

# The G&D Biometric Toolkit

Secure and comfortable on-card fingerprint verification  
for all state-of-the-art smart card applications



Giesecke & Devrient

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The Biometric Toolkit is based on STARCOS® SPK 2.4, the market-proven, scalable multi-application operating system for smart cards with all the necessary functions for public key infrastructure.

## Biometrics

Biometrics is the science of measuring physical characteristics unique to an individual such as face, voice or fingerprint to verify a person's identity. Biometric characteristics can be described as something we are. The digital age is determined by PINs and passwords. But PINs or passwords can be forgotten, stolen or forged. This is why G&D is enhancing the security and acceptance of card use through the continuous development of on-card biometric processes.

## Fingerprint Verification

Fingerprint verification is not only the most prominent but also one of the most secure and well understood biometric measures. The characteristic information of one fingerprint contains up to 60 key points. The crucial key points where the finger-ridges

## Fingerprint Sensors

The STMicroelectronics TCRS1A fingerprint reader contained in the toolkit is a capacitive fingerprint sensor which cannot be fooled by a printed image or fingerprint. For setting up own applications, the fingerprint software was designed to support different sensors (e.g. Precise, Crossmatch, Veridicom, STMicroelectronics, Delsy, Omnikey and others).

## On-Card Matching

During the enrollment process biometric reference data is generated and stored on the card. In order to secure this data and to make it impossible for imposters to get access to this highly sensitive data, on-card matching was developed by G&D. Enabled by this technology the reference data can stay in the secure environment of

## Digital Signature

Security functions and personal keys can be secured with any combination of fingerprint and PIN verification to increase security and convenience for the user. The STARCOS® SPK 2.4 biometric card is a secure signature creation device, that can be legally tied to the cardholder with on-card fingerprint verification.

the chip card. To verify a person's identity, the finger has to be placed on a sensor, the characteristic features are extracted and transmitted to the card. Inside the card the two data sets are compared. The internal state of the card is changed and access to the application is granted according to the outcome of the on-card verification.

end or split up are local features called minutiae. They provide unique, identifiable information. The software converts the image of a fingerprint into digital form and extracts a set of characteristics – the template – from the user's fingerprint.



## The G&D Biometric Toolkit Technical Data

- Chip type: Philips P8WE5032  
8-bit microcontroller
- ◆ Verification of user's identity on-card
  - ◆ Personal data securely stored on the card
  - ◆ Any combination of fingerprint and PIN
  - ◆ Average processing time for on-card fingerprint verification 1-3 sec.
  - ◆ Fingerprint template size 2200 bytes
  - ◆ 24 Kbytes of free EEPROM for customer applications
  - ◆ On-card RSA key generation up to 1024 bit key length
  - ◆ Secret key operations: sign and decipher
  - ◆ Asymmetric authentication
  - ◆ Platform for digital signature applications
  - ◆ RSA sign and verify up to 1024 bit key length according to ISO/IEC 7816-8
  - ◆ Individual protection of cards against unauthorized terminals
  - ◆ Compliance with DIN (German digital signature law)
  - ◆ PKCS#11 compatible
  - ◆ ISO/IEC and EMV '96 compatible
  - ◆ Secure messaging
  - ◆ DES, DES-3 and SHA-1 algorithms on board
  - ◆ Multiple channels supported

## STMicroelectronics TCRS1A

- ◆ Combined capacitive fingerprint sensor and smart card reader
- ◆ Full speed USB interface
- ◆ Power consumption: 100 mA @ 5.5 v
- ◆ Dimensions: 44 X 69 X 32.5 mm, Cable: 1.8 m
- ◆ Image resolution: 508 DPI
- ◆ Active sensor size: 18 X 12.8 mm ( 256 X 360 pixels)
- ◆ ESD tolerant +/-15KV

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