CMITECH

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BMT-20

User Guide

The Widest Capture Range

High Quality Iris Image (ISO19794-6)

350-380mm

Optical Path Distance 350-380mm

High Performance (< 1sec)

Contents

Introduction

This document describes the **BMTDemo.exe** demo application for CMITECH's binoculars type dual iris image capture device, theBMT-20. This program was written using Digia's Qt (version 4.8.4, Commercial License) and OpenCV (Version 2.4.2) with Microsoft Visual Studio 2010SP1 C++, which requires QtCore4.dll, QtGui4.dll, opencv_core242.dll, opencv_imgproc242.dll, opencv_highgui242.dll and opencv_objdetect242.dlllibraries. Please make sure that these libraries are located in the right path. As for the OpenCV Software License, please refer to "Open CV_License.pdf" contained in this directory. The source code of BMT Demo.exe, which can be utilized as sample code, will be available in the main CMIRIS SDK, provided separately.

The USB driver should be installed correctly before running **BMT Demo.exe.** Please refer to the Driver Installation Guide document for instructions.

Start

PC & OS Requirements

BMT-20 requires a USB2.0 High Speed connection with the host PC. The minimum PC configuration that this demo application had been tested on was an Intel® Atom™ CPU model N5700running at 1.66GHzwith2GB RAM and the Windows7® (32-bit)OS. Table. 2-1 lists the supported Operating Systems.

Table2-1. Operating System Supported by BMTDemo.exe

Operating System	Version	Edition	Service Pack
Windows XP	32-bit	All	SP3*
	64-bit		
Windows 7, 8 and 8.1 and 10	32-bit		All
	64-bit		

*Hotfix for Usbehci.sys(http://support.microsoft.com/kb/969238) should be installed

Installation Directions

A The USB driver should be installed correctly before running BMTDemo.exe. Please refer to the CMITech Driver Installation Guide for the USB driver installation. Ensure that the correct version (x86 or x64) is installed for your machine. Note that x86 (32 bit version) will run properly on 64 bit machines.

B For all OS versions, it is also necessary to install the appropriate Microsoft Visual C++ 2010 run-time package, which can be found in the directory /Windows redistributable packages/Microsoft Visual C++ 2010 SP1 Redistributable Package. Again, the version must match the bit configuration of the PC

C The hotfix for Usbehci.sys **(http://support.microsoft.com/kb/969238)**needs to be installed for a Windows XP machine. This hotfix can be also found in the sub-directory/Windows USB Hotfix for XP SP3.

Running the BMT Demo Program

Double-click the BMT Demo.exe executable file in the directory /VS2010/xxx/bin. As a recommendation, you can create a shortcut to this application, and place in convenient location, like the Windows Desktop. The initial window will show up as in Fig. 3-1 (“Main”tab). Fig 3-2 shows the options window when you click the “Options”tab.

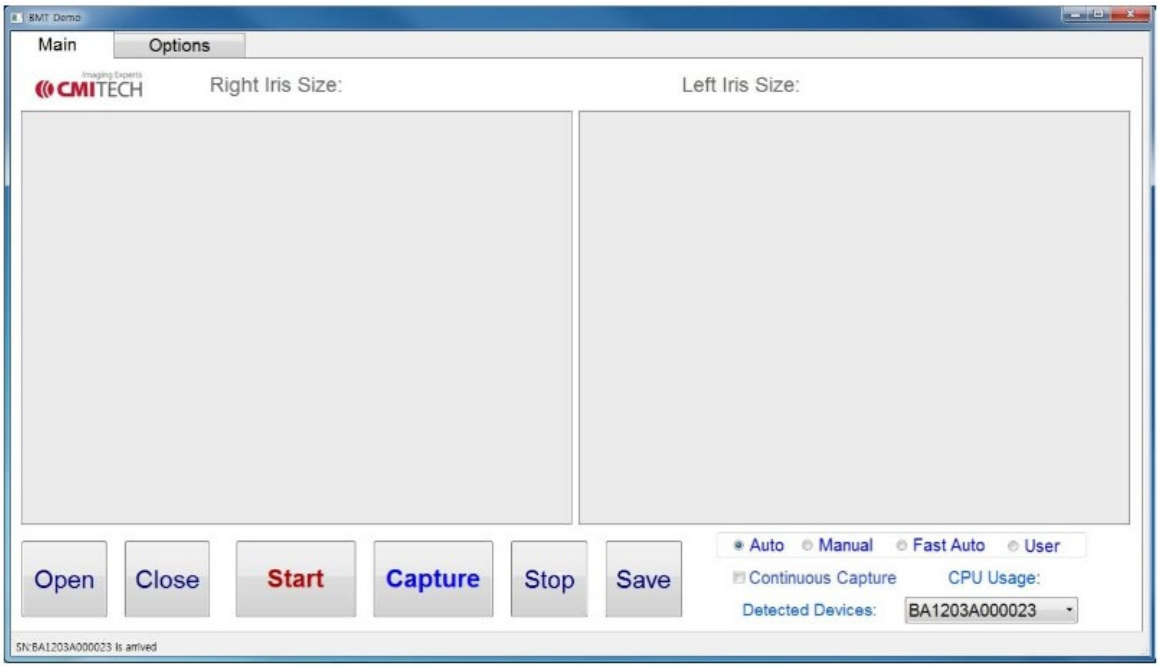

Fig. 3-1 Initial Window – Main tab

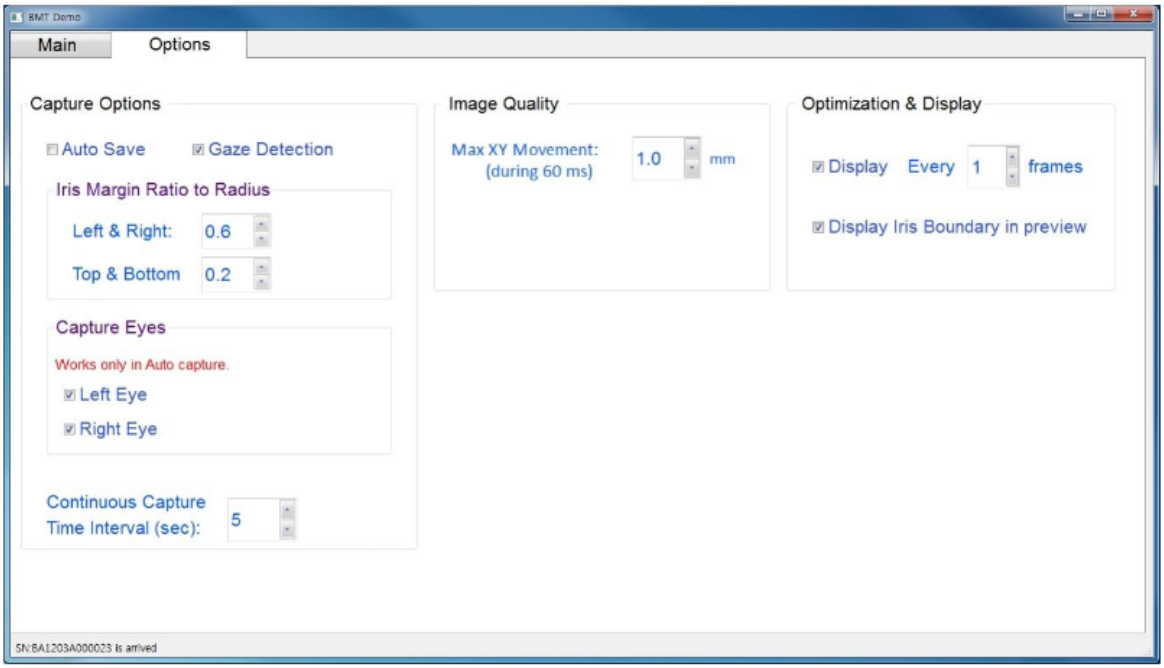

Fig. 3-2 Initial Window – Options tab

When BMT Demo.exe starts, it will scan the USB ports to detect BMT-20 devices. If it finds the devices, it will populate the serial numbers in the combo-box in the right-bottom corner. In Fig. 3-1, the serial number of the detected device was "AA1203A000011". If multiple devices are detected, it will show all the serial numbers found in the combo-box and each serial number can be selected to open. It should be noted that only one device can be open at any time. If the connected device is removed or a new device is connected, the combo-box will be updated automatically.

Click the "Open"button to connect the demo application to the device. Once the device is open successfully, the background color becomes light blue with the message "Device open successfully" in the status bar as shown in Fig. 3-3.After being successfully opened, it will show the model name (BMT-20) at the top right corner.

If the Open function fails, the background color will remain as white with a pop-up error message. If the Open function fails, disconnect the USB cable and reconnect before retrying. If it doesn't solve this problem, please contact CMITech.

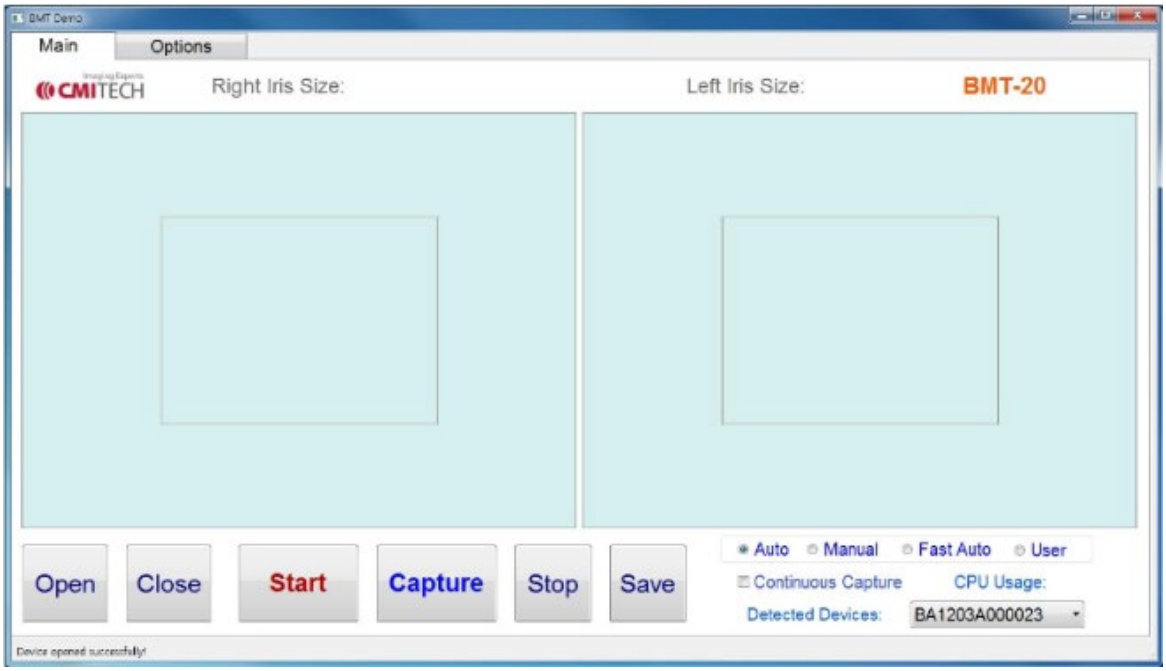

Fig. 3-3 Successful Device Open

The “Start” button will initiate the iris image capture process. The live images of both eyes will be displayed as in Fig. 3-4, Fig. 3-5 and Fig. 3-6. If the checkbox of “Display Iris Boundary in preview” in the Options tab is checked, you can see a color circle of iris boundary in each live image. If the location of each iris is too high or too low, the color of quadrangle becomes red. If the iris margins satisfy the requirements set in “Options” tab, the quadrangle will change to green

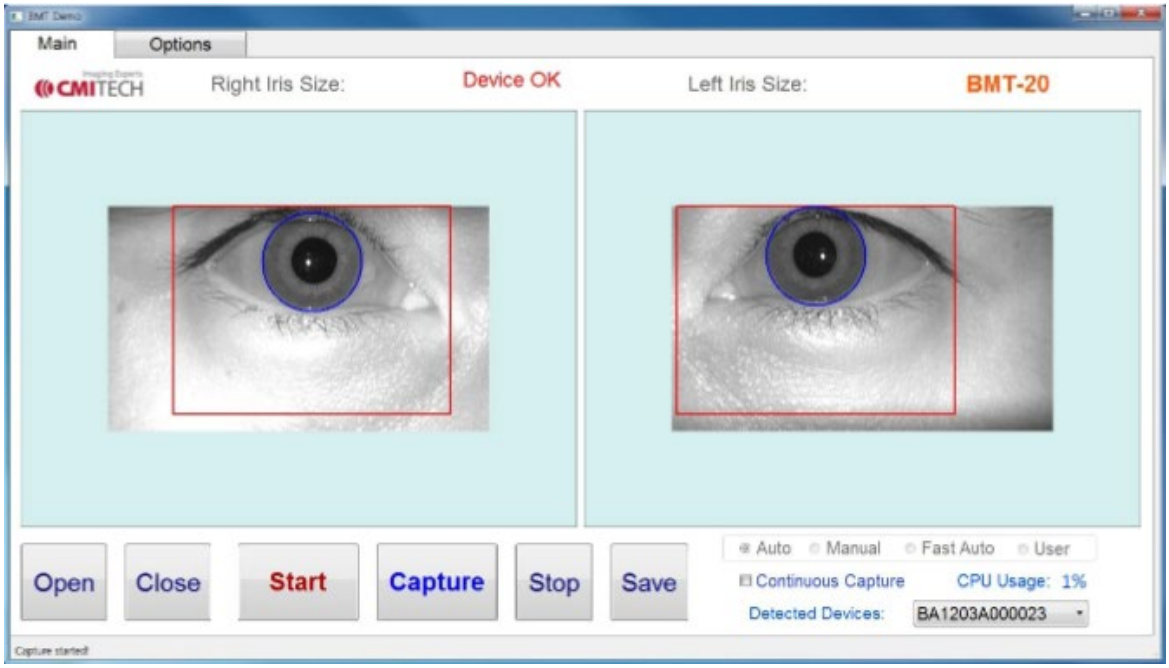

Fig. 3-4 Live Image Display - too high

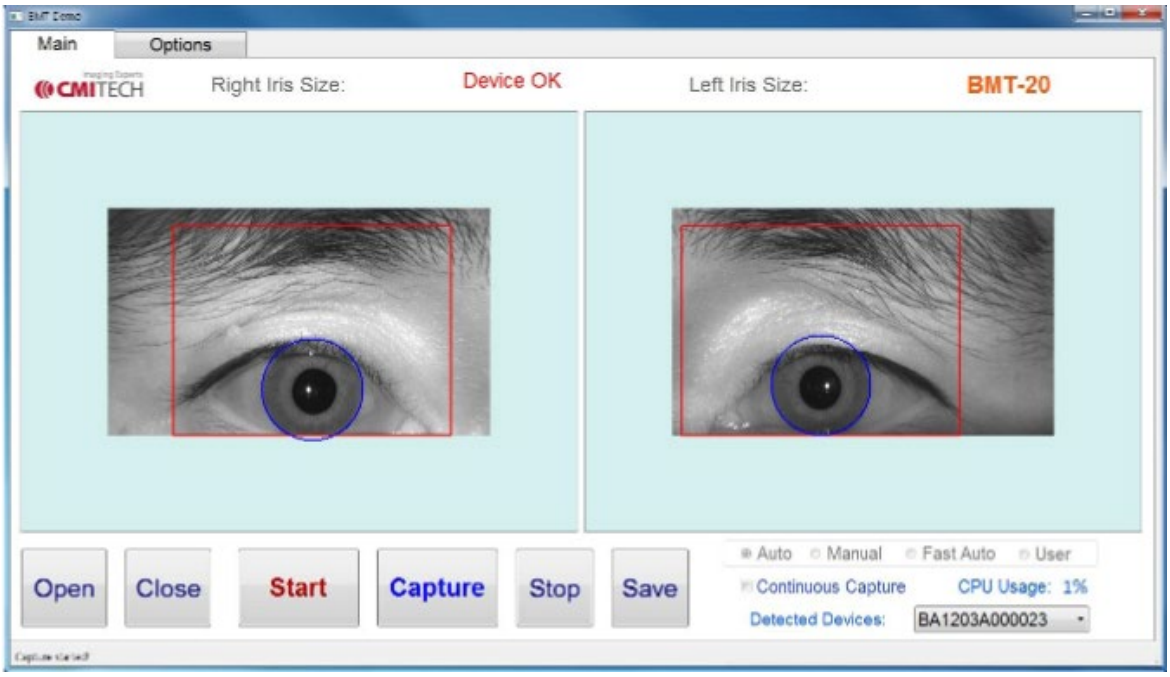

Fig. 3-5 Live Image Display - too low

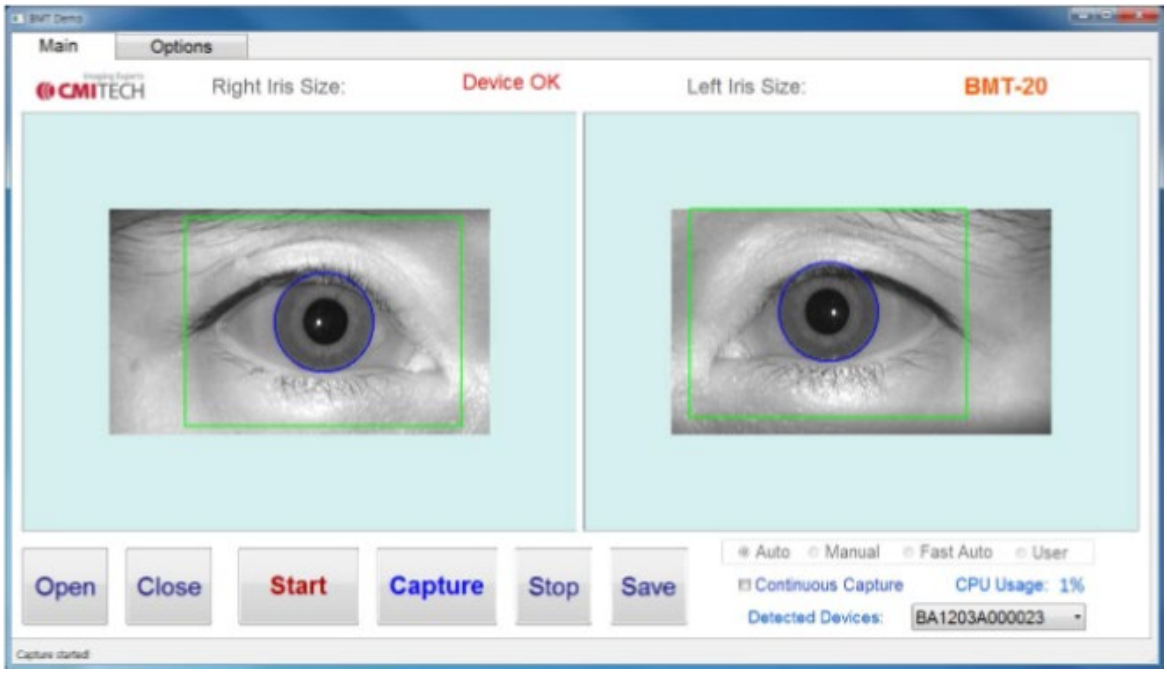

Fig. 3-6 Live Image Display - good eye positioning

If the Iris Image capture is successful, the process will automatically stop. Fig. 3-7 shows a window with a successful capture. If “Continuous Capture” check box is checked, the capture process will start automatically after the time interval set in the edit box, “Interval”, in the “Options” tab. Minimum time interval is 1.0 sec.

The Capture button will turn on the white LED inside BMT-20(which will shrink the pupil to allow more iris area to be exposed), and force the capture the images. Before capturing images, it will wait until the white LED has been on for more than 0.5 seconds.

Stop button will just stop capture process and Close button will disconnect the device. The background color of image display area will be changed back to white after close.

Save button will save the selected Right and Left captured iris images (plus unselected images) in .bmp for matin the sub-directory /Images with the following naming convention. The images cannot be saved after Close. Enabling “Auto Save” will save two selected images automatically after each capture is completed, but it does not save the unselected images

Example filename of selected Iris Image :
2011.04.25_12.17.10_REYE_C320_239_R126.bmp.

- 2011.04.25_12.17.10: Year, Month, Day, Hour, Minute, Second.
- REYE: Right eye
- C320_239: Iris Center is (320, 239)
- R126: Radius is 126 pixcels

Example filename of unselected Iris Image :
2011.04.25_12.17.09_REYE_C-1_-1_R-1.bmp.

- 2011.04.25_12.17.09: Year, Month, Day, Hour, Minute, Second.
- REYE: Right eye
- C-1_-1_R-1: Iris Center and Radius are invalid

When “Gaze Detection” in the Options panel is checked, the gaze detection parameter is enabled. To test, if you move your eyes off-angle prior to capture, the system will not permit capture of the iris images.

The fast auto capture mode does not wait for pupil contraction but captures iris images whenever the subject is not moving. This mode maybe useful for certain authentication applications.

If “Manual” is checked in the capture mode, it will not capture iris images until the “Capture” button is clicked. The white LED will be on all the time in the Manual capture mode

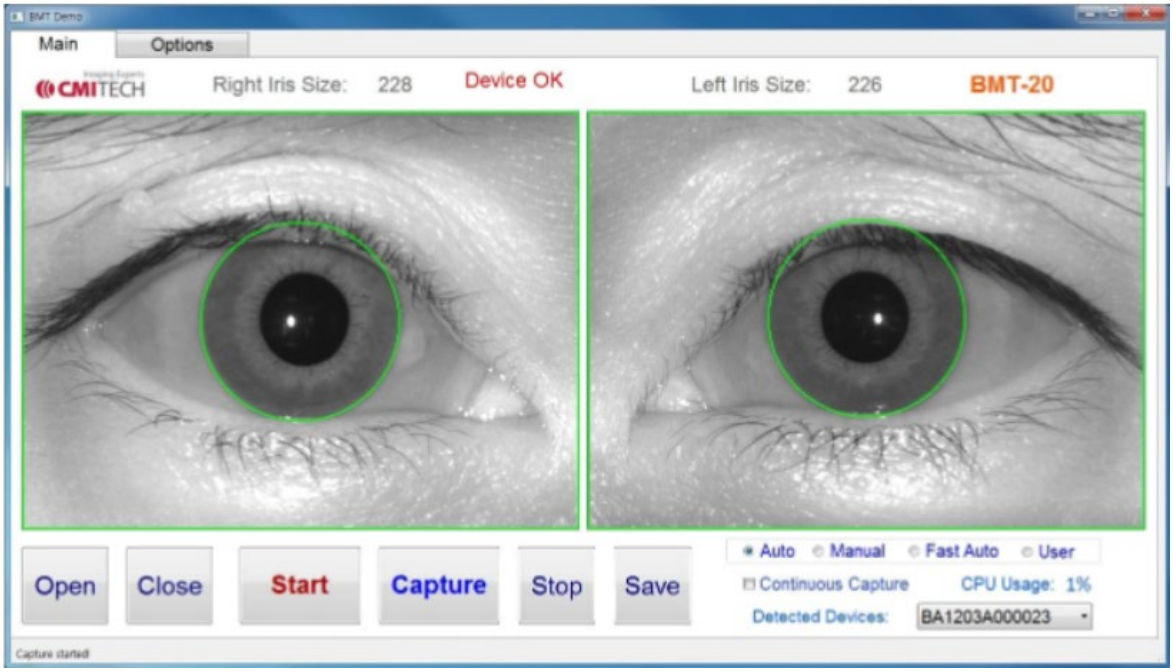

Fig. 3-7 Capture Window

If the device is upside down, the message “Device OK” on the top in Fig. 3-7 will change to the message “Device Upside Down” and blinking. The image capture will be disabled if the device is upside down.

If you select “User” mode, white LED will turn on if the eyes are detected and not moving.

It will wait about a second until the pupils are contracted and then capture the iris images. If the subject moves during this waiting period, the white LED will be turned off and the capture process will start over.

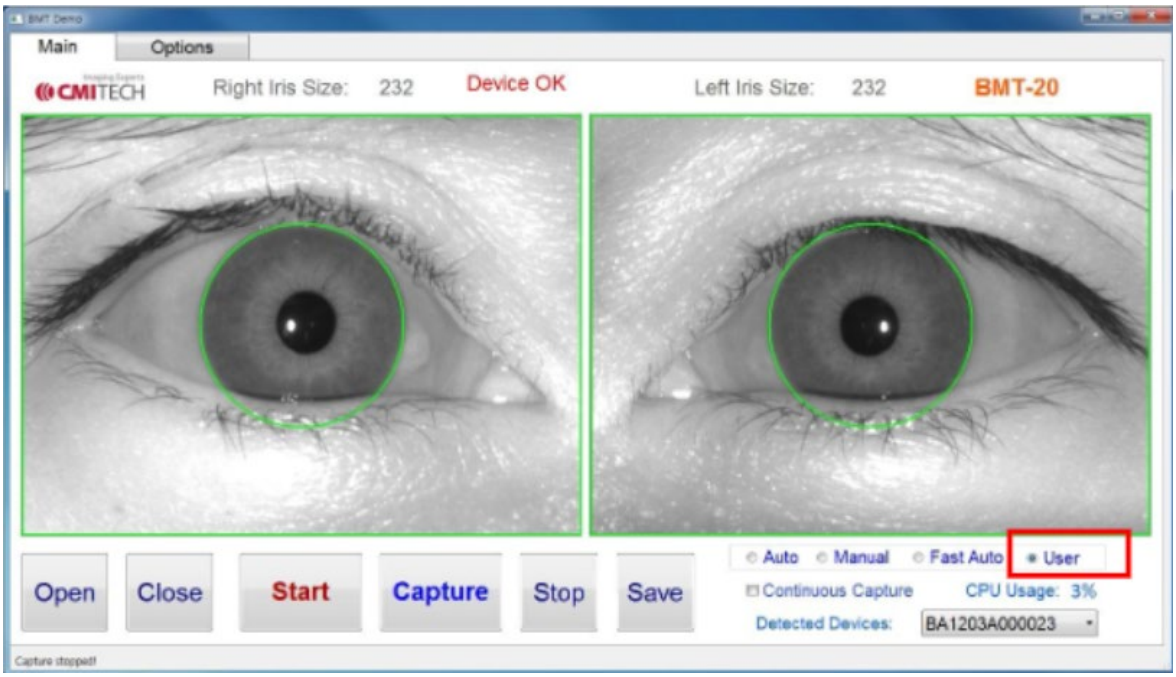

Fig. 3-8 User Mode Capture

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