
FingerChip™ Demonstration Software

Release 13.00

Introduction

Congratulations for choosing FingerChip™ technology! No other technology will be able to offer such a small device with the best capture capabilities at such a low cost.

With the FingerChip™ demo software, the user will be able to acquire fingerprint images, to simulate a touchpad and much more.

This distribution concerns the V13.00 release of the FingerChip™ software and refers to FingerChip™ demonstration hardware kits FCSWEEP03 and FCSWEEP04.

When the demonstration kit is installed and the FingerChip™ hardware is connected, the user is ready to use the applications:

- FC_Training: FC_Training.exe grabs continuously fingerprint images
- FC_Mouse: FC_Mouse.exe uses the FingerChip™ as a touchpad
- FC_Parameters: FC_Parameters.exe allows the user to change FingerChip™ configuration
- FC_Demo: FC_Demo.exe is a more detailed application to acquire fingerprint images

The authentication software is not part of this installation but are available on request.



Biometrics
FingerChip™

Application Note

Rev. 2180A-BIOM-11/02





History

The following table shows the changes compared to the previous release:

Table 1. Comparison

Version	Description
V13.00	OHCI support Better detection of defective FingerChip™ Minor bug corrections
V12.00	ANSI C DLL API Error number clarification
Before V12.00	The history has been flushed.

Previous Installed Release

Before installation, it is recommended to uninstall previous version if any. Use the Uninstall windows capability in the Windows Control Panel or the installation software used to install your previous FingerChip™ software release, if uninstall is supported.

Note that the installation software will detect and propose to uninstall, but this is relevant only if this installation software had installed the current version. Use the installation software that installs the current version, to uninstall it. You will need to run the new installation software to perform the regular installation after uninstalling.

Perform uninstall also in the case of a broken installation.

Take care that the device is not connected while installation is performed.

If you have already installed the Release 11

This applies only to the Genesys USB interface. If the user needs to install V13.00 (or V12.00) release on a system which has 11.* installed, here is an effective way:

- Launch setup program to uninstall existing release.
- Plug the USB Genesys device.
- Remove the device using: 'Control Panel', 'System', 'Device Manager', select the device and 'Remove'.
- Unplug the device.
- Launch Windows Explorer, 'Tools', 'Find', 'Files or Folders', fill 'Named' (*) 'Containing text' (geneusb.sys) and 'Look in' (WINDOWS or WINNT directory depending on the Operating System), then click on 'Find now'. Take care that the hidden files are marked as visible.
- Remove the corresponding files named *.sys, *.inf, *.pnf.
- Launch the setup program to install 13.00 (or V12.00) release.

Plug the device. The driver is now automatically installed and the 13.00 (or V12.00) release is available.

First Installation

Refer to the following table to get the list of the supported operating system.

Table 2. Operating System

Operating System	Status
Windows 95®	not supported
Windows 98®	supported
Windows NT®	not supported
Windows 2000®	supported
Windows XP®	alpha test only
Linux and variants	not supported

Installation

Windows 2000 or Windows 98 are required for a proper installation:

1. Run the setup program. The setup will copy the drivers and install the applications in the selected directory. (Program Files\ATMEL-Grenoble\FingerChip\ is the default and recommended directory)
2. Connect your hardware to your PC. Windows will detect a new hardware on the USB interface and automatically install the driver.
3. Execute the FC_Parameters application to set the PART_NUMBER according to your device.

Once finished, run the FC_Training application to check if everything has been properly installed.

Installed Files

The Demonstration kit setup program installs the following files:

- FC_Demo.exe, FC_Mouse.exe, FC_Parameters.exe and FC_Training.exe in <TARGETDIR>
- FingerChip.dll in <WINSYSDIR>
- An33_appli.pdf in <TARGETDIR>\Documentation
- FCGene.sys (and Fcusb.sys for future use) in <WINDIR>\System32\Drivers
- FCGene.inf (and Fcusb.inf for future use) in <WINDIR>\Inf

where <TARGETDIR> could be C:\Program Files\ATMEL-Grenoble\FingerChip

<WINSYSDIR> C:\Windows\System

<WINDIR> C:\Windows

Trouble Shooting

Under Windows 2000, the demonstrator can not be used in user mode. The Administrator privilege is mandatory for driver installation, which is normal regarding the Windows 2000 security rule, but once installed, this high security level is still required to properly use the demonstrator.

The image quality is highly dependent of the USB load. The image acquisition requires nearly full USB bandwidth to achieve a perfect image quality. If you experiment acquisition problems while other USB peripherals are working, unplug these peripherals and restart acquisition.

API Changes

In release V13.00

The DLL API has changed to support a future USB interface, but this device is not available for the moment. In spite of these modifications, the binary compatibility of the API is preserved.

Some additional error numbers were added and the structures `t_FC_DeviceInfo` and `t_FC_SoftwareConfiguration` were modified. Developers can refer to Software Development Kit for the API details.

In release V12.00

The DLL API has changed to ensure an ANSI C compatibility. Actually, the boolean type used in the DLL API was specific, at least, to Microsoft Visual C++ compiler. These booleans, found in the code as 'bool', have been replaced by the char type. The DLL API binary compatibility is ensured (no need to recompile the application), depending on the compiler used.

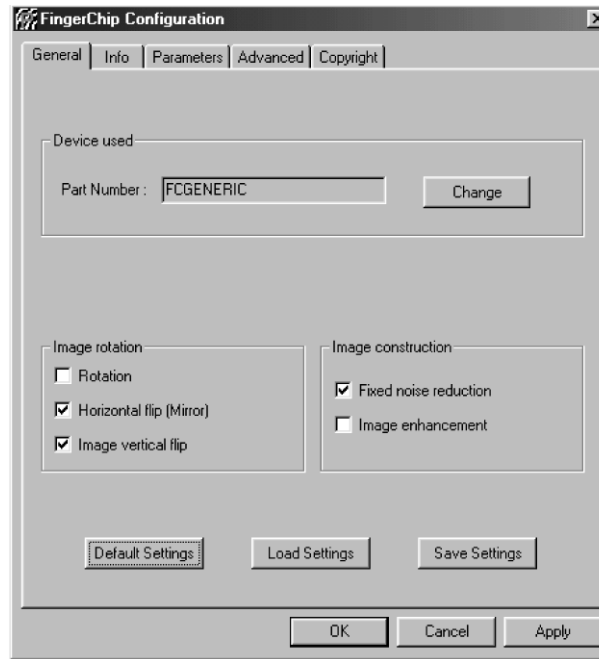
- For Visual C++ 5.0 or later compiler users, the 'bool' is implemented as a built-in type with a size of 1 byte. In a first time, the user applications do not need to be recompiled, as the DLL API binary signature is the same. But the first application recompilation will raise warnings such as "forcing char to bool: performance warning". At this stage, we recommend to change your application using the new DLL API definition.
- For Visual C++ 4.2 compiler users, the 'bool' is mapped on an integer, using a typedef. As the 'int' is 4 bytes large, your application is incompatible with the new DLL (this can cause memory corruption problems) and we highly recommend to change your application using the new DLL API definition.
- For other compiler users, make sure your applications comply with the new DLL API definition.

The modifications concern only the `t_FC_SoftwareConfiguration` structure.

FC_Parameters Application

This application allows the user to change default parameters for the FingerChip™ used (Part Number) and to configure the software for all applications based on this software. The parameters are shared within other applications. This means that the customer applications can acquire finger images, without providing control as it is achieved in the FC_Parameters application.

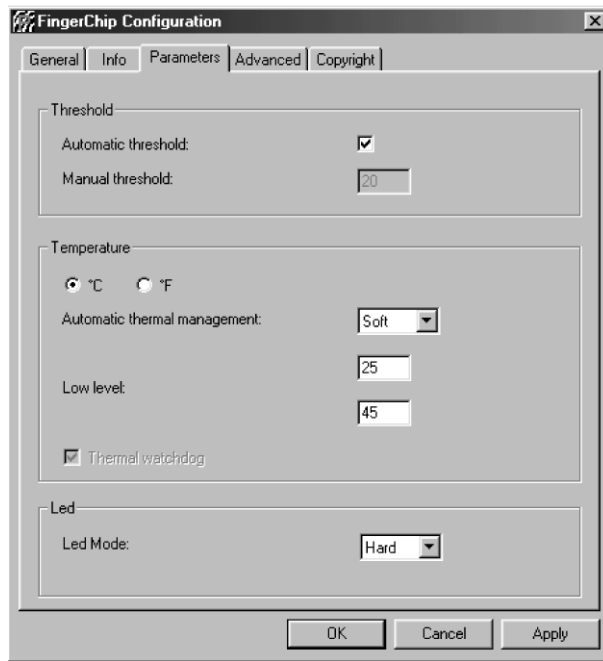
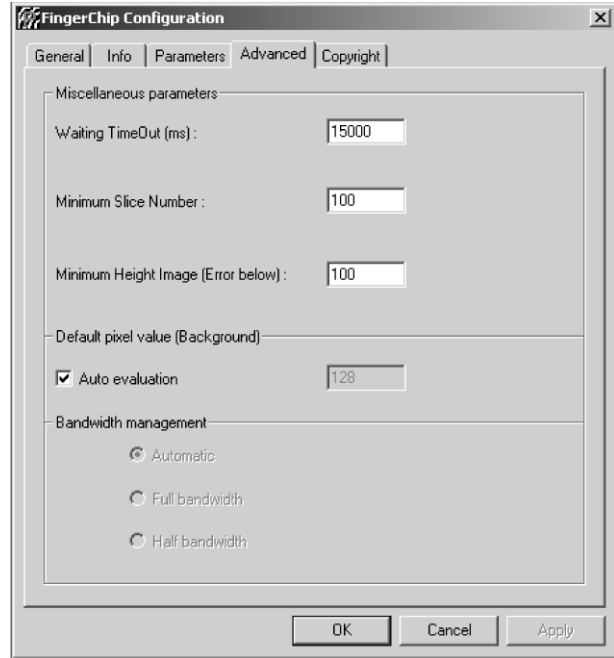
Note: the changes are written in Windows registers when all applications are unloaded. In this application, the greyed parameters are invalid and reserved for future use. Launch the application and choose the demonstrator Part Number and/or its dedicated parameters.



The “Default” button retrieves the default value for the Part Number chosen. If the selected Part Number does not correspond to one of the factory default Part Number, this button is not available.

The “Change” button allows changing the Part Number. Note that changing this parameter is equivalent to changing demonstrator profile. This can be achieved only if the device is not in use.

“Load” and “Save” settings allow you export and import all the parameters available in FC_Parameters application. You can easily change settings, from a profile to another.



Note: You can have help by F1. This document will open (PDF format).

FC_Training Application

This application allows to continuously grab fingerprints.

Launch the application and sweep a finger as often as desired. The fingerprint is displayed.



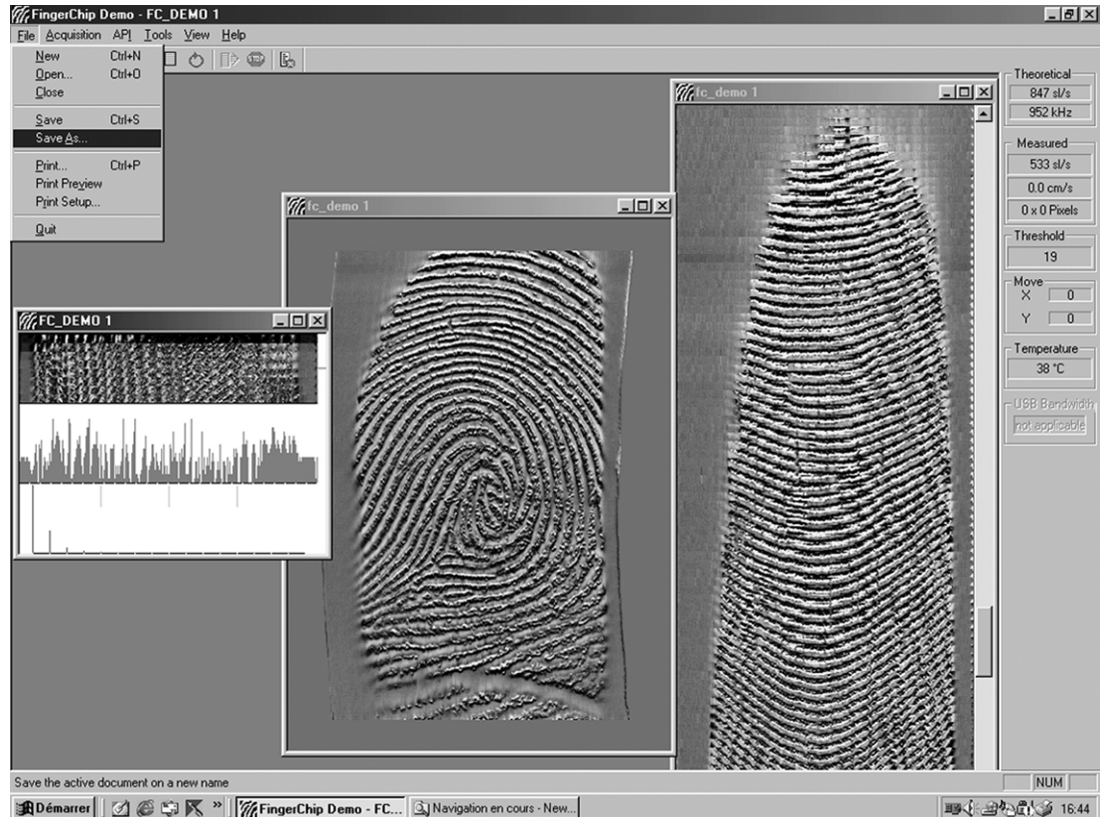
Note: The greyed areas such as «USB Bandwidth not applicable» are not valid information for the current device family.

FC_Demo Application

With this application, the user will be able to use the basic functions of the FingerChip™, save fingerprint images, see the original slices.

FC_Demo is a application which manipulates bitmap images. These objects are created by the acquisition and reconstruction functions or can be loaded from disk (.bmp files).

The greyed areas such as «USB Bandwidth not applicable» are not valid information for the current device family.



Menu Bar

File Menu

The user will find in this menu all generic functions he is used to find in a “File” menu concerning the management of the files, the closing and printing of the application.

Acquisition Menu

The acquisition menu gathers the complete functions of the software. The result of these functions doesn't need further treatment.

API Menu

The API menu allows testing all basic functions of the FingerChip™ demonstration toolkit. It can also configure the software and the hardware.

Tools Menu

The tools menu contains a link to the FC_Parameters application and local software configuration. Note that FC_Parameters is fully independent.

View Menu

The user will find in this menu all generic functions to manage Toolbars and Status bars.

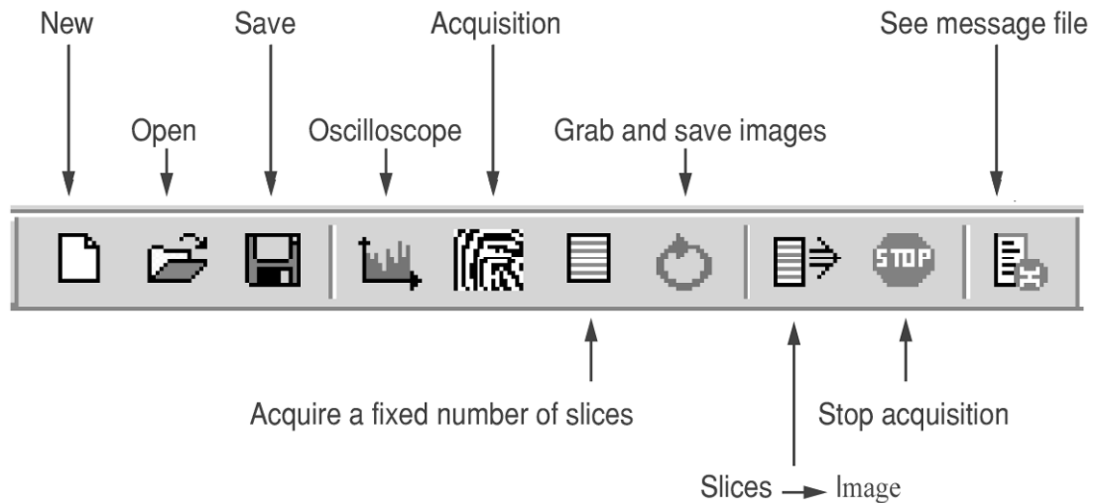
Help Menu

The help menu provides the information about the authors and the legal information of the software.

A help PDF file is also accessible.

Toolbar

The toolbar allows to easily access some of the functions detailed in 'Menu Bar' section. These functions correspond to the current use of FC_Demo. See the menus for more functions.

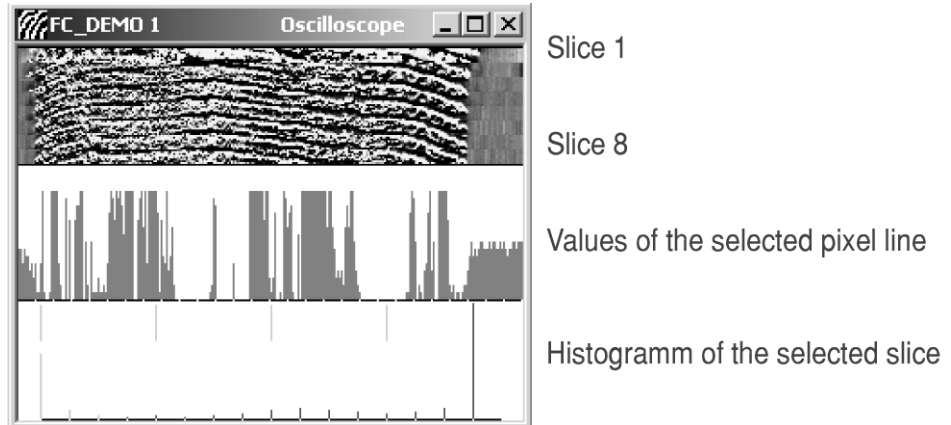


Acquisition Menu

Oscilloscope (F2)

This function captures continuously 8 slices. It also displays pixels values of one horizontal line and a histogram of grey colors dispersion.

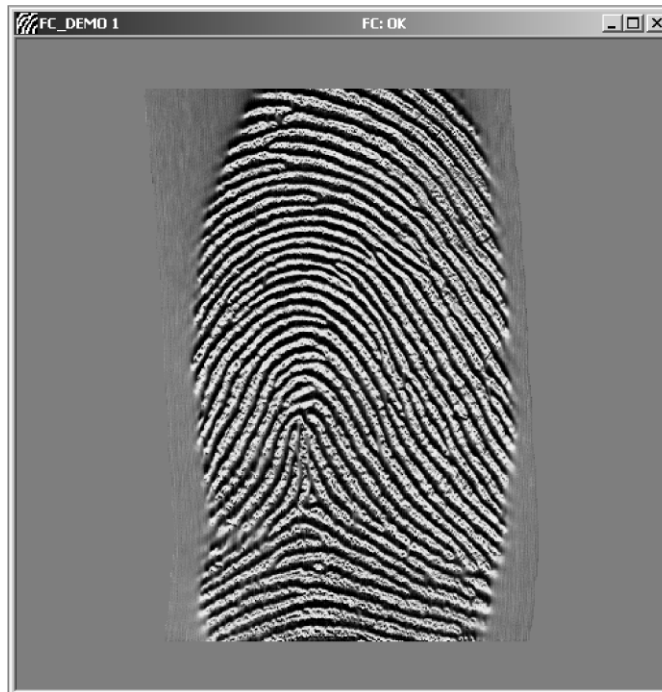
By upper and down arrow, the user can select the horizontal line he wants to see.



Acquisition (F3)

This is a full function, which grabs a fingerprint.

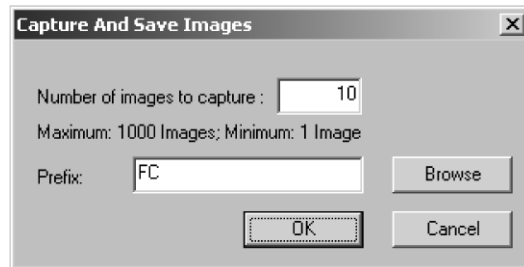
Select "Acquisition" and sweep your finger, your fingerprint is displayed.



Note: because of the reconstruction on the fly by slice packets, the source slices are not stored in memory, thus it is not possible to see them.

Grab and Save Images

This function allows acquiring and storing a fixed number of fingerprints. First the user selects the image number and the location of the saved images.



Then, the user sweeps his finger to obtain all the images.

Slices «Image»

From a slice acquisition (First it is required to get an image of slices), this function reconstructs the fingerprint. A window contains the fingerprint and a second the initial image of slices.



Note: if the demonstrator is plugged on an UHCI port, every about 400 slices, a slice can be a little more contrasted. This is due to UHCI request management, which leads to integration time irregularity in the slice acquisition.

Stop Acquisition (F4)

When one of the others functions is too long, or if the user wants to cancel an acquisition, you may press 'Stop acquisition'. This will stop continuous functions (as 'Oscilloscope' and 'Grab and save images').

API Menu

Open Device

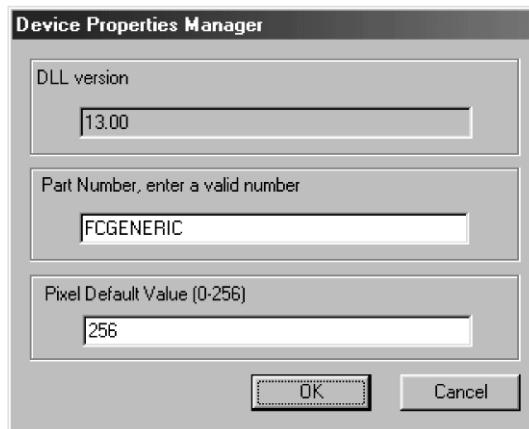
This basic function declares a user. Note that there may be only one user connected at a time. See the error codes documentation for more information about the returned code.

Close Device

This basic function declares that the current user will release the pre-emption.

Store Device Information

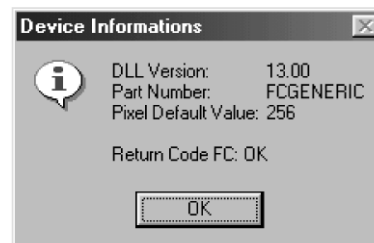
This basic function retrieves the device information (DLL Version, part number, and default pixel) and allows the user to change some of them. DLL Version can't be changed.



This information can not be modified if a device is active. The direct consequence is that the function `FC_SetDeviceInfo()` returns an error code 'FC_Busy' if the device is open. To solve this problem, you must close the device (`FC_CloseDevice()`) before using `FC_SetDeviceInfo()`.

Retrieve Device Information

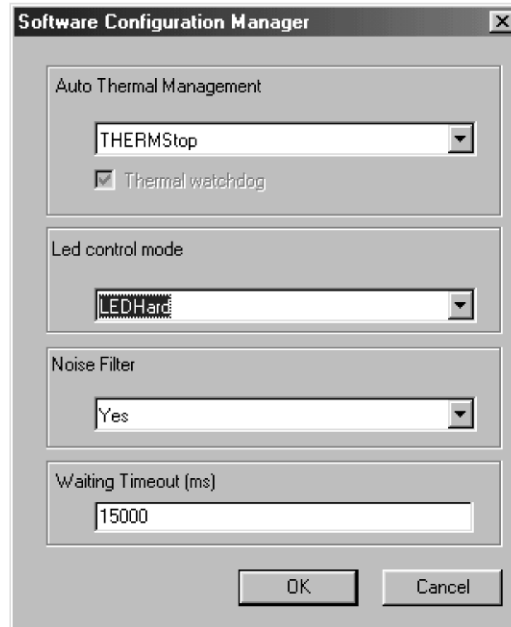
This basic function displays information of the selected device.



Store Software Configuration

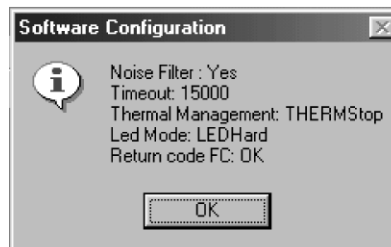
This basic function retrieves the software configuration and allows the user to change some of them:

- Thermal management mode
- Led control mode (only one value available)
- Noise filtering mode activation
- Waiting timeout (ms)



Retrieve Software Configuration

This basic function displays information of software configuration.

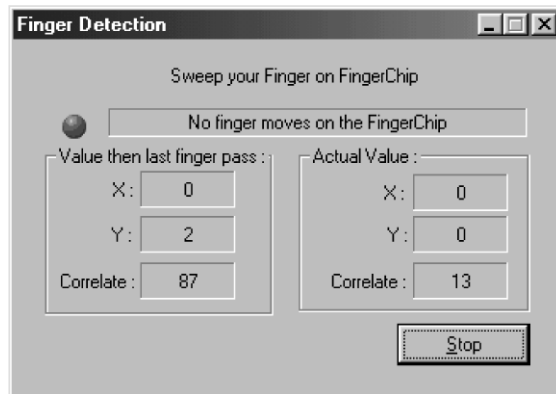


Get Image

This function is the same as "Acquisition Menu: Acquisition".

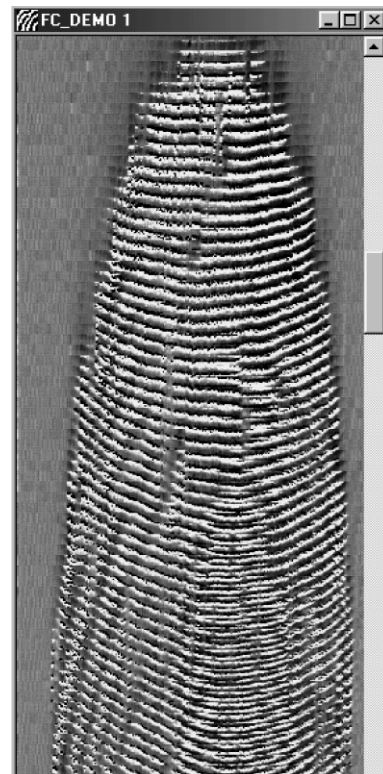
Test Finger Presence and Displacement

This function detects displacement on the FingerChip™ and updates information displayed below:



Acquire a Fixed Number of slices

The user has to select the number of slices and then acquires the slices.



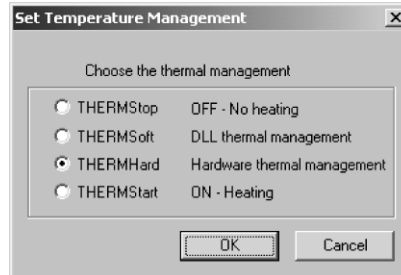
Reconstruct Image from Slices

This function is the same as "Acquisition Menu: Slices->Image".

Set Temperature Management

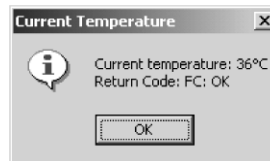
The user can select four options to manage the temperature:

- Always heat
- Stop heating
- Temperature managed by software
- Temperature managed by hardware (not provided yet)



Retrieve Temperature

The user can read the FingerChip™ temperature by this function:



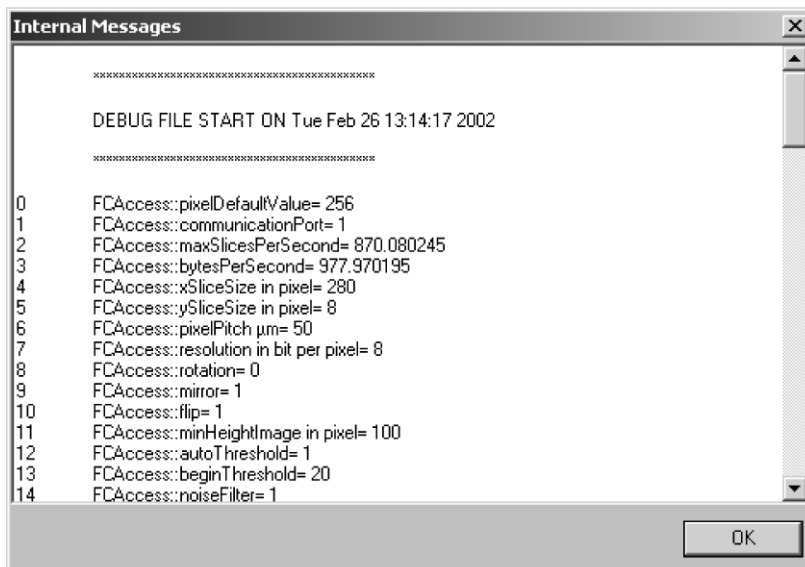
Configure Message File

This menu allows the user to enable or disable debug file information. The option is disabled by default.



See Message File

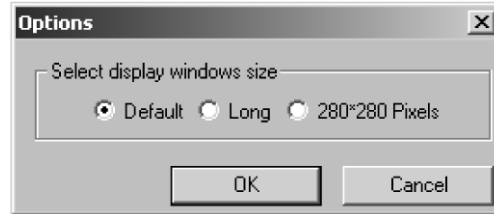
This function displays the debug file.



Tools Menu

Options... (F10)

The first selection field, "Select display windows size", concerns the size of the next window the user will open. Note that most of the windows opened are automatically resized.



FC_Parameters

Launch the FC_Parameters application in order to configure software and FingerChip™ device.

Help Menu

About

Information about this application is displayed:

Contents (F1)

With this menu, the user can reach this application note file (PDF format).

Hotkeys

The user can launch functions described below by hotkeys:

- F1: Help
- F2: Oscilloscope
- F3: Acquisition
- F4: Stop acquisition

FC_Mouse Application

This application uses the FingerChip™ as a touchpad. The red circle follows the user finger displacement. The aim is to move the red circle towards the black one.

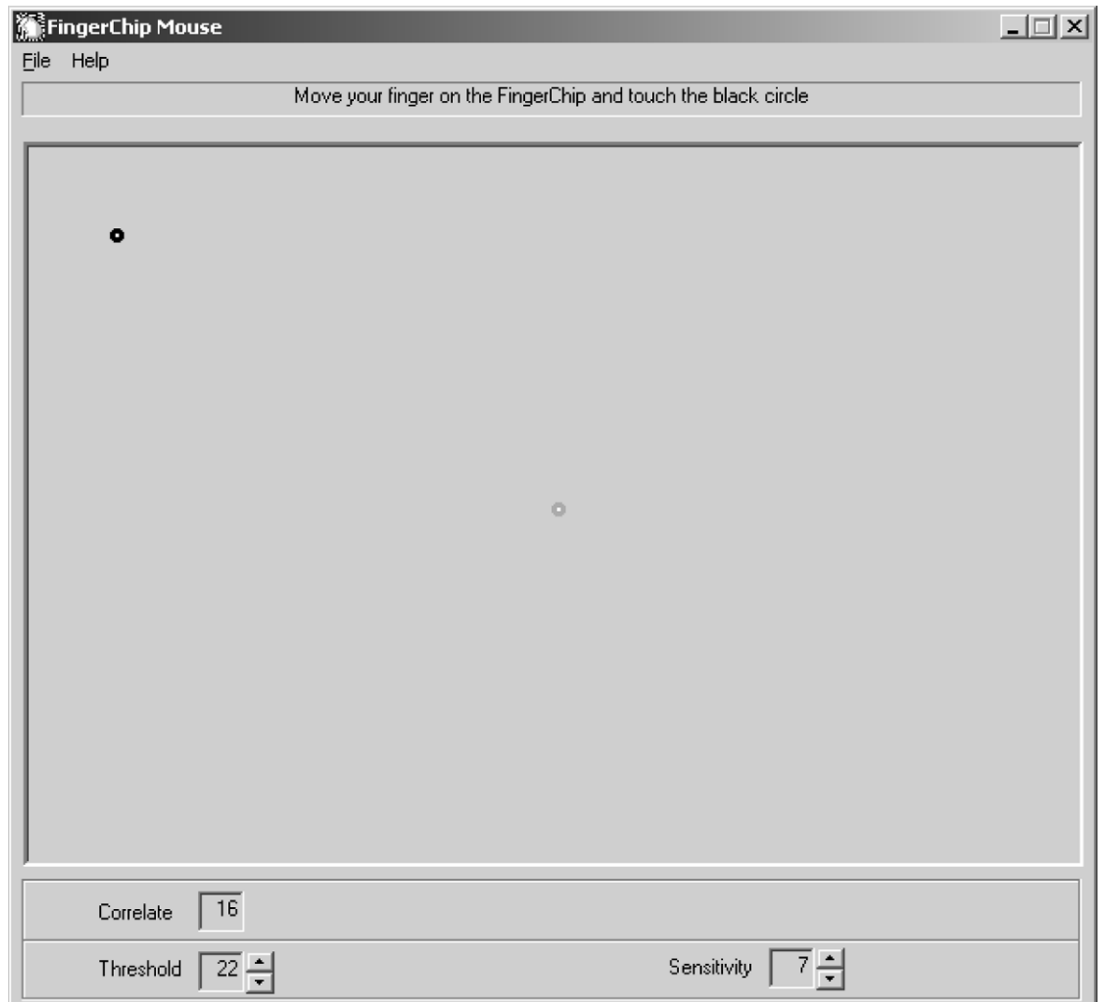
For this application you can modify parameters:

- Threshold = Finger detection threshold
- Sensitivity = Magnification for circle move vs finger move

Each time a displacement is detected, the information “Correlate” is displayed. This value means “Current finger detection correlation value”.

Launch the application and move a finger on the FingerChip™ to touch the black circle.

When the red circle touches the black circle, the black one changes its position.





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