



EHEC

CIS SENSORS AND THERMAL PRINTHEADS

BANKING CIS

Solutions and datasheets

SENSORS FOR BANKNOTES AND DOCUMENTS

BANKING CIS

Optical imaging for banknotes and documents

Multispectral CIS technology and complementary sensors
for MIS magnetic imaging and DIS capacitive sensing.



TECHNOLOGIES

CIS

Visible, IR and UV

MIS

Magnetic image

DIS

Capacitive image

BANKING CIS • SCAN WIDTH

12–216 mm

RESOLUTION UP TO

600 dpi

INTERFACE

Analogue • LVDS

BANKING • RETAIL • CASH HANDLING

Technical product catalogue

Applications, specifications and imaging examples for CIS, MIS and DIS modules.

September 2026 edition



CATALOGUE GUIDE

Contents

Technologies, product-range specifications and imaging examples for banknotes and documents.

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The tables provide an overview of the range. Select a module by its full part number, revision and corresponding technical specification.

IMAGING TECHNOLOGIES

Three technologies, distinct functions

CIS, MIS and DIS capture different information from a banknote or document. The combination is selected to suit the application.



CIS Optical imaging

Imaging under visible, infrared and UV light, with reflective or transmissive illumination, depending on the configuration.



MIS Magnetic imaging

Reading magnetic patterns, security threads and inks on banknotes, cheques and tickets.



DIS Capacitive imaging

Detecting adhesive tape, overlaps, staples and special inks using electrostatic capacitance.

These acronyms denote distinct sensing principles, not three functions automatically included in a single module.

APPLICATIONS

Banking and retail applications

Imaging solutions for cash-handling and document-reading systems.



APPLICATION 01

Banking and cash handling

Banknote counters, sorters, ATMs, cash recyclers and banknote verifiers.



APPLICATION 02

Retail and self-service

Self-checkout systems, self-service kiosks, banknote validators and retail back-office systems.



APPLICATION 03

Cheques and documents

Cheque readers, card and passport scanners. Further office and form-reading applications are described on pages 7 and 8.

Select the active width, resolution, optical channels and interface according to the document to be read and the machine architecture.

CIS · PRODUCT SPECIFICATIONS

CIS for banking applications

Optical imaging for cheque readers, banknote counters, sorters and ATMs.



WIDTH

12–216 mm

MAX. RESOLUTION

600 dpi

MAX. CLOCK

32 MHz

CHANNELS

1–12 CH

Parameter	Specification
Scan width	12–216 mm
Resolution	100, 200, 300, 600 dpi
Clock options	8, 16, 24, 32 MHz
Reflective illumination	R, G, B; IR 940, 880, 850 nm; optional UV. Up to 6 colours per LED package.
Transmissive illumination	R, G, B; IR 940, 880, 850 nm; optional UV. Up to 6 colours per LED package.
Channels	1–12 CH
Focal position	0–0.9 mm
Glass thickness	0.7; 1.1; 1.8 mm
Interface	Analogue; LVDS digital
Customisation	Customisable configuration

The listed colours are configuration options. The actual combination and electrical parameters are defined in the module specification.

CIS · PRODUCT SPECIFICATIONS

CIS for retail



WIDTH

54–201 mm

MAX. RESOLUTION

600 dpi

CHANNELS

1–12 CH

Parameter	Specification
Scan width	54–201 mm
Resolution	100, 200, 300, 600 dpi
Clock options	8, 16, 24, 32 MHz
Reflective illumination	R, G, B, IR1, IR2, IR3, UV. Up to 7 optional colours.
Transmissive illumination	R, G, B, IR1, IR2, IR3, UV. Up to 7 optional colours.
IR wavelengths	940, 880, 850, 830, 810, 760 nm (options)
Channels	1–12 CH
Focal position	0–0.9 mm
Glass thickness	0.7; 1.1; 1.8 mm
Interface	Analogue; LVDS digital
Customisation	Customisable configuration

The number of optical channels and wavelengths are selected for the required configuration: not all options are necessarily available in the same module.



CIS · PRODUCT SPECIFICATIONS

CIS for back-office and office use

Card and passport scanners, mail sorting, multifunction devices, electronic whiteboards and scanners.



WIDTH

54–310 mm

MAX. RESOLUTION

600 dpi

MAX. CLOCK

32 MHz

CHANNELS

1–17 CH

Parameter	Specification
Scan width	54–310 mm
Resolution	300, 600 dpi
Clock	8, 16, 24, 32 MHz (optional)
Reflective illumination	R, G, B
Channels	1–17 CH
Focal position	0–3.5 mm
Glass thickness	0.7; 1.1; 1.8 mm
Interface	Analogue; LVDS digital
Other options	Customisation available

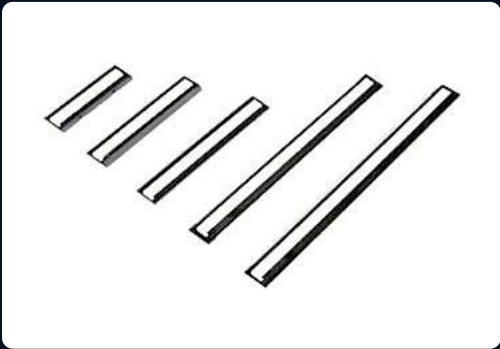
Applications beyond the banking range. Refer to the specification of the selected module.



CIS · PRODUCT SPECIFICATIONS

CIS for gaming and voting

Mark and form reading, lottery terminals and voting machines.



WIDTH

54–310 mm

MAX. RESOLUTION

600 dpi

MAX. CLOCK

32 MHz

CHANNELS

1–17 CH

Parameter	Specification
Scan width	54–310 mm
Resolution	50, 100, 200, 300, 600 dpi
Clock	8, 16, 24, 32 MHz (optional)
Reflective illumination	R, G, B
Channels	1–17 CH
Focal position	0–3.5 mm
Glass thickness	0.7; 1.1; 1.8 mm
Interface	Analogue; LVDS digital
Other options	Customisation available

Applications beyond the banking range. Refer to the specification of the selected module.

MIS · PRODUCT SPECIFICATIONS

MIS – Magnetic Image Sensor



Magnetic Image Sensor

TMR elements whose resistance varies with the magnetic field.
Reading magnetic patterns, security threads and inks.

Resolution (dpi)	20	50	50	100	100
Width (mm)	180	108	201	108	201
Analogue frequency (MHz)	2.5	2.5	2.5	2.5	2.5
Digital frequency (MHz)	16	30	30	30	30
Elements (pixels)	144	216	396	432	792
Serial digital output (bits)	8	8	8	8	8
Line time (µs/line)	87	116	188	202	346

Common parameters	Specification
Data output	1 analogue channel; 1 SPI channel
Power supply	3.3 V; 30 mA (110 mA maximum)
Customisation	Customisable configuration

MIS · TECHNOLOGY AND EXAMPLES

MIS – Magnetic imaging

The MIS produces an image of the magnetic content of a banknote or document.

PRINCIPLE

TMR

RESOLUTION

20, 50, 100 dpi

DIGITAL OUTPUT

8 bit

Parameter	MIS characteristics
Sensing technology	TMR
Detection sensitivity	20 mV/V/Oe
Resolutions	20, 50, 100 dpi
Widths	108, 180, 201 mm
Data output	Serial analogue; 8-bit digital

Imaging example

Sample banknote



Magnetic image



Illustrative image. Sensor response depends on the sample and the imaging configuration.

DIS · PRODUCT SPECIFICATIONS

DIS — Capacitive sensor



Depth Image Sensor

Detection of adhesive tape, overlaps, staples and special inks using electrostatic capacitance.

Parameter	Width 201 mm	Width 108 mm
Resolution	50 dpi	50 dpi
Analogue frequency	2.5 MHz	2.5 MHz
Digital frequency	30 MHz	30 MHz
Line time	188 μ s/line	116 μ s/line
Elements	396 pixels	216 pixels
Serial digital output	8 bit	8 bit
Data output	1 analogue channel; 1 SPI channel	1 analogue channel; 1 SPI channel
Power supply	3.3 V; 70 mA 5 V; 5 mA	3.3 V; 50 mA 5 V; 5 mA
Customisation	Customisable configuration	Customisable configuration

DIS · TECHNOLOGY AND EXAMPLES

DIS – Capacitive imaging

The DIS captures a continuous image using capacitive sensing to analyse the characteristics of the document.

PRINCIPLE

Capacitive

RESOLUTION

50 dpi

DIGITAL OUTPUT

8 bit

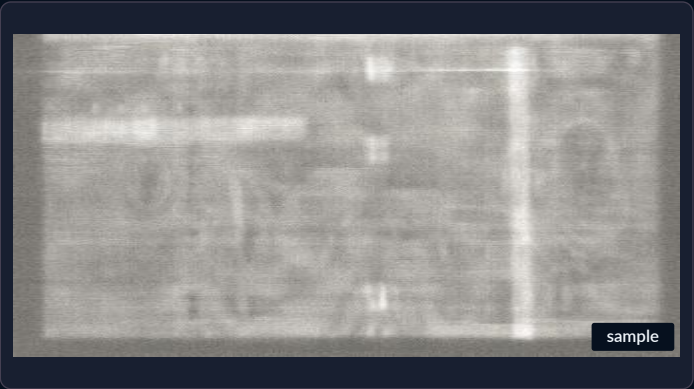
Parameter	DIS characteristics
Sensing principle	Electrostatic capacitance
Resolution	50 dpi
Elements	216 or 396 pixels, depending on width
Output image	Continuous image
Data output	Serial analogue; 8-bit digital

Imaging example

Sample banknote



Capacitive image



Illustrative image. Mechanical dimensions, power supplies and integration requirements depend on the selected model.

UV · MULTISPECTRAL TECHNOLOGY

UV and Color UV



All-in-One configuration

Reflection, transmission and UV in one module, with up to 6 colours per LED package.

Parameter	Specification
Active width	108, 183, 201, 216 mm (options)
Resolution	50, 100, 200, 300, 600 dpi (options)
Clock	8, 16, 24, 32 MHz
Reflective illumination	R, G, B; IR 940, 880, 850 nm; optional UV
Transmissive illumination	R, G, B; IR 940, 880, 850 nm; optional UV
Focal position	0.45 mm or 0.9 mm from the glass surface
Optical configuration	Reflection + transmission + UV; up to 6 colours per LED package
Customisation	Customisable configuration

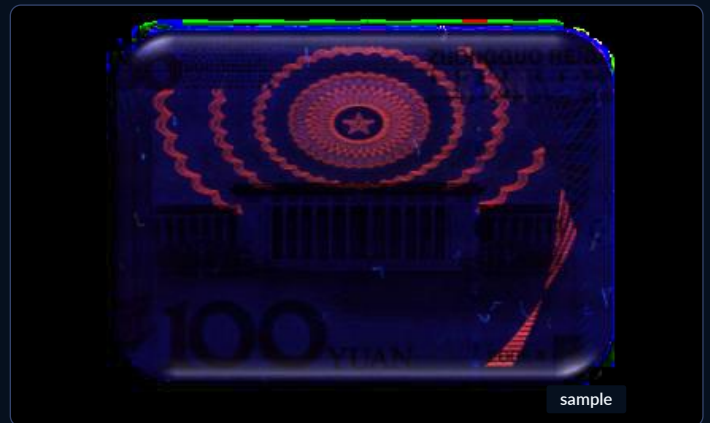
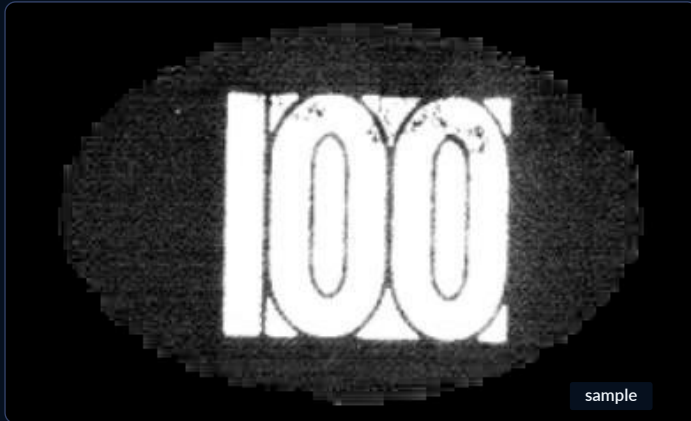
The combination of light sources and imaging channels is defined in the module specification.

UV · MULTISPECTRAL TECHNOLOGY

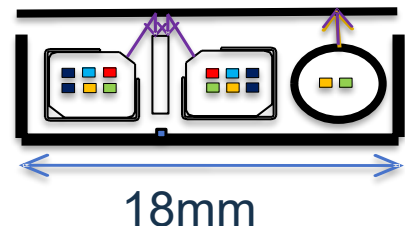
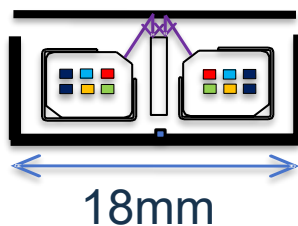
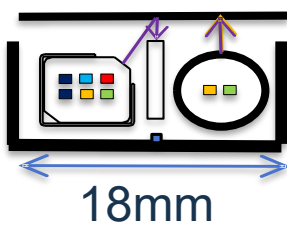
UV – Images and cross-sections

Monochrome UV and Color UV imaging examples of security features.

Sample images



Three 18 mm All-in-One cross-sections



CAPTURED IMAGES

EUR 50 — R, G, B and IR channels

Multispectral imaging examples. Optical options depend on the selected module.

Front

Back

R



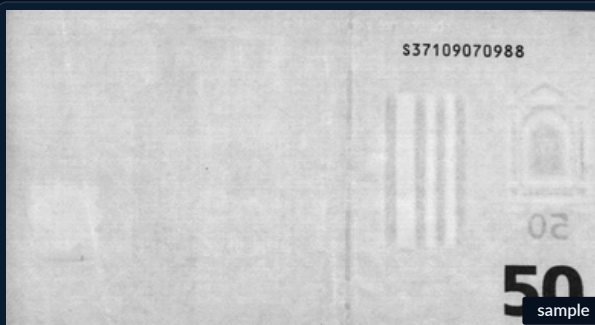
G



B



IR



CAPTURED IMAGES

EUR 50 — RGB, UV and Color UV

Imaging examples under visible light and 365 nm UV illumination.

Front

Back

UV
365 nm



RGB



Color UV
365 nm



CAPTURED IMAGES

Yen — RGB and IR images

Comparison of 10,000, 5,000 and 1,000 yen samples.

Sample A

Sample B

10,000
yen
RGB



10,000
yen
IR



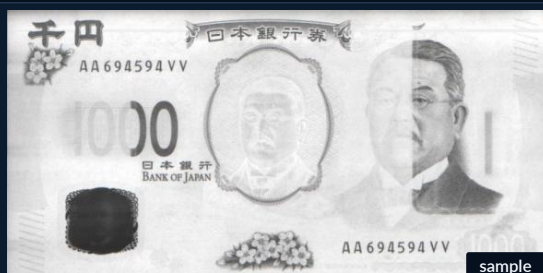
5,000
yen
RGB



1,000
yen
RGB



1,000
yen
IR



Imaging channels: RGB and IR for 10,000 and 1,000 yen; RGB for 5,000 yen.

CAPTURED IMAGES

Yen – Magnetic images

MIS imaging examples at 20 dpi on banknotes of different denominations.

Sample A

Sample B

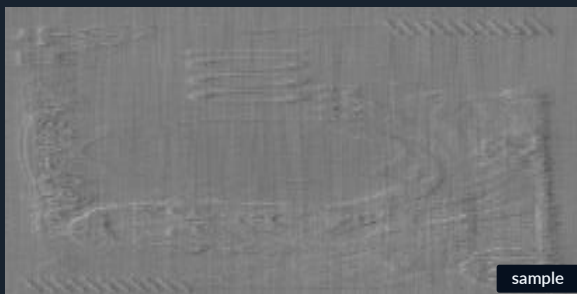
10,000
yen
20 dpi



5,000
yen
20 dpi



1,000
yen
20 dpi



CAPTURED IMAGES

Hologram imaging

Hologram details captured from sample banknotes.

10,000 yen — scan 1

DETAIL



10,000 yen — scan 2

DETAIL



10 GBP — scan 1

DETAIL



10 GBP — scan 2

DETAIL



CAPTURED IMAGES

Holograms — Canadian dollars and euros

Banknote view and hologram detail.

100 Canadian dollars



20 euros



CAPTURED IMAGES

Cheques — Monochrome and colour UV

Comparison of monochrome UV and Color UV images of a sample cheque.

Chinese cheque — Monochrome UV



Chinese cheque — Color UV



CAPTURED IMAGES

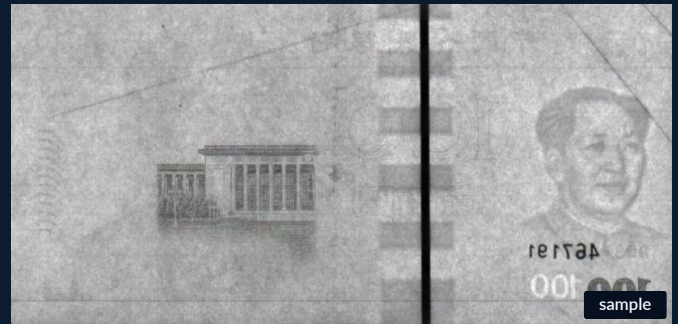
Complementary sensing examples

Optical, magnetic and capacitive images of sample banknotes and cheques.

100 RMB — RGB



100 RMB — IR transmission at 940 nm



Cheque — Monochrome UV



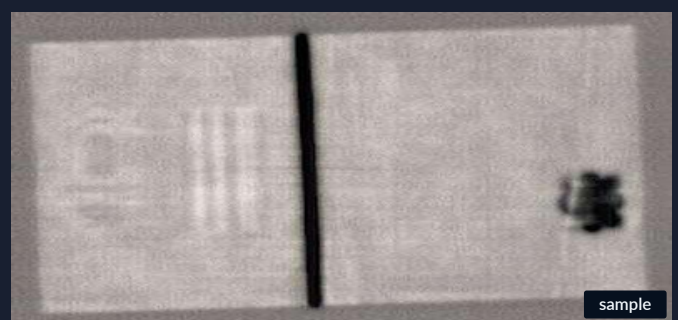
10,000 yen — MIS 100 dpi



Cheque — Color UV



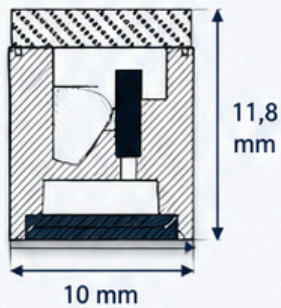
50 euros — DIS 50 dpi



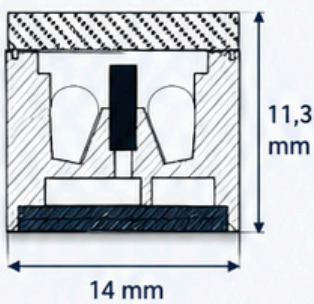
MECHANICAL INTEGRATION

Miniaturised structures

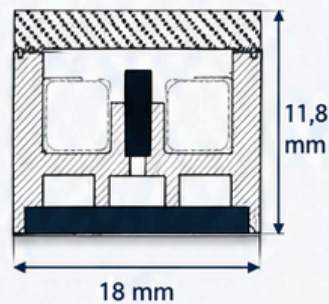
Single guide



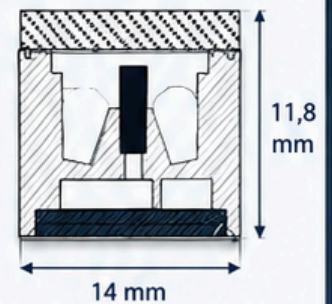
Dual guide



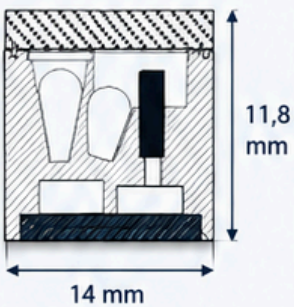
UV guide



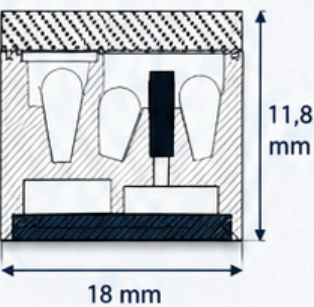
Standard single guide



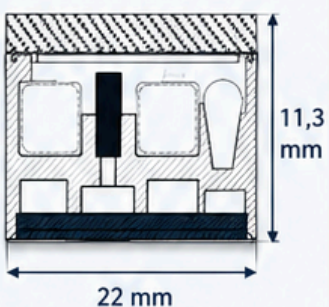
Single guide + transmission



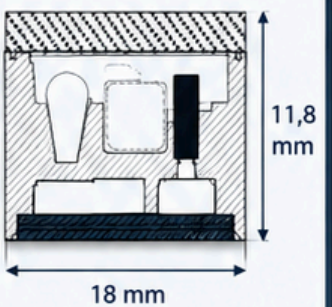
Dual guide + transmission



UV guide + transmission



Standard guide + transmission



Dimensions in mm. For integration, use the drawing for the selected model.

OPTICAL INTEGRATION

Illumination architectures

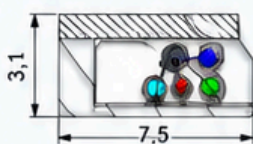
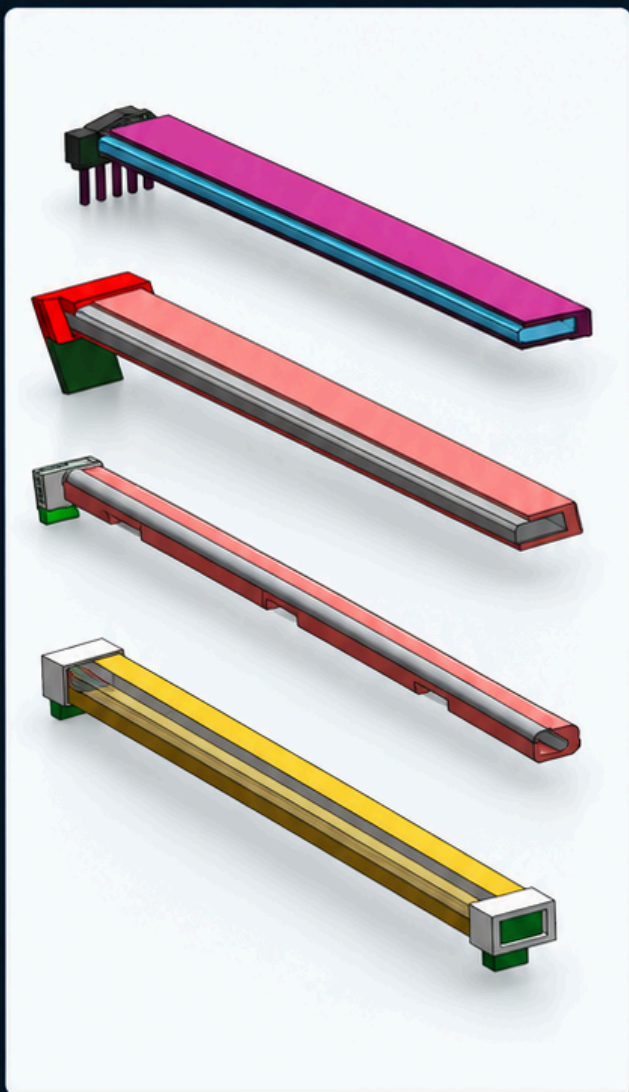
Reflection

Single or dual light guide, illuminated from one or both ends.

Transmission

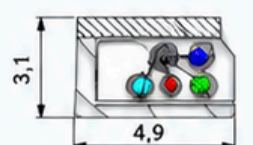
Light source on the opposite side of the document, illuminated from one or both ends.

Light guide views



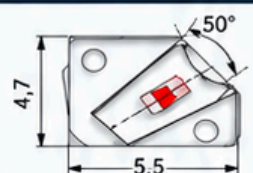
Standard structure

7.5 × 3.1 mm



Miniaturised structure

4.9 × 3.1 mm



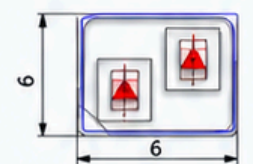
50° inclination

5.5 × 4.7 mm



35° inclination

5.3 × 5 mm



UV source

6 × 6 mm

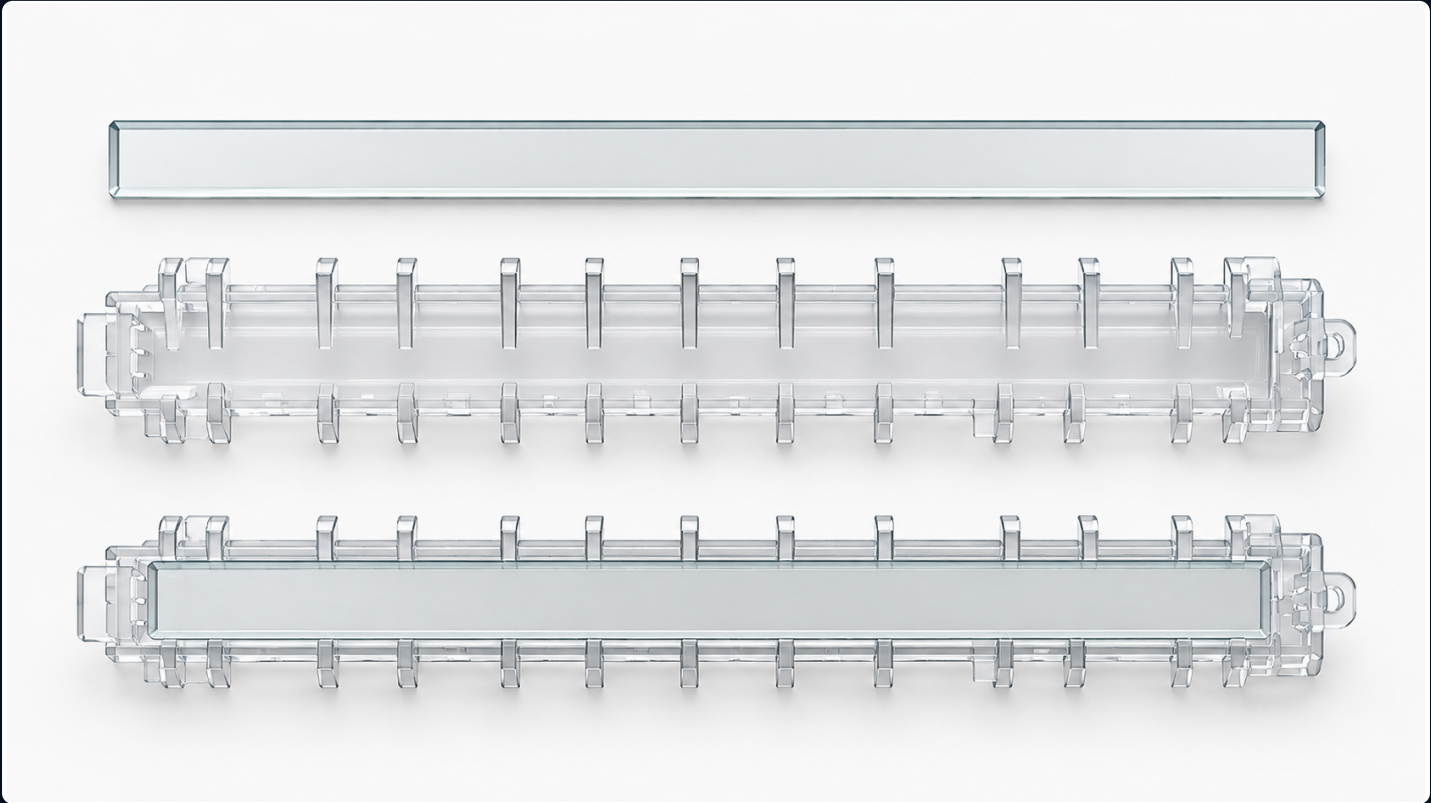


Dimensions in mm. Light guide geometry and illumination are defined for the selected configuration.

MECHANICAL INTEGRATION

Glass and covers

Glass and cover selection forms part of the CIS mechanical configuration.



Glass and toothed covers – illustrative view

Component	Features
Glass	Protects the inside of the CIS from dust. Thicknesses: 0.7; 1.1; 1.8 mm. Glass thickness affects the focal position. Chamfered edges help reduce paper jams.
Plastic cover	Shape can be customised to suit integration requirements. Manufactured by injection moulding.

Use the mechanical drawing of the selected configuration to determine overall dimensions, mounting and document position.



CONFIGURATION AND CONTACTS

Define your configuration

For technical or sales enquiries, send EHEC the key details of your application.

Information	Details to provide
Application	Machine, document type and required reading function.
Imaging	Required active width, resolution, transport speed and number of channels.
Technology and illumination	CIS, MIS or DIS; reflection, transmission, visible, IR and UV as required.
Integration	Available space, document distance, interface and power supplies.
Project and supply	Sample quantities, expected volumes and project schedule.

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Final specifications, available options and delivery times are confirmed for the requested configuration. The images show imaging examples and do not replace testing with samples from the intended application.