

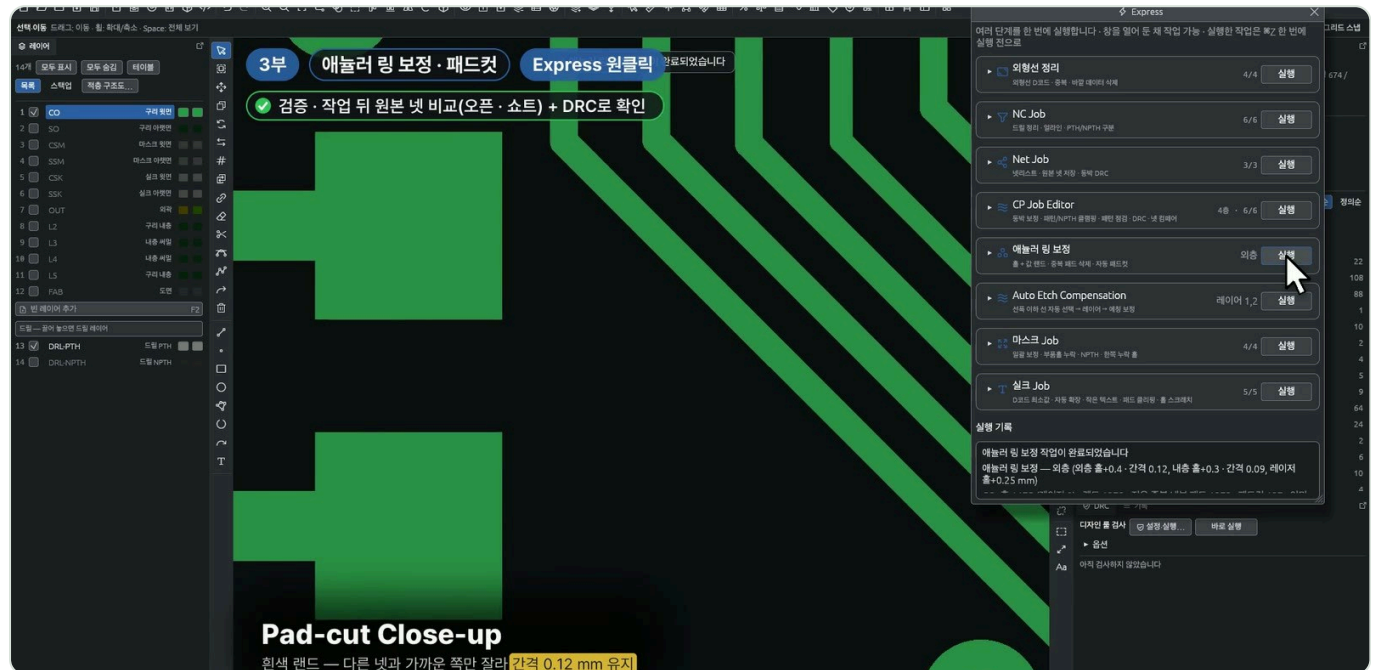
eCAM · PCB CAM Software

PCB CAM data prep in one tool

Drop in a zip archive and layer order, names and stack-up are set automatically. Silkscreen, annular ring and etch compensation run in a single pass, cutting repetitive work and manual errors.

Windows

macOS · Apple Silicon native



eCAM workspace — right after running annular ring compensation and pad cut in Express (sample data)

<p>RS-274X in/out · 274D in</p> <p>274D is recognized automatically once an aperture list is linked</p>	<p>ODB++</p> <p>Import and export (tgz) — import covers features, stack-up, drill and profile</p>	<p>One click</p> <p>Run multiple compensations in one batch from Agent Assist ▶ Express</p>	<p>Offline</p> <p>Fab drawing text recognition also runs on the PC, with no upload (macOS only · Windows in preparation)</p>
---	---	---	--

Workflow

From data intake to output, in one window

- | | | | | |
|--|--|---|---|--|
| <p>01</p> <p>Import</p> <p>Drag and drop a zip — formats, drill pairing and layer names detected automatically</p> | <p>02</p> <p>Spec review</p> <p>Read and translate fab notes; apply the drawing's stack-up table to the stack-up diagram</p> | <p>03</p> <p>Compensate</p> <p>Silkscreen, annular ring, pad cut, etch compensation</p> | <p>04</p> <p>Verify</p> <p>Netlist comparison against the original (opens/shorts) and DRC</p> | <p>05</p> <p>Array & output</p> <p>Build the array and auto-insertion guide rails; output Gerber, Excellon and ODB++</p> |
|--|--|---|---|--|

Modules

eCAM · eCAM+ · eCAM Agent

Choose eCAM for core CAM work, or eCAM+ if you need dynamic etch compensation and AEC.

<div>Standard</div> <div>eCAM</div> <div>The full CAM data preparation process</div> <div><ul style="list-style-type: none">Gerber (RS-274X in/out · RS-274D in), Excellon, ODB++, automatic zip importFab Note Analyzer — drawing text recognition (macOS only · Windows in preparation), translation, stack-up cross-checkSilkscreen text scaling, silkscreen outline expansion, silkscreen clipping at padsAnnular ring compensation, pad cutNetlist comparison, DRC, clearance correctionArray, auto-insertion guide rails, panelizationExpress Job batch processing</div>	<div>Dynamic etch compensation · AEC</div> <div>eCAM+</div> <div>All of eCAM + dynamic etch compensation and AEC</div> <div><ul style="list-style-type: none">All standard eCAM featuresDynamic etch compensation — compensates line width while keeping spacing to neighbors (selected lines only, if needed)Express automatic etch compensation (AEC) card</div>	<div>Closed beta</div> <div>eCAM Agent</div> <div>Currently in closed beta</div> <div><ul style="list-style-type: none">Spec review and work-instruction assistance, being validated with selected customersBuilt on eCAM+ features</div>
---	---	---

Feature	eCAM	eCAM+	Agent
Gerber RS-274X in/out · RS-274D in · Excellon · ODB++	●	●	●
Automatic zip import · automatic layer naming and ordering	●	●	●
Fab Note Analyzer (text recognition, translation, stack-up cross-check — recognition is macOS only)	●	●	●
Silkscreen edits (scaling, expansion, clipping)	●	●	●
Annular ring compensation · pad cut	●	●	●
Netlist comparison · DRC	●	●	●
Array · auto-insertion guide rails · panelization	●	●	●
Express Job batch processing	●	●	●
Dynamic etch compensation · automatic etch compensation (AEC)	—	●	●
Spec review and work-instruction assistance (in closed beta)	—	—	Closed beta

Overseas plant · Vietnam

Overseas HQ engineers and Vietnam site staff, talking face to face at one monitor

Engineers from the overseas head office and local engineers at the Vietnam plant look at the same screen to hand over specs, review CAM data and give work instructions. What each person says appears right away as subtitles in the other's language — English ↔ Vietnamese, with Korean ↔ Vietnamese also supported — so the discussion can continue without calling in an interpreter. BridgeTalk is used in front of one shared monitor; it does not include remote meeting connections.

Xem thông số kỹ thuật và dữ liệu CAM trên cùng một màn hình, trao đổi trực tiếp với kỹ sư từ trụ sở chính ở nước ngoài qua phụ đề dịch Anh–Việt theo thời gian thực.

View technical specs and CAM data together on one screen and talk directly with engineers from the overseas head office through real-time English–Vietnamese subtitles.

BridgeTalk của eCAM hỗ trợ trao đổi trực tiếp trước cùng một màn hình bằng chế độ nghe: lời nói được dịch thành phụ đề bằng ngôn ngữ của người đối thoại, không phát giọng đọc và không kết nối hợp từ xa. Cặp ngôn ngữ mặc định là Hàn–Việt; người dùng có thể chọn hai trong bốn ngôn ngữ: Hàn, Anh, Nhật và Việt. Với bảng thuật ngữ PCB/FPCB tích hợp và khả năng tham chiếu các câu trước trong cùng cuộc hội thoại khi dịch, BridgeTalk hỗ trợ kỹ sư trao đổi thông số kỹ thuật, rà soát dữ liệu CAM và truyền đạt hướng dẫn công việc khi cùng xem một màn hình. Dịch vụ yêu cầu kết nối Internet và sử dụng theo hình thức thuê bao; vui lòng liên hệ để nhận báo giá.

Real-time English ↔ Vietnamese subtitles

When one person speaks, subtitles in the other language appear on screen. English ↔ Vietnamese and Korean ↔ Vietnamese are both supported; any two of English, Korean, Japanese and Vietnamese can be selected. Listening mode is designed for people sharing one monitor; there is no voice output.

Built-in PCB/FPCB glossary

Shop-floor terms such as annular ring and gold finger are rendered as proper CAM terminology, and earlier sentences in the same conversation are used as reference.

Conversation context

Follows the earlier conversation, so phrases like “that one” or “the spec from last time” are translated in context.

Subscription service

Monthly / annual subscription · quote on request

eCAM

eCAM+

eCAM Agent

Spec handover

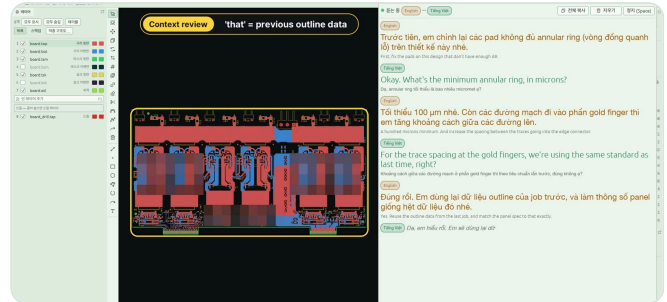
The HQ engineer explains customer specs and cautions directly on the data on screen

CAM data review

Local engineers ask questions in Vietnamese and check the same layer and location together

Work instructions

Compensation values and job sequence stay in the subtitles; copy all to keep a record

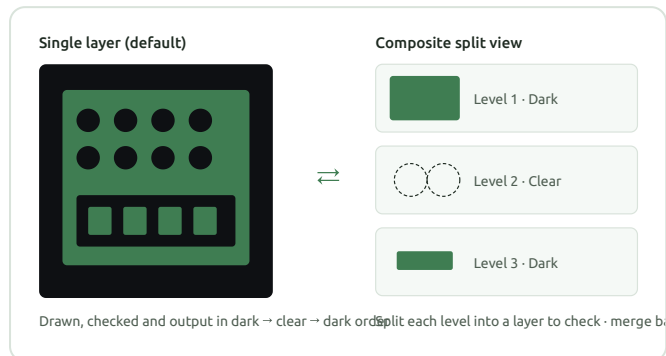


Staged image Explaining at one monitor while following BridgeTalk subtitles

Layer Handling

As one layer, or split by polarity level

Layers that mix dark and clear polarity can be handled two ways in the same program. Work on them as a single layer, and split them by level only when you need to check.



Negative apertures · polarity levels (LPD/LPC) preserved

Dark and clear polarity levels in the Gerber are read in order and displayed exactly as plotted, and keep their polarity order on Gerber export. Apertures can be set to negative (clear), and selected data can be converted to a negative aperture of the same shape.

Edit > Selection → To Negative Aperture · Aperture Edit > Negative

Work as one layer, split when needed

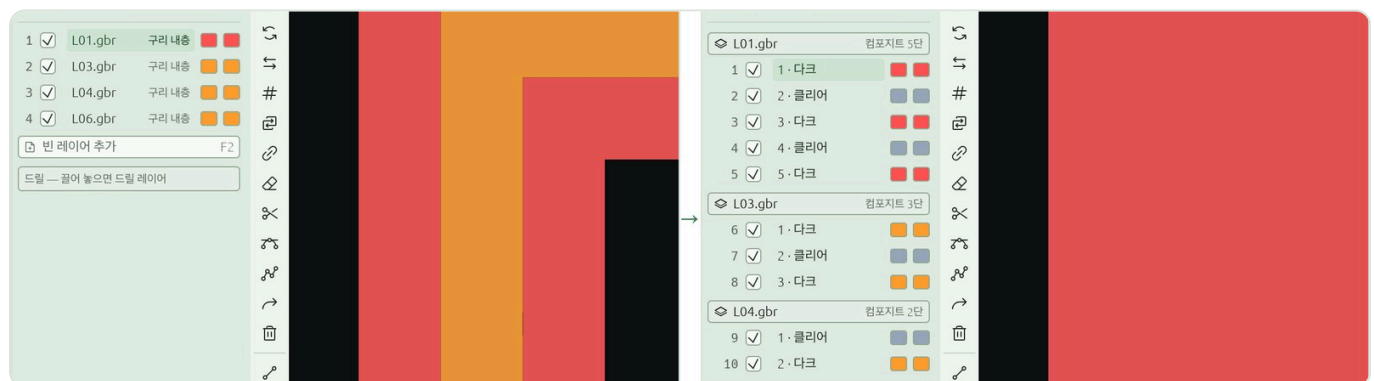
A mixed-polarity layer is treated as one layer for editing and checking. Turn on composite split view to see each level as its own layer, then merge them again from the layer list.

View > Composite Split View · Layer List > Split / Merge Composite

Composite build · compress

Layers with paired names (X + X-NE) are combined into one target layer, and the number of dark/clear levels is reduced without changing the image.

Tables > Composite... · Compress Composite

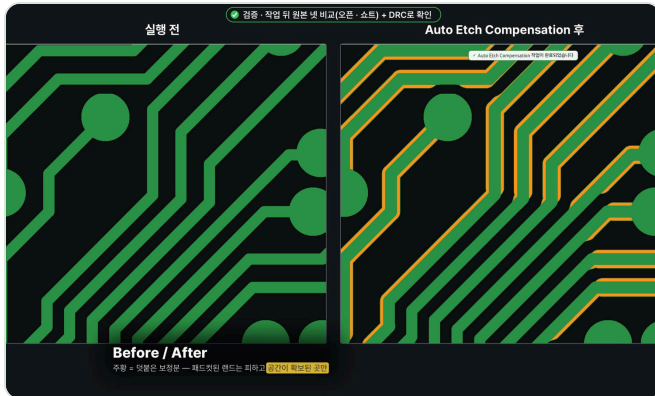


Single-layer view → composite split — layer bar with a synthetic 4-layer sample containing mixed dark/clear levels

Key Features

Key features and results

All screens were captured with sample data. Click an image to enlarge it.

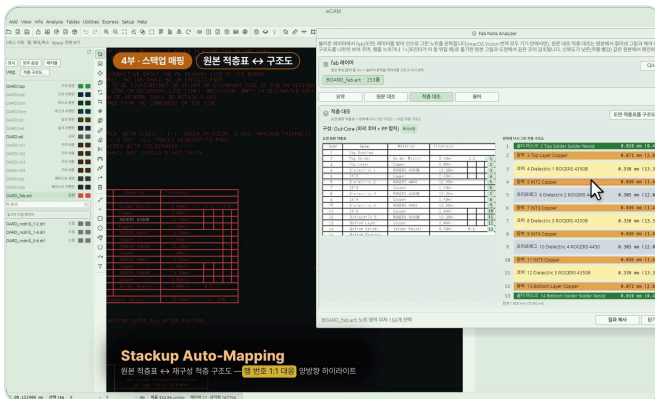


Dynamic etch compensation

Compensates traces at or below a specified width, and skips segments where minimum spacing to adjacent traces would not be met.

eCAM+

Express AEC

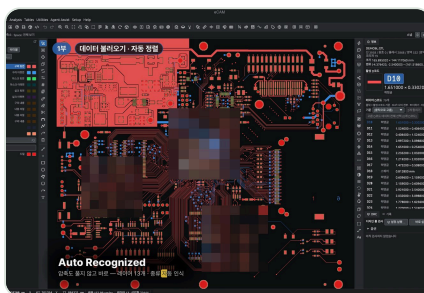


Fab Note Analyzer

Reads stroked text on the drawing layer, then organizes and translates the specs and matches the drawing's stack-up table against the stack-up diagram and data layers. Reading is macOS only (Windows in preparation). Translation is English → Korean and requires the on-device language pack (without it, coverage is limited to the standard-phrase dictionary).

eCAM

Offline recognition · macOS only

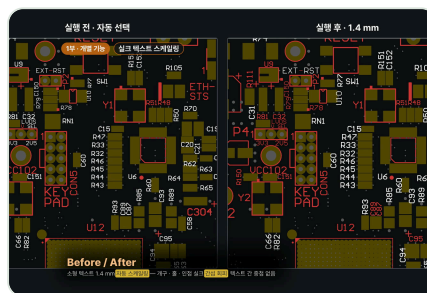


ZIP import · automatic layer ordering

Opens the zip as is, with no need to extract it. Detects Gerber and drill formats and aligns the drill data to the Gerber.

eCAM

RS-274D import · with aperture list linked

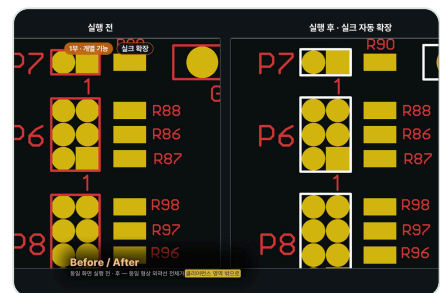


Silkscreen text scaling

Finds stroked silkscreen text character by character and resizes it to a specified height in one batch while avoiding clearance violations.

eCAM

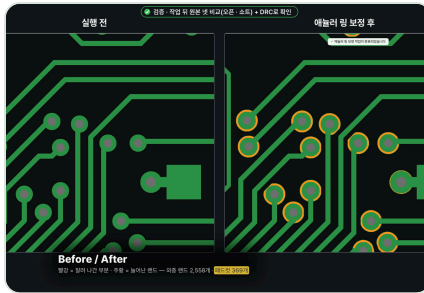
Batch



Automatic silkscreen outline expansion

Expands, moves or shrinks identical component outlines in one step to secure clearance to pads.

eCAM

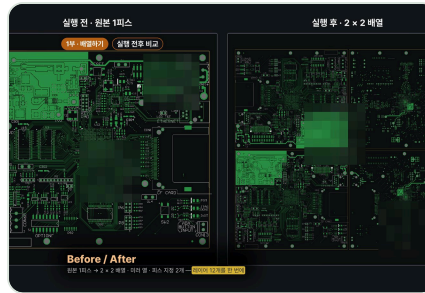


Annular ring compensation · pad cut

Enlarges pads around the holes and applies a pad cut where clearance to adjacent features is insufficient. Results are then checked by comparing the netlist against the original and running DRC.

eCAM

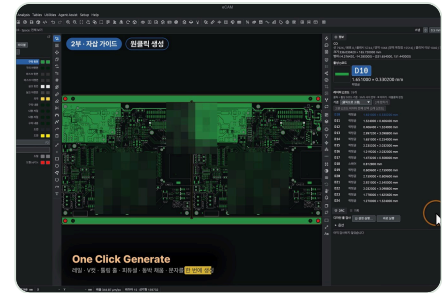
Express



Live array preview

Change rows, columns, direction, rotation and mirroring and see the result immediately. Rotate or mirror individual pieces with a click.

eCAM



One-click auto-insertion guide rails

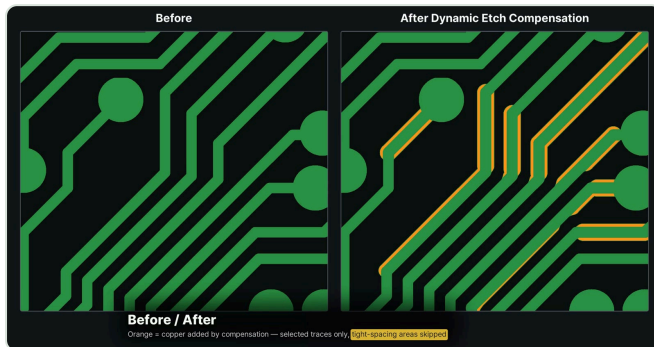
Set rails, V-cuts, holes and text with a live preview, then generate them in one step. Router paths and rail copper clearing are generated automatically.

eCAM

Demo Videos

Demo videos by task

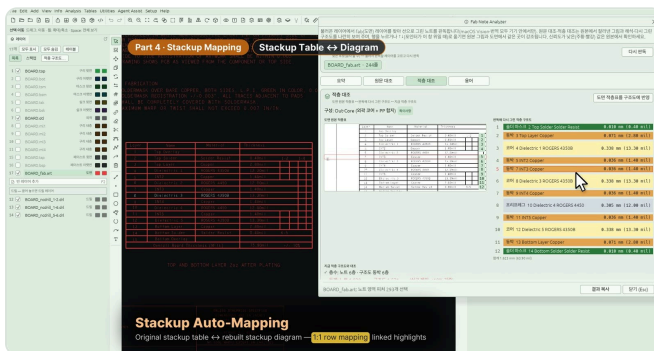
1080p · with audio. Press play to start.



Dynamic etch compensation — compensation amount calculated from line width and spacing

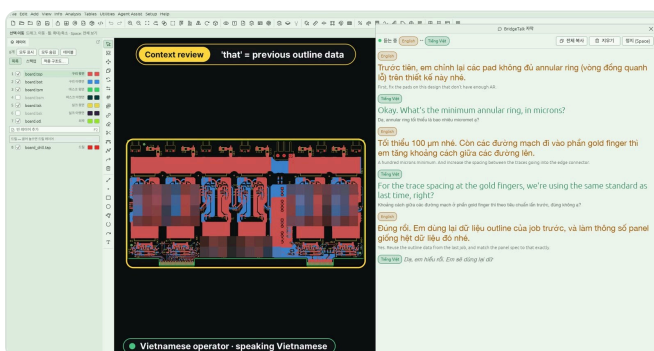
eCAM+

Starts at part 4 (trace compensation) of the etch compensation and pad cut demo (3 min 5 s) — use the seek bar to watch the earlier parts



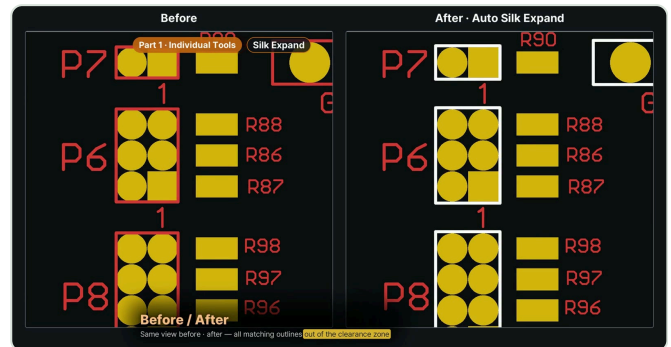
Fab Note Analyzer

Automatic layer detection · text recognition · spec translation · stack-up mapping — 2 min 17 s



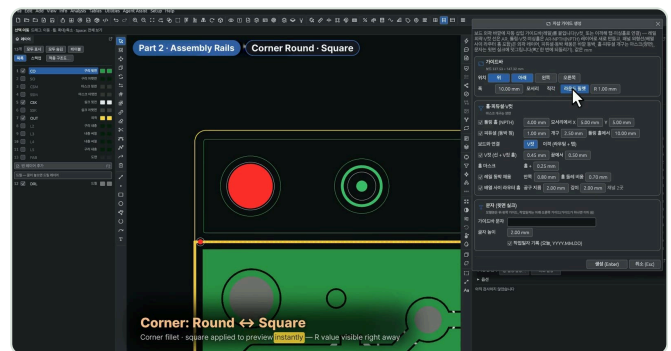
BridgeTalk · Agent Assist

Real-time English ↔ Vietnamese subtitles (any two of English, Korean, Japanese, Vietnamese) · built-in PCB/FPCB glossary · context-aware translation — 1 min 45 s



Silkscreen edits · eCAM Express

Silkscreen text scaling · outline expansion · Silk Job batch processing — 3 min 19 s



Array · auto-insertion guide rails

Live preview · stack-up mirroring · one-click guide generation — 2 min 45 s

System Requirements

Minimum · recommended (target) specs

Supported OS Windows · macOS (Apple Silicon native)

Item	Minimum		Recommended (target)	
Operating system	macOS	11 (Big Sur) or later	macOS	Apple Silicon Mac (native)
	Windows	64-bit	Windows	64-bit, latest version
Memory	macOS	24 GB	macOS	48 GB
	Windows	32 GB	Windows	64 GB
CPU	—		macOS	Apple Silicon M series
			Windows	current-generation 8-core class
GPU	—		macOS	Apple Silicon integrated GPU
			Windows	DirectX 12 or Vulkan support
Storage	—		SSD with free space for job data	
Display	1440 × 900 (default window size)		Larger display	
Network	Not required (works offline)		Internet connection and microphone for BridgeTalk	

Fab drawing text recognition in Fab Note Analyzer is macOS only (Windows in preparation). It runs locally using the built-in macOS Vision framework and requires Xcode Command Line Tools on first run.

BridgeTalk is a subscription service that requires an internet connection (contact us for pricing and what is included). Recommended (target) specs and screens may change as the product is improved.

Business Inquiries

Demos, quotes and distributor inquiries

We will run a live demo on your own data. Contact us for license options and quotes.

We are looking for distributors to partner with us on eCAM sales and technical support.

Website ecam.toffnlab.com
(<https://ecam.toffnlab.com>)

Email toffnlab@gmail.com