

EF-45NC™ Iris Recognition System

Innovative face-display positioning provides outstanding ease-of-use at a capture range of 33 to 45 cm



APPLICATION

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

Product Description

The EF-45NC next generation iris recognition 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.

New for the EF-45NC is an improved and faster ARM quad-core (4 core) CPU, providing more processing power for all system functions. The system retains the integrated time-of-flight (TOF) proximity and

distance sensor for fast and precise detection of all subjects as they approach the system. The EF-45NC also retains a faster tilt motor and CMITech's proprietary "deep learning" based face detector algorithm. Together, the system is faster and smoother than ever before. The deep-learning face detector also enhances operation in bright ambient light for deployment positioning flexibility. Now, capturing highest quality iris biometrics images is fast, simple and fully intuitive for all subjects, including non-acclimated ones.

The EF-45NC operates at an expansive capture range of 36 to 43 cm in enrollment mode. In recognition mode, the capture range is extended to 33 to 45 cm, further increasing positioning flexibility and ease of use.

The system captures high quality face images simultaneously with iris image capture. On-board face recognition is optional.

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

The EF-45NC is fully backward compatible with the prior generation EF-45 and EF-45N configurations, which means that no API changes are required for systems integrators. This allows for placement of the EF-45NC unit in mixed deployments with no impact on integration software.

Innovative, Intuitive Subject Positioning

The EF-45NC's TOF sensor detects subjects from over 1.0 meter from the system; the subject's face is immediately displayed on the 5.0-inch high-resolution color display. For proper positioning, the subject will naturally center his face 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 and authentication times of 0.5 seconds from proper positioning.

Color visual cues for proper distance positioning



MOVE FORWARD

Blue for too far away



GOOD

Green for OK!



MOVE BACKWARD

Red for too close

Key Features

Feature

User Advantages

State-of-the-art optical design

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

Advanced, proprietary stereoscopic eye localization

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

Highest image quality

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

Compact, lightweight design

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

Simplest of user instructions

Very simple and repeatable subject instructions:

- Position face within guide box in display (like smartphone “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.

Stand-off distance and depth of capture in enrollment mode

35 to 42 cm, ensuring robust, fast and easy positioning. Comfortable range for subjects in wide variety of desktop, countertop, kiosk or wall mount placements.

Extended depth of capture in recognition mode

Depth of capture can be extended to a range of 32 to 45 cm in recognition mode (not necessarily ISO compatible). Intended for small to medium scale access control deployments. Selectable in SDK.

Real time image quality metrics

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)

Feature

User Advantages

Face image capture

A face image is always collected at same time as capture of iris images, so that the data record consists of one face image and two iris images.

Note: the face images do not fully 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. Face images also remain in the log file to visually verify who was authenticated.

Face recognition

Optional. Contact CMITech for algorithm selection and pricing.

Very wide interpupillary distance range

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 onboard identification and authentication

Standard on-board (local) iris database of 100,000 subjects (iris template-pairs), with matching speed of under 1.0 second in 1:N mode for full database.

Face template data base size of 3,000 subjects.

Template-on-card (TOC)

Supported for MIFARE / DesFire cards.

Cable connectors

For AC version, plug-in connector kit for all cabling (except RJ-45 Ethernet) included in accessories package.

WiFi

Option by external USB WiFi dongle (contact CMITech sales support for details)

Card reader

Standard in AC version only: embedded MiFare / DesFire card reader for support of dual factor authentication, or backup authentication for special case users.

I/O interface

Standard connections include TCP/IP(Ethernet), dual Wiegand in / out, GPI, RS-485, RS-232, contact relay, tamper, factory reset, SIM socket (factory option)

Language support

Display languages of English, Korea, Traditional Chinese, Simplified Chinese, Japanese, Spanish, Italian, Arabic, and Russian.

Voice positioning commands

Vocalizations for positioning guidance can be modified by local systems integrators through modification of on-board .wav files, or by special request to CMITech support.

Technical Specifications

Embedded CPU	ARM quad-core
On-board Iris algorithm for encoding and matching	Standard in all configurations
Flexible Software Development Kit (SDK) configurations	High Level SDKs offered in C# (.NET), C++, C, and Java versions. Includes host side reference application to connect to EF-45NC resident services layer so that integrator does not need to program EF-45NC 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.
Compatibility with prior generation EF-45/EF-45N	Fully backward compatible to prior SDK versions for the EF-45/EF-45N, which means that no API changes are necessary when installing in legacy solutions.
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	Up to 100,000 iris template pairs with match speed about 1.0 second either in 1:N mode (identification) or 1:1 mode (verification). Up to 100,000 face templates in 1:N or 1:1 modes
Dual factor authentication	Iris with either smart card or PIN as second factor
Iris image pixel resolution	Meets ISO 19794-6 2011 and ISO 29794-6 iris imaging standards
Iris image output	640 x 480 pixels, 8bit depth, supports multiple formats
Adjustable FAR (false accept rate)	Adjustable iris algorithm threshold range of 10^{-5} to 10^{-14} FMR at 10^{-6} FNMR. Default is FMR of 10^{-8} .
Enrollment mode operational iris imaging distance (stand-off range) and depth of field	36 to 43 cm range (7 cm depth of capture range) in enrollment mode. Meets ISO 19794-6 2011 and 29794-6 specifications.
Recognition mode operational iris imaging distance	Recognition mode provides up to 33 to 45 cm range (12 cm depth of capture) for small scale applications. Does not necessarily meet ISO specifications. Range selectable in SDK.
Iris positioning indicators	Face positioning within box in LCD serves to center users face in X-Y dimensions. Subject will fit size of face to box size within LCD display for distance(Z) positioning, with simultaneous color bar display for correct distance positioning: <ul style="list-style-type: none"> • Blue: too far away • Green: OK • Red: too close Supplemental voice distance feedback is also simultaneous. Vocalizations 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. Contact CMITech for mounting recommendations.
Time of iris image capture and authentication	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 24bit color and NIR images, both accessible from SDK
Face recognition	Optional on-board encoding and matching
Audio	24bit, 1W embedded speaker
Operating temperature range	0 to 50° C
Humidity range	10 to 90% RH, non-condensing
Illuminator eye safety standard	IEC 62471
Network interface, standard	10/100 Base-T Ethernet (RJ45 connector) USB OTG support
RFID Card reader	Integrated CMITech MiFare Classic and DesFire reader (in EF-45 AC version only)
SIM card socket	Factory option
Mounting	¼ - 20 UNC (consumer camera tripod mount type) standard
Kensington lock slot	Standard
Physical access control (EF-45AC) version accessories	Detachable wall mount plate for easy wall installation. Terminal and wired connectors for: Wiegand in/out, RS-232, RS-485, 2X TTL (GPIO) inputs, 1 dry contact relay
ID management (EF-45NC ID) version accessories	Rear cover
Power supply requirement	Input 110V to 240V AC Output 15V DC, 3.0A AC power adapter included in all versions.
Power consumption	Maximum 36 W

Contact Information

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

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