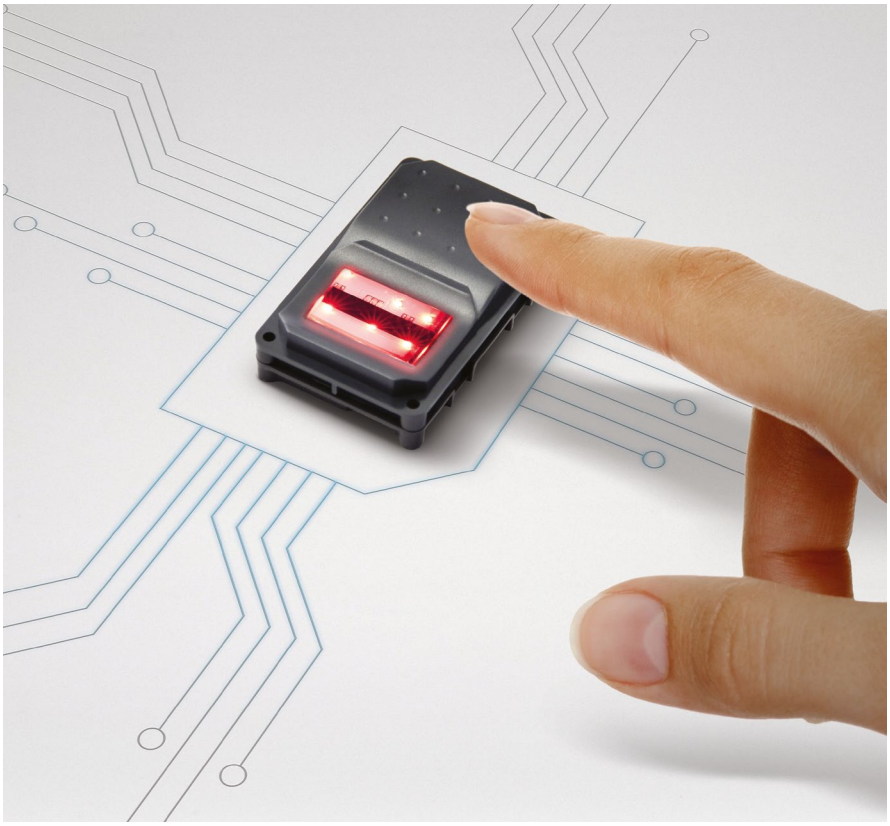
CBM-E4

Compact Biometric Module for OEM INTEGRATION



Why CBM-E4?

The CBM-E4 is IDEMIA Public Security's fourth-generation compact fingerprint module. It uses our IDEMIA's patented optical technology and biometric algorithms, both acknowledged worldwide for their high levels of accuracy and performance and their exceptional robustness. Whether used for off-the-shelf or custom-made applications, the CBM-E4 offers a flexible, cost-effective solution for the fast and secure processing of high-quality fingerprint images.

Key Benefits

Compact

The best, most compact optical module on the market

Embedded processing

Embedded processing capabilities: MINEX compliant Coder & Matcher inside

Easy integration

Easy integration of biometric functions into multiple applications

Secure

FBI PIV IQS certification and fake finger detection available

Extensive security features, including encryption and digital signature

High-quality

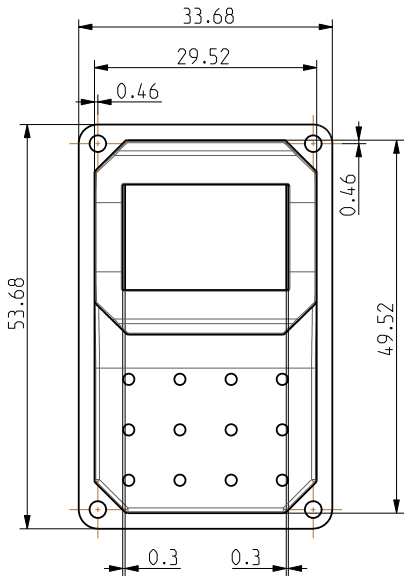
High-quality fingerprint acquisition

IDEMIA PUBLIC SECURITY

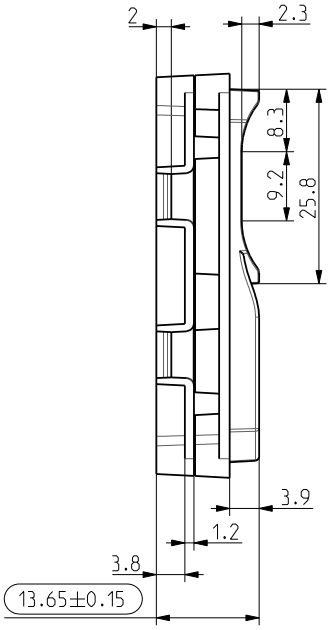
The most compact optical module on the market

Its original flat design (13.65mm height), small footprint (53.7x33.7mm) and very light weight (20g) make it the ideal component for integration into compact and mobile products.

Integrators can rapidly add the benefits of fingerprint recognition to their applications, without having specific knowledge of biometrics.



1:1 SCALE



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 damage, 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 gray levels
- Available output formats include RAW, ISO 19794-4, or WSQ-compressed (under license) images

Lessons learned 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

The CBM-E4's 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 | CBM capture | Placement variations on smaller sensors

More than a sensor: an intelligent module

While most sensors on the market are only capable of producing fingerprint images, the CBM-E4 module is also capable of processing them internally, running powerful algorithms directly on its 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 CBM-E4's internal database

3 **Biometric Matching**
- Matcher is MINEX/FIPS 201 compliant
- 1:1 authentication or 1:N identification
- High accuracy: The False Acceptance Rate is configurable down to 10^{-8} (depending on the security requirements) and maintained regardless of number of users in database
- Fast matching (this fourth generation integrates a faster processor)

4 **The CBM-E4 is capable of addressing juvenile fingers**

5 **The CBM implements an anti-latency feature** that detects fingerprint traces reactivated under certain lighting conditions

Embedded security features

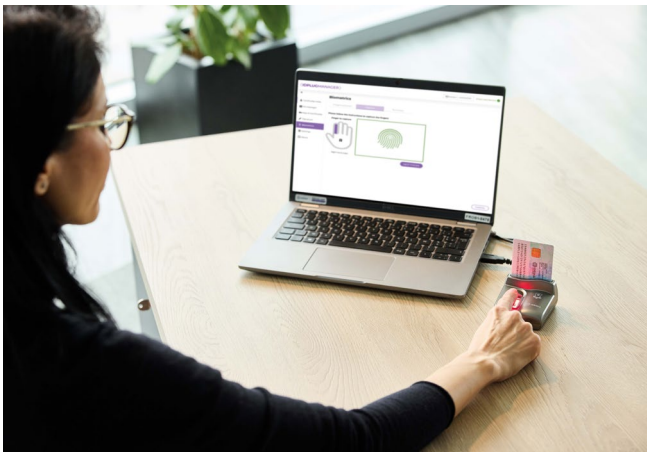
When sensitive data (image or template) needs to be shared with a Host System, the CBM-E4 module is capable of securing it before dispatching.

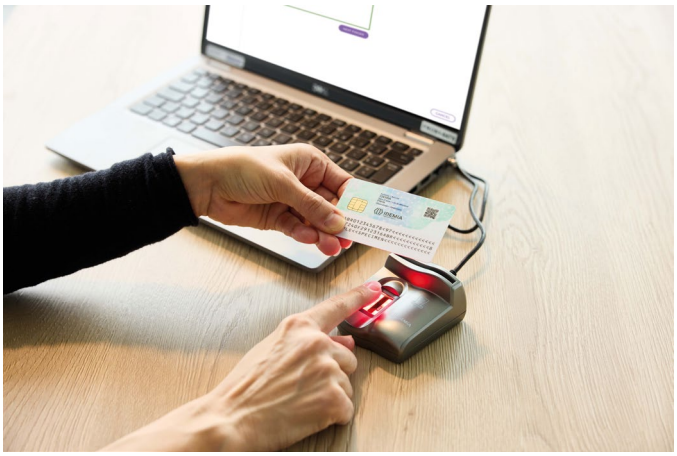
1 > IDEMIA Public Security's signed certificate is loaded on every device.

2 > Secure tunneling mode can be activated before or after deployment.

3 > Up-to-date algorithms are used to protect data, and commands are sent to the host (AES-256, SHA-256).

4 > Privacy mode also allows for protection of data with only AES-256.



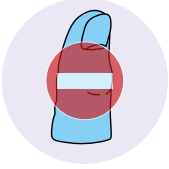


CBM-E4: best in series, best in class

Enhanced image quality

The CBM-E4's extremely fine-tuned design produces a fingerprint image with FBI PIV IQS certification.

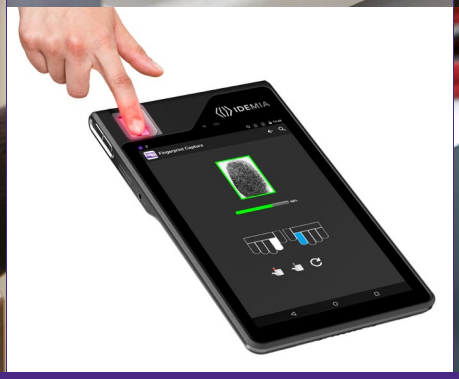
The reference standard in terms of single fingerprint image quality (equivalent to ISO 19794-4:2011 Annex B) was defined to ensure, in particular, interoperability between multiple solutions.



Fake finger detection

CBM-E4 detects 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.

Easy integration into a wide range of applications



The CBM-E4 is perfectly suited for swift integration into multiple devices and applications: ATMs, kiosks, vending machines, access control and time & attendance terminals, keyboards, printers, PoS terminals, alarm systems, mobile devices, safes, locker systems, remote controls, voting machines, etc.

Robustness

- IP65-rated sensing area (sealed against dust and liquids)
- Resistance to electro-static discharges, scratches, and shocks
- Operating conditions: -10°C to 50°C / 10% to 80% RH
- Storage conditions: -20°C to 70°C / 5% to 95% RH

Standard interfaces: USB and Serial (TTL Open-Collector)

Comprehensive Software Development Kit: MSO SDK

NB: Low-level protocol, ILV, is also available

Technical features

		CBM-E4		
		Standard	With IDENTLITE License	With IDENTPLUS License
Database capacity (users)		500	3000	5000
Database capacity (templates or fingers)		1000	6000	10000
Matching capability (1:N)		1:500	1:3000	1:5000
Matching speed		0.6s in 1:1 mode / 0.7s in 1:500 mode		
Fake finger detection		Yes		
Security layer		Optional		
Certifications	FBI PIV IQS / ISO 19794-4: 2011 (Annex B)	Yes		
	MINEX & FIPS 201 compliant algorithms	Yes		
	STQC	Available in 2025		
	CE, CB, FCC, UL	Yes		
	IP65-rated capture surface	Yes		
	RoHS, REACH, WEEE	Yes		
	Drivers	Win USB		