

EF-45™ Iris Recognition System

Innovative face-display positioning provides outstanding ease-of-use at capture range of 35 to 45 cm



APPLICATION

Compact wall mountable and desktop terminal for access control, time & attendance, and general ID management applications

Product Description

The EF-45 next generation dual iris imaging system provides unprecedented subject ease of use through a highly innovative and intuitive user positioning approach. Subjects will view their own face in a front-facing, high resolution 5.0 inch color display to position themselves correctly within the real-time graphic interface. They will intuitively and naturally move to the correct position by simply centering and sizing their face image to the box within the display. In addition, the positioning box and the top border turn green to indicate proper distance positioning, after which the iris biometrics images are automatically collected, provided that the real time image quality metrics are satisfied. Vocalized commands give additional positioning guidance in real time.

In addition, this system features an expansive capture range of 35 to 45 cm in enrollment mode. Now, capturing highest quality iris biometrics images is fast, simple and fully intuitive for all

subjects, including non-acclimated ones. For small scale access control or time & attendance applications, the capture range can optionally be extended to 30 to 45 cm in recognition mode, further increasing positioning flexibility and ease of use.

The EF-45 now incorporates a proprietary “deep learning” based face detector algorithm, developed by CMITech, that makes the system faster, smoother and even more intuitive than before. This algorithm also enhances operation in bright ambient light for deployment positioning flexibility.

The system captures high quality face images simultaneously with iris image capture. On board face recognition is standard. The EF-45 is an embedded system that includes its own ARM mainboard to manage all face and iris imaging processes.

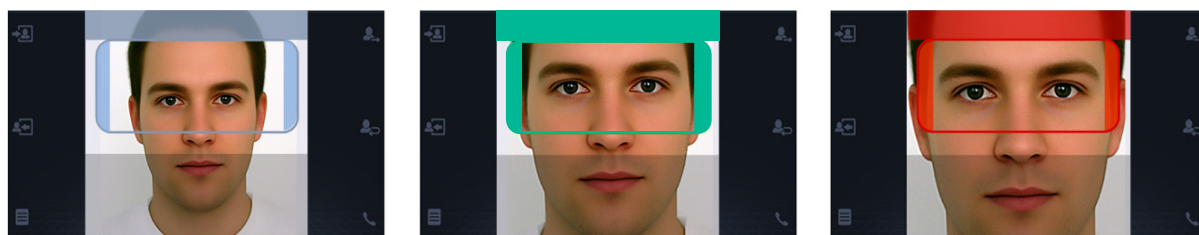
The normal external communication to host systems and clients is through TCP/IP via an Ethernet connection, but USB connectivity to a local PC host is available.

The embedded architecture allows for on-board iris and face template generation and matching against a local data base.

The EF-45 is offered in two basic hardware configurations: the EF-45AC version is for physical access control (PACS), time & attendance and similar applications, and includes an embedded MiFare card reader plus a wall mount bracket and a full set of I/O connectors; the EF-45ID version is for general identity management applications and does not include the card reader.

Innovative, Intuitive Subject Positioning

The EF-45's face imaging sensor detects and displays the subject's face over 1.0 meter from the system on the high resolution color display. The subject will naturally move toward the iris capture range of up to 45 cm by simply making his or her face fit the positioning "guide box". Vocalized instructions also command the user to move forward or back to get into range. When in the proper range, the guide box and top border turn green, indicating to the subject to stop and wait until the image capture process is completed. Like a smart phone "selfie" image, this interface is highly intuitive, with typical capture times of 0.5 seconds from proper positioning.



Includes color visual cues for proper distance



MOVE FORWARD
Blue for too far away.



GOOD
Green for OK!



MOVE BACKWARD
Red for too close.

Key Features

Feature

State-of-the-art optical design

Advanced, proprietary stereoscopic eye localization

Highest image quality

Compact, lightweight design

Simplest of user instructions

Stand-off distance of 35 to 45 cm in enrollment mode

Optional Extended Depth of Capture for iris authentication in recognition mode

Real time image quality metrics

User Advantages

The optical design includes utilizing highest quality optics and very fast shutter speeds, which allows the systems to exceed industry standards for image quality.

The EF-45 accurately locates in real time the position of both eyes in 3D to optimize subject ease of positioning and iris image quality. This feature enables the fast and reliable subject distance positioning indicators shown as blue, green or red color codes.

Meets or exceed the ISO 19794-6 2011 and ISO 29794-6 iris imaging specifications.

Optimizes placement or mounting options, including wall, swing-arm, or eGate mounting solutions.

Very simple and repeatable subject instructions:

- Position face within guide box in display (like smart phone “selfie”)
- Move toward the system to size head to box
- Once within range, the box and indicator bar will turn green to indicate proper positioning

Capture is automatic once subject is in proper position and real time image quality metrics parameters are met.

Standard extended range ensures robust, fast and easy positioning. Comfortable range for subjects in wide variety of desktop, countertop, kiosk or wall mount placements.

Depth of capture can be extended to range of 30 to 45 cm in recognition mode (not necessarily ISO compatible). Intended for small to medium scale access control deployments. Selectable in SDK.

Image quality metrics included in capture algorithm:

- Subject gaze angle (i.e. whether the subject is looking directly ahead at the imager)
- Subject motion
- Focus
- Usable iris area (occlusion)

Key Features

Feature

Face image capture

User Advantages

Face images are collected in synchronization with the biometric iris images, so that the data record consists of one face image and two iris image.

Note: the face images do not qualify as ISO standard, and therefore are not intended for large scale face recognition purposes. They are intended for small scale face recognition and manual verification of the subject's identity.

Very wide interpupillary distance

The wide interpupillary distance range accommodates all adults and young children, making it ideal for large scale, public authentication programs.

Large on-board data bases for on-board identification and authentication

Standard on-board (local) iris data base of 10,000 subjects (iris template-pairs), with matching speed of about 1.0 second in 1:N mode.

Optional hardware configuration offers an expanded data base size of 50,000 subjects, with matching speed of about 1.0 second in 1:N mode.

Face template data base size of 1,000 subjects.

Cable connectors

Plug in connector kit for all cabling (except RJ-45 Ethernet) included in accessories package.

WiFi option

Field installable WiFi dongle for ease of networking installation. (Contact CMITech for WiFi dongle specification for each country).

Card reader option

Standard in EF-45 AC version only, this is an embedded MiFare card reader for support of dual or multi-factor authentication, or backup authentication for special case users.

Local language support

Screen commands for both subject and integrator are available in multiple languages. Please contact CMITech for list of languages that are supported.

Positioning vocalizations can be modified into local languages by systems integrators through modification of on-board .wav files.

Technical Specifications

Embedded CPU	ARM Cortex A9 quad-core processor
On-board Iris algorithm for encoding and matching	Standard in all configurations
Flexible Software Development Kit (SDK) configurations	High Level SDK's offered in C# (.NET) and C++ versions. Includes host side application to connect to EF-45 resident services layer so that integrator does not need to program EF-45 device.
Configuration Utility software application	This host side software application provides centralized (network) control and setup of system configuration, Wiegand settings, and IP address settings, as well as providing for centralized FW upgrades.
Dimensions	166 x 166 x 43 mm (6.5 x 6.5 x 1.7 inches) without mounting wall plate
Weight	630 g without wall plate
On-board data storage	Standard: 10,000 iris template pairs (useful for 1:N authentication mode) with match speed of about 1.0 second Optional: 50,000 iris template pairs with match speed in 1:N mode of about 1.0 second Face data base size of 1,000 face templates, with 1:N match speed of about 1.0 second
Dual factor authentication with iris recognition	Smart card and PIN options for more secure authentication
Iris image output	Meets ISO 19794-6 2011 and ISO 29794-6 iris imaging standards
Iris image pixel resolution	640 x 480 pixels, 8 bit depth, supports multiple formats
Adjustable FAR (false accept rate)	Iris algorithm threshold can be modified to adjust FAR to between 10^{-8} and 10^{-14}
Standard operational iris imaging distance (stand-off range) and depth of field	35 to 45 cm range (10 cm depth of capture range) in enrollment mode, meets ISO 19794-6 specifications
Optional Fast Recognition mode with extended capture range	Fast recognition mode provides 30 to 45cm range (15 cm depth of capture) for small scale applications. Does not necessarily meet ISO specifications. Selectable in SDK.
Iris positioning indicators	Face positioning within box in LCD serves to center users face in X-Y dimensions. Subject sizes face to box size within LCD display for distance (Z) positioning, with simultaneous color bar display for correct distance positioning: Blue: too far away Green: OK Red: too close Supplemental voice distance feedback also simultaneous. Convertible to local language via .wav file substitution.
Auto tilt	Internal auto tilt range of +25 to -20 degrees, which corresponds to height range of approximately 40 cm. System can be mounted at any height to accommodate local user population. Please contact CMITech for mounting recommendations.

Iris time of capture	Typically about 0.5 second from time the subject's eyes are properly placed within capture volume.
IR illumination for iris imaging	Dual wavelength LEDs (spectral range of 700 to 900 nm) that conforms to ISO best practices for iris imaging.
Face image capture	Standard 24-bit color and NIR, both accessible from SDK
Face recognition imaging	Standard on-board encoding and matching
Audio	24 bit, 1 W embedded speaker Line out connector for external speaker
Operating temperature range	0 to 45° C
Humidity	10 to 90% RH, non-condensing
Illuminator eye safety standard	IEC 62471
Network interface , standard	10/100 Base-T Ethernet (RJ45 connector)
WiFi network interface, optional	Please contact CMITech for WiFi support in each country.
Card reader option	Integrated, basic CMITech MiFare / DesFire reader (in EF-45 AC version only)
Standard mounting	¼ - 20 UNC (consumer camera tripod mount type)
Kensington lock slot	Standard
Physical access control (EF-45AC) version accessories	Terminal and wired connectors for: Wiegand in/out, RS-232, RS-485, 2X TTL (GPIO) inputs, 1 dry contact relay Detachable wall mount plate for easy wall installation.
ID management (EF-45ID) version accessories	Terminal and wired connectors for: RS-232, RS-485, 2X TTL (GPI), 1 dry contact relay
Power supply requirement	Input 110 to 240V AC; Output 12~15V DC, 3.0A Adapter provided standard with system.

Contact

Please Contact CMITech or your representative for more information about the EF-45 product, CMIRIS Software Development Kits (SDK) and other supporting software.

CMITech Company, Ltd.
5th Floor, 38 Burim-ro, 170Beon-gil,
Dongan-gu, Anyang-si, Gyeonggi-do,
14055, Republic of Korea
Tel : +82.70.8633.8277
Fax: +82.31.624.4490

CMITech America, Inc.
2033 Gateway Place, Suite 500
San Jose, CA 95110 USA
Tel: (1) 408 573-6930

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