Fingerprint Identification Module

Benefits

- Get to market quickly with a complete standalone authentication solution
- Leverage flexible design for integration into a wide variety of products
- Easily customize hardware and software to accommodate design needs



Target Applications

- ATMs
- Laptops
- PDAs
- Point-of-sale terminals
- Physical access products

Solutions for biometric products based on Texas Instruments DSPs provide developers the flexibility to design a wide range of products. By leveraging DSP programmability, low-power consumption and high-processing performance, developers can design highly accurate, differentiated products with customized features to meet changing market needs.

For developers of fingerprint authentication products, the Fingerprint Identification Module solution from Shimon Systems provides a TI DSP-based reference design. The main board includes a TI TMS320VC5507 DSP, memory, DC-DC power supply circuits, USB connector and LEDs. The sensor is located on the daughter card. This design approach allows support for other sensors by replacing the daughter card designed with a particular sensor. The main board may require some firmware modifications as image processing before matching varies for nearly all sensors.

System Example: Fingerprint Identification Module



Fingerprint Identification Module

Functional Description

Hardware

Captures fingerprint images and converts these images into digital templates

Stores digital templates

Authenticates users by matching fingerprint

Software

Enables the capture of images from the connected fingerprint sensor. In the case of sweep sensors (BIO-EM 310), the software collects several partial images which are stitched to form a complete image. For touch sensors (BIO-EM 200), since the complete image is received, there is no need for further stitching.

Once a complete image has been formed, the software extracts minutiae points. The number of minutiae points extracted and the speed of the process depends on several factors including the size and quality of the image, the specifics of the minutia point extraction algorithm and the speed of the processor.

The extracted minutiae points are used during the enrollment process to create a permanent template. During the authentication process, the extracted minutiae points are matched against the stored permanent template. The performance of the authentication software depends on the particular authentication algorithm used. The system has the capability to store a large number of fingerprint templates, so it can authenticate a large number of users.

While the system is designed to operate in a standalone mode, it can interface to a PC through a USB port for fingerprint registration and authentication.

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Component Selection

- TI DSP: TMS320VC5507_GHH
- TI Analog: TPS3307-18, TPS77701, TPS62000
- TI Logic: SN74LVC3G14, SN74ALVC244
- All Others: MT48LC8M16A2 (Micron), TE28F160B3T120 (INTEL)

Hardware

- Size: 50 mm x 76 mm x 10 mm
- Supply voltage: 4.00 VDC ---- 5.5 VDC
- Wattage
- Active: typical < 150 mA,
- Idle: < 5 mA
- Off: < 10 μ A
- CPU: TI TMS320VC5507
- Flash: 2-4 Mbyte
- Computing time: < 1 second for encoding and matching
- Host interface: USB (2.0)
- Indicators: Power, verification

Software

Several companies including the following provide software or algorithms which can be ported or implemented to run on the Shimon Systems embedded platform:

Fujitsu Microelectronics Inc. 1250 E. Arques Ave. Sunnyvale, CA 94088 Phone: 408.737.5600 www.fma.fujitsu.com

Neurotechnologija Ateities str. 10, Vilnius, Lithuania Tel: +370.5277.3315 Fax: +370.5277.3316 E-mail: info@neurotechnologija.com

123id P. O. Box 14906 Grand Forks, MN 58208 Tel: 701.775.4440 Fax: 701.775.4443 www.123id.us





BIO-EM 200



BIO-EM 310

Getting Started

Tools

- Software for fingerprint registration and matching
- PC-based GUI for test and evaluation

Documentation

User manual

Contact Information for Questions/Support

To purchase this solution or for more information: www.shimonsystems.com

Tech support: support@shimonsystems.com

Contact person: Baldev Krishan Ph.D., Baldev@shimonsystems.com