SOLUTION SUMMARY

UNISECURE™ SOLUTION MODULE EFP-001

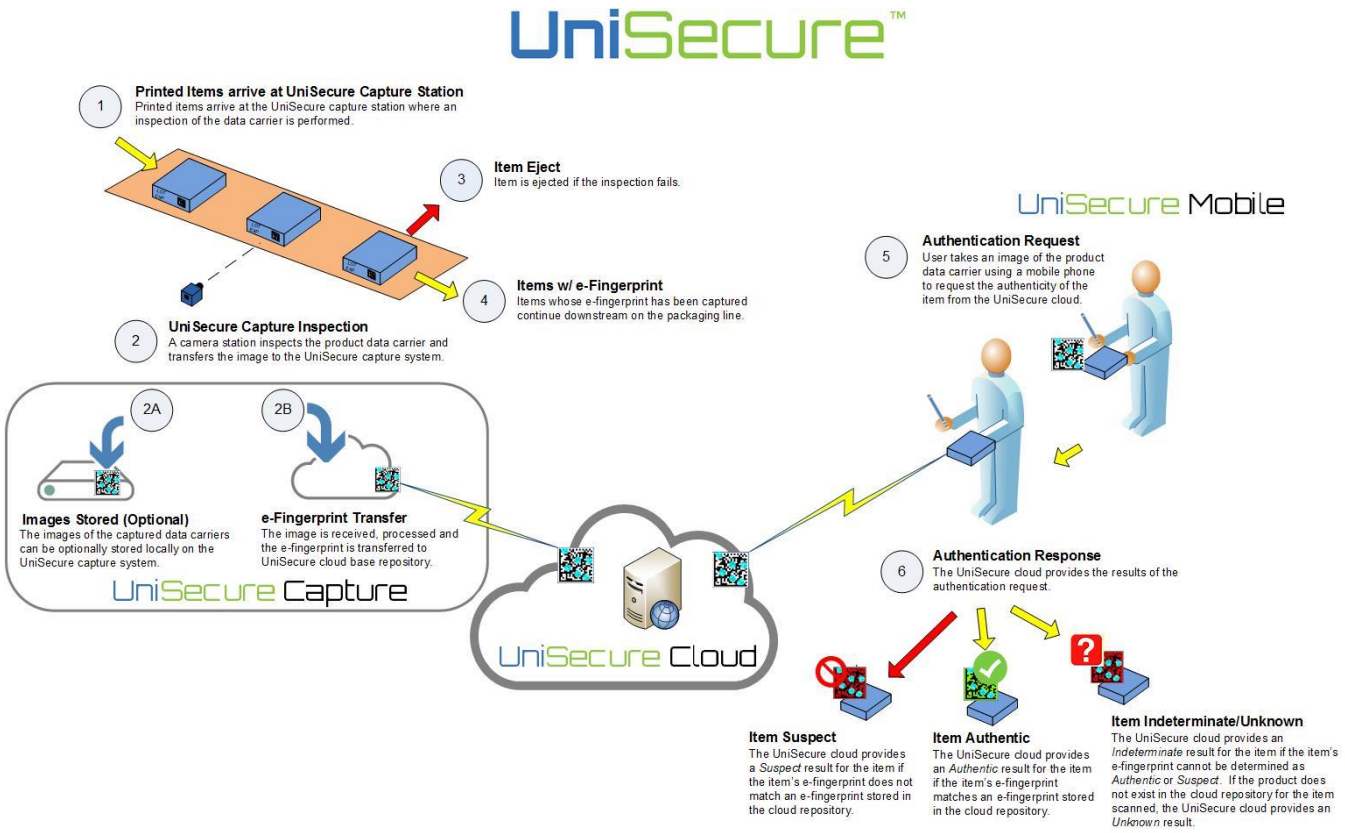
SINGLE ACQUISITION SYSTEM

eFP-001

Systech UniSecure™ is a product authentication technology for print marks to determine whether a product is genuine or counterfeit. The UniSecure™ Solution Module *eFP-001* provides a single acquisition system to capture, analyze and catalog the embedded minute variations native to each printing technology during the marking of the mark or data carrier on the product during the packaging process. These microscopic variations are then stored as the "genuine" e-fingerprint for the mark in the UniSecure cloud base repository and used later for authentication through the UniSecure mobile device application.

To begin the process, online printed items enter the inspection area where an image of the genuine mark is taken and then transferred to the UniSecure capture system. The UniSecure capture system receives, analyses, and processes the image. The e-fingerprint is extracted and uploaded to the UniSecure cloud data repository. The UniSecure capture system provides the option of storing processed genuine images locally. The UniSecure capture system is configured to provide digital I/O results to the machine.

Once the e-fingerprint data is uploaded to the data repository, product authentication is available immediately through the UniSecure authentication application installed on a supported mobile device. After the user takes an image of the mark or data carrier of the desired product with the mobile device, the application provides an "Authentic" or "Suspect" (counterfeit) response. The application returns an "Indeterminate" response if the item cannot not be defined as "Authentic" or "Suspect" and provides the user with recommendations on how to take another picture. If a product is not defined in the UniSecure clould repository for the item being scanned, the application provides an "Unknown" response and no authentication takes place.



ITEM DATA CARRIER MARKING CRITERIA:

The UniSecure Solution Module eFP-001 supports the following marking specifications:

Printer Types

- Ink Jet (Continuous)
- Laser Ablation
- Flexographic
- Digital
- Ink Jet (Thermal)
- Thermal Transfer
- Lithographic

Data Carrier Types

- Serialized Data Matrix
- Serialized QR Code
- Non-Serialized UPC-A, EAN-13, Code 39
- Non-Serialized Data Matrix
- Non-Serialized QR Code

Ink, Surface, and Line Speed Criteria

- *Ink* – High contrast dark on light background (black on white, dark blue on white, etc.)
- *Print Background* – Homogenous white background behind barcode
- *Substrate* – Matte (paper, card board)
- *Surface* – Flat (smooth, non-textured, devoid of wrinkles and non-deformable)
- *Line Speed* – Maximum of 600 ppm
- *Quiet Zone* – Follow GS1 specifications. Additional 2 mm required on top & bottom of linear barcodes.

UNISECURE CAPTURE INSPECTION OUTLINE:

See the VIM-eFP-100-V1 Interface Specification for details.

- **Field of View** – Maximum FOV for V1 option is 33mm x 18mm as seen in Figure 1. See Table 1 for details on other vision options.
- **Element Size** – Minimum element size is 0.50mm x 0.50mm for V1 option. See Table 1 for the minimum data matrix physical and module size for each vision option.
- **Barcode Size** – Minimum barcode size is 25mm wide x 12mm tall. Minimum thin-bar width is 0.17mm. Maximum barcode size supported by the UniSecure mobile application is 32mm wide x 25mm tall (this barcode size will require a larger FOV than defined in the VIM).

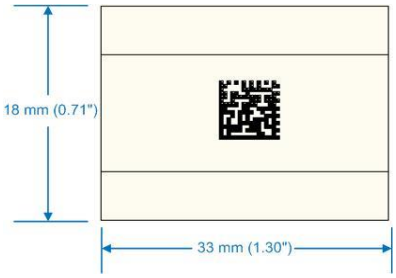


Figure 1: Max FOV for V1 Option

Module Size	Symbol Size		Capacity		V1(0.50²)	V2(0.50²)
	Row	Col.	Num.	Alpha-numeric	Physical Size	Physical Size
	16	16	24	16	8.0mm	8.0mm
	18	18	36	25	9.0mm	9.0mm
	20	20	44	31	10.0mm	10.0mm
	22	22	60	43	11.0mm	11.0mm
	24	24	72	52	12.0mm	12.0mm
	Maximum Field of View		Standoff			Linear Speed
V1 (25 mm lens and line light)	33mm x 18mm		121mm			0 – 1,000mm/s
V2 (35 mm lens and line light)	43mm x 23mm		197mm			0 – 1,000mm/s
V3 (25 mm lens and ring light)	33mm x 18mm		121mm			0 – 100mm/s
V4 (35 mm lens and ring light)	43mm x 23mm		197mm			0 – 100mm/s

TABLE 1: DATA MATRIX MODULE, PHYSICAL SIZE AND MAXIMUM FOV MATRIX

LINEAR SPEED CALCULATION

Linear speed is calculated using the parts per minute (PPM) and product pitch (spacing):

$$\text{Linear Speed in mm} = \frac{X \text{ parts}}{\text{min}} \times \frac{\text{min}}{60 \text{ sec}} \times \frac{Y \text{ mm}}{\text{part}}$$

where X = parts per minute and Y = product pitch (spacing) in mm

For example, a packaging line running 200 parts per minute at a 30 mm product pitch would yield a linear speed of 100 mm/s.

HARDWARE SELECTION CRITERIA

HSM2	-	USIGN	-	100	-	Vx

HSM2-USIGN-100-Vx is an all-inclusive hardware kit that provides all the components required to run a single camera UniSecure system. The kit also includes both 25mm and 35 mm lens to support the various options for mounting the camera (see table 1) depending on field of view or space requirements.

Trigger sensors, camera mounting brackets and lighting mounting brackets are **not** included in the hardware kit. The end user should provide these parts. The panel PC included in the hardware kit provides two (2) RJ45 Ethernet ports for Ethernet cable connections to the UniSecure cloud. USB to Wifi adapters can be provided by the end user if it is required.

HSM2-USIGN-100-Vx Bill of Materials (BOM)	
Quantity	Description
1	Advantech PPC-6120 with Stainless Steel Enclosure
1	iKey Keyboard Touchpad DU-5K-TP2-USB (English)
1	Stainless Steel Keyboard Tray
1	5 Port Network Switch
1	5 Port POE Switch
1	Systech eS-VIK Module
1	PPC-3100-VESAE Bracket
1	PPC-IPS-AE Advantech IPS Module
1	UniSecure B&W Camera
1	Kowa 25mm Lens
1	Kowa 35mm Lens
1	White Linear Front Light
1	Red LED Polarized Ring Light
1	Ai Male Pico Connector Kit
1	Lens Extension Kit
1	RJ45 10 Meter Camera Cable
1	Strobe Cable 10M A201110620-1
1	Camera Trigger & Power Cable

Panel PC:

Stainless Steel HMI/PPC enclosure [IP54]

Panel PC: Intel i5 Processor, 4:3 **12”** Touchscreen
Ethernet: Two (2) dedicated
RS232: Four (4)
USB: Four (4)
Power: 230VAC, 120VAC, or 24VDC 10Amps
Space for:

- One (1) eS-VIK
- One (1) 5 Port POE Switch
- One (1) 5 Port Network Switch

UPS:

Note: Figure shows UPS mounted to the back of the PPC.

- 50W (2.1A@24V) output, 25.2Wh with auto shut down function to PC
- With changeable battery pack for easy maintenance
- Supports over discharging protection to extend battery life
- With status indicators for monitoring battery pack and input power
- Software utility for configuration/monitoring

OPTIONAL – PEDESTAL MOUNTING KIT

HMI2	-	002	-	

→ "FLR" Floor Mount Pedestal
"CST" Pedestal with Casters

A pedestal mounting kit can be used as an add-on to the **HSM2-USIGN-100-Vx** kit if a UniSecure application requires a pedestal for the stainless steel enclosure.

Pedestal Mounting Options:

	
HMI2-002-FLR Floor Mount Pedestal for HSM2-001-x	**HMI2-002-CST** Pedestal with casters for HSM2-001-x

OPTIONAL - ADDITIONAL INSPECTION KIT

VIM	-	USIGN	-	Vx

VIM-USIGN-Vx can be used as an add-on to the **HSM2-USIGN-100-Vx** kit if a UniSecure application requires more than a single camera. **VIM-USIGN-Vx** contains the components required to add a camera station and includes both 25mm and 35mm lens to support the various options for mounting the camera (see table 1) depending on field of view or space requirements.

VIM-USIGN-Vx Additional Inspection/Capture Kit	
Quantity	Description
1	UniSecure B&W Camera
1	Kowa 25mm Lens
1	Kowa 35mm Lens
1	White Linear Front Light
1	Red LED Polarized Ring Light
1	Ai Male Pico Connector Kit
1	Lens Extension Kit
1	RJ45 10 Meter Camera Cable
1	Strobe Cable 10M A201110620-1
1	Camera Trigger & Power Cable