BMT-20™ Iris Recognition System

Binoculars-type simultaneous dual eye system
with power-over-USB

APPLICATION

For large scale enrollment programs demanding highest throughput and iris image quality

Product Description

The CMITech BMT-20 is a binoculars-type iris biometrics imaging device that quickly captures highest quality iris biometric images. Exceeding industry standards for image quality, this system optimizes matching accuracy, essential in very large scale deployments for which de-duplication is a core deliverable.

Easy to use, the system can be reliably positioned by the subject with minimal instructions, or by an operator with the aid of positioning feedback LEDs on the top of the imager's housing. The patent-pending optical design of the BMT-20 includes expanded depth of field and a very large interpupillary distance range, providing effortless capture for subjects of all ages. Intended for applications in which subjects have limited prior experience with biometrics devices, the BMT-20 is ideal for enrollment programs of all sizes, including those involving very young children.

The depth of capture, or focal range, of the BMT20 system is 30 mm, which covers all subjects in any population. The operator simply places the forehead bar of the BMT-20 on the subject's forehead, and the captured images will always be in focus. This means that the BMT-20 does not need to be repositioned manually to adjust focus. Contact of the system with the subject's forehead also always prevents direct ambient light from entering the optical path so that the BMT-20 can be used outdoors in direct sunlight without any problems.

Designed with the latest in optical and system control technology by one of the leaders in the industry, the BMT-20 is physically robust, highly reliable and durable. Meeting the elevated IP64 intrusion protection standard, the system is sealed against dust and other airborne particles to provide extended life in harsh environmental conditions.

Key Features

Feature	User Advantages
State-of-the-art optical design	The optical design utilizes highest quality optics and a long internal optical path. This allows the BMT-20 to exceed industry guidelines for image quality as specified by ISO 19794-6 and 29794-6 standards and India STQC, which sets a specification of 4.0 lp/mm at 60% contrast ratio.
Single sensor design	The proprietary and patented single sensor design interleaves left and right iris images for simultaneous capture. By utilizing only a single sensor, power consumption through the USB connection is minimized. This allows for optimized NIR illumination, resulting in the shortest exposure times possible, thereby minimizing any potential for motion blurring.
Long internal optical path	The optical design is folded within the BMT-20 system, providing the longest optical path of any binoculars-type iris recognition imager. At 365 mm (+/- 15 mm), the long optical path provides much greater depth of field while minimizing optical distortions.
Dedicated, on-board image processor supports very high speed, simultaneous capture of subject's irises	In real-time coordination with the host PC software, the on-board image processor facilitates very high speed image capture, resulting in the fastest and most robust capture of both of the subject's irises at the same time. Typically, both irises are captured within one (1.0) second from the time that the subject places the system on his / her forehead.
Extended depth of field	The BMT-20 is capable of imaging over a depth of 30 mm, making the system highly tolerant of a) subject positioning in the "Z" dimension and b) how deep the subject's eyes are relative to his / her forehead. The BMT-20 therefore offers highly robust iris imaging across the widest range of people, including small children.
Wide inter-pupillary distance tolerance	The BMT-20 can capture iris image pairs from subjects with inter-pupillary distances as small as 4.0 cm, which is the minimum distance for a child of 5 years old. This makes the BMT-20 ideal for enrollment of all subjects within all national identity programs.
All solid-state design—no moving parts	The superior optical design of the BMT-20 provides the widest interpupillary distance and depth of field without needing any moving components. Reliability and durability are optimized with an all solid-state design.

Feature	User Advantages
Meets IP64 specifications for particulate intrusion prevention	Meeting this very high standard means that the BMT-20 is highly resistant to contamination by the very small airborne particles such as dust and dirt that are commonly found in harsh non-conditioned enrollment environments. Meeting this standard extends product life and offers highest reliability. Other systems only meet the lesser IP54 specification.
Near-real time off-axis gaze detection	Capturing the correct position of the eyes is essential for optimal iris biometrics. The system automatically detects subject gaze angle (i.e. whether the subject is looking directly ahead at the imager). If the subject is looking away, the system will automatically wait until the subject looks straight ahead before capturing a valid iris biometric image.
Internal white LED	Internal white light emitting diodes (LEDs) are turned on just prior to imaging. Constricting the subject's pupil provides ideally sized pupils for optimal iris biometric identification and authentication. In dark rooms, the pupils of most subjects will dilate, shrinking the amount of iris area, which diminishes the effectiveness of the iris biometric image. By making the iris area larger, the iris biometric images are optimized.
Motion detection	System detects eye motion relative to the system, and waits until subject meets motion threshold (which is adjustable), thereby minimizing motion blurring of images.
Foldable side visors and forehead positioning rest	Side visors and the forehead positioning aid on the BMT-20 block bright light, including direct sunlight, from entering the optical path of the system during imaging. In this way, the BMT-20 will deliver ideal iris biometrics imaging, even when operated outdoors.
External color LED positioning indicators	The BMT-20 can be operated in two modes: either by the subject or a trained operator. Subjects are given short and easy to understand instructions. Operators center the system over the subject's eyes, based on the following external color LED's: • Red: Device is too high • Blue: Device is too low • Green: Device position is OK
Position sensor	A gyro sensor detects if the system is upside down, preventing capture of images that can be reversed, left and right. This ensures that all iris biometric samples are exactly as intended.

Feature	User Advantages
High temperature range	The tested and certified operating temperature range of the BMT-20 is a full 0 to 50 degrees Celsius, making the system fully useable in non-conditioned environments, even in the hottest of summer days.
Powered by USB 2.0 cable	The BMT-20 can operate without an independent power supply. It is fully powered by the USB 2.0 connection (maximum 500 mA at 5.0 V).

Technical Specifications

Dimensions	219 x 161 x 58 mm (8.6 x 6.3 x 2.3 inches)
Weight	680 g (1.5 lbs.)
MTF / spatial resolution	Exceeds 4.0 lp/mm @ > 60% contrast
Pixel resolution	18.4 to 20 pixels/mm
Iris image pixel resolution	640 x 480 pixels
Image output	Meets or exceeds ISO 19794-6
Optical path distance	350 to 380 mm
Depth of field	30 mm (1.2 inches)
Inter-pupillary distance range	40 to 90mm (1.6 to 3.5 inches)
Time of capture	Typically about 0.5 second, from time of head placement
IR illumination for iris imaging	ISO recommended best practices dual LED: wavelengths of 850 nm nominal (~ 60%); and 750 nm nominal (~ 40%)
Internal LED for pupil contraction	Broadband visible (white)
External LED indications for operator assisted positioning	Red: Device position is too high Blue: Device position is too low Green: Device position is OK White: Image capture in progress
Operating temperature range	0 to 50˚C
Humidity	10 to 90% RH, non-condensing
Eye safety standard	IEC 62471, IEC 60825-1
Environmental	Meets IP64 standard for intrusion prevention (water and particles)
Interface	USB 2.0 High Speed
Power	USB 2.0 (500 mA at 5V) No additional power required
PC hardware requirements	PC x86 or x64 platforms: Intel® Atom™ or above equivalent processor (either 32 or 64 bit) ARM: Cortex A9 quad core processor
OS compatibility	Windows 7, 8, 8.1 and 10, both 32 and 64 bit versions Linux Ubuntu 12.04, 14.04 and 16.04 LTS Android 4.0 and above
Other certifications	CE , FCC, USB-IF, India STQC, RoHS, WHQL

Contact Information

Please contact CMITech or your representative for more information about the BMT-20 and its Software Development Kits (SDK) and other supporting software.

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