MINEX compliant algorithms
 - FIPS 201
 - STQC
 - Common Criteria for fingerprint spoof detection (certified by BSI⁽²⁾)
- **Accurate:** the false acceptance rate (FAR) is configurable down to 10⁻⁸ - depending on the security requirements - and maintained regardless of number of users in database
- **Guides the user and automatically controls the image quality** during fingerprint capture
- **Large internal database:** standard capacity of 500 users (2 fingerprints each), extendable to 3000 (with MSO IDENTLITE license) or 5000 (with MSO IDENTPLUS license)
- **Multiple template & image formats:**
 - ISO 19794-2, ANSI/INCITS 378, Proprietary
 - ISO 19794-4, WSQ compressed image
- **Options:**
 - Smartcard reader
 - Fake finger detection (Common Criteria certified)
 - Security features to protect the communication channel between host and device (integrity check, data encryption)

SOFTWARE PACKAGES

- The **MSO SDK** is available to integrate easily the MSO 300 sensors into various applications and use their embedded capabilities:
 - Available for Windows, Linux and Android platforms
 - Includes a BioAPI interface

NB: Low level protocol (ILV) is also available

- The MSO 300 Series can also be used with **MorphoKit™** by IDEMIA, advanced SDK for the capture and processing of fingerprint images, authentication and identification

		MSO 300	MSO 301	MSO 350	MSO 351
Interface		USB			
Internal database		From 500 to 5000 users (with licenses)			
Fake finger detection		—	Yes	—	Yes
Smartcard reader		—	—	Yes	Yes
Security Layer		Optional			
Certifications	FBI PIV IQS	Yes			
	MINEX compliant algorithms	Yes			
	FIPS 201	—	—	Yes	—
	Common Criteria by BSI ⁽²⁾	—	Yes	—	—
	STQC	Yes			

⁽¹⁾ Includes detection, encoding and matching

⁽²⁾ BSI = Bundesamt für Sicherheit in der Informationstechnik (German Federal Agency for the Security of Information Technologies)

MSO 1300 Series

USB fingerprint devices
for highly secure desktop applications



All-in-one solution: superior performance Enrollment, Verification and Identification

FIPS 201 and MINEX compliant Feature Extractor & Matcher onboard

FBI PIV IQS certification and fake finger detection available

Extensive security features, including encryption and digital signature

Smartcard reader variant for Match-on-Card applications



The MSO 1300 Series is a range of compact biometric USB devices. They use IDEMIA's patented optical technology and fingerprint algorithms, both acknowledged worldwide for their high levels of performance and their exceptional robustness. IDEMIA fingerprint technology is ranked #1 by NIST for accuracy.

The MSO 1300 Series offers a reliable, ergonomic and cost-effective solution for enrollment, identity verification and user identification. Their match-on-device or match-on-card functions guarantee the faultless protection of information and the security of desktop applications.



Why optical technology?

We selected optical technology for our sensors as it has significantly more operational and accuracy advantages compared with other technologies.

	OPTICAL	CAPACITIVE	SWIPE
Acquisition surface/resolution	●●●●	●●○○ Limited due to silicon chip cost	●○○○
Ergonomics	●●●● Visual indicator (LED light)	●●○○	●○○○ Usually requires several trials
Robustness	●●●●	●○○○ Sensitive to scratches, ESD damages, corrosion	●○○○
Fast processing time	●●●●	●●●●	●○○○ Requires image reconstruction
Performance/accuracy	●●●●	●●○○	●○○○

High quality fingerprint acquisition

Optical technology offers superior image quality

- High performance sensor: 500 dpi, 256 grey levels
- Available output formats include RAW, ISO 19794-4 or WSQ-compressed (under license) images

Lessons learnt from real world deployments put into practice

- Mechanical/visual guides ensure intuitive finger placement
- Interfaces display key information to help users: live image, messages (position, pressure etc.) and fingerprint quality score

Large acquisition surface for optimized capture and repeatable placement

MSO 1300 Series capture surface (14x22mm) ensures that the richest area on fingerprints is systematically captured time after time. Acquisition surface contributes significantly to the overall biometric performance:

- It determines the amount of minutiae data that can be captured
- Other, smaller sensors, allow different areas of the same finger to be presented with each placement, leading to poor data acquisition, narrow areas of overlap and matching errors



Richest area



MSO 1300 Series capture



Placement variations on smaller sensors

More than sensors, intelligent devices

While most sensors on the market are only capable of producing fingerprint images, the MSO 1300 Series devices are also capable of processing them internally, running powerful algorithms directly on their embedded processor.

- 1 Image Compression** using WSQ algorithm from FBI/NIST
- 2 Biometric Feature Extraction** to generate templates
 - Feature Extractor is MINEX/FIPS 201 compliant
 - Proprietary, ISO 19794-2 or ANSI 378 template formats available
 - Templates can be stored in the internal database
- 3 Biometric Matching**
 - Matcher is MINEX/FIPS 201 compliant
 - 1:1 authentication or 1:N identification
 - High accuracy: the False Acceptance Rate (FAR) is configurable down to 10^{-8} (depending on the security requirements) and **maintained regardless of number of users in database**
 - Fast matching (refer to the table entitled "2 designs, 4 variants")
 - Match-on-Card is available on MSO 1350 V3 / MSO 1350 E3
- 4 Capability of addressing juvenile fingers**
- 5 An anti-latency feature** detects fingerprint traces reactivated under certain lighting conditions

Embedded security features

When sensitive data (image or template) needs to be shared with a Host System, the MSO 1300 Series devices are capable of securing them before dispatching.

- 1 Multiple security principles available:**
 - Symmetric and asymmetric keys,
 - Key derivation,
 - Hashing algorithm,
 - Random number generator,
 - etc.
- 2 Image and Template Encryption** for the sake of confidentiality
- 3 Template Signature (X9.84 standard)** to guarantee the origin and the integrity of the data sent to the Host System
- 4 The communication channel between device and Host/Distant System can be protected** using either Secure Tunneling or Offered Security mode

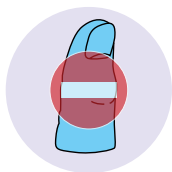
MSO 1300 E3 & MSO 1350 E3: best in series, best in class



Enhanced image quality

These precision designed, top of the range devices produce a fingerprint image that is certified PIV IQS by the FBI.

The reference standard in terms of single fingerprint image quality (equivalent to ISO 19794-4:2011 Annexure B) was defined to ensure in particular interoperability between multiple solutions.



Fake finger detection

MSO 1300 E3 and MSO 1350 E3 detect a large panel of counterfeit fingerprints, including but not limited to those made with latex, Plasticine, Kapton, transparent film, rubber, Play-Doh, graphite or paper.

Multiple applications

- Deployment of light and reliable solutions for **population registration** or **customer acquisition**
- **Logical access control**
 - Banking and finance: secure and swift access to core banking applications or trading stations in dealing rooms
 - Enterprise: biometric PC login and Single-Sign-On solutions (no more passwords)
 - Healthcare: access to medical records restricted to authorized staff
- **Easy and secure payment**
 - Fast, convenient, cashless payment at checkouts in stores, supermarkets or cafeterias
 - E-commerce secure payment
 - Check cashing services, pension/benefit payments after ID verification or identification

Software packages

- The **MSO SDK** enables a rapid integration and the use of device-embedded capabilities.
 - Available for Windows, Linux and Android platforms
 - Includes a BioAPI interface
- **Low level protocol** (ILV) is also available
- The MSO 1300 Series can be used with **MorphoKit™ by IDEMIA**, advanced SDK for the capture and processing of fingerprint images, authentication and identification



2 designs, 4 variants

		MSO 1300 V3	MSO 1300 E3	MSO 1350 V3	MSO 1350 E3
Dimensions (L x W x H)		68.7 x 39.7 x 15.3 mm (2.7 x 1.56 x 0.6 inches)		82 x 71 x 41 mm (3.23 x 2.8 x 1.61 inches)	
Weight		40g (1.41 oz)		140g (4.94 oz)	
Smartcard reader		—	—	Yes	Yes
Database capacity (users)		500, 3000 ⁽¹⁾ , 5000 ⁽²⁾ or 10 000 ⁽³⁾	500, 3000 ⁽¹⁾ or 5000 ⁽²⁾	500, 3000 ⁽¹⁾ , 5000 ⁽²⁾ or 10 000 ⁽³⁾	500, 3000 ⁽¹⁾ or 5000 ⁽²⁾
Database capacity (templates or fingers)		1000, 6000 ⁽¹⁾ , 10 000 ⁽²⁾ or 20 000 ⁽³⁾	1000, 6000 ⁽¹⁾ or 10 000 ⁽²⁾	1000, 6000 ⁽¹⁾ , 10 000 ⁽²⁾ or 20 000 ⁽³⁾	1000, 6000 ⁽¹⁾ or 10 000 ⁽²⁾
Match-on-Device capability (1:N)		1:500, 1:3000 ⁽¹⁾ , 1:5000 ⁽²⁾ or 1:10 000 ⁽³⁾	1:500, 1:3000 ⁽¹⁾ or 1:5000 ⁽²⁾	1:500, 1:3000 ⁽¹⁾ , 1:5000 ⁽²⁾ or 1:10 000 ⁽³⁾	1:500, 1:3000 ⁽¹⁾ or 1:5000 ⁽²⁾
Matching speed		0.6s in 1:1 mode / 0.7s in 1:500 mode			
Match-on-Card capability		—	—	Yes	Yes
Fake Finger Detection		—	Yes	—	Yes
Security Layer		Optional			
Certifications	FBI PIV IQS / ISO 19794-4: 2011 (Annex. B)	—	Yes	—	Yes
	MINEX & FIPS 201 compliant algorithms	Yes			
	STQC	—	Yes	—	Yes
	CE, CB, FCC, UL	Yes			
	RoHS, REACH, WEEE	Yes			
	WHQL drivers	Yes			

- ⁽¹⁾ With MSO IDENTLITE License loaded in the device
⁽²⁾ With MSO IDENTPLUS License loaded in the device
⁽³⁾ With MSO IDENT10K License loaded in the device

