

CARD PERSONALIZATION & MAILING

PRODUCT OVERVIEW



CONTENTS

MÜHLBAUER GROUP AT A GLANCE.....	4
MANUFACTURING EXECUTION SYSTEMS	6
SHEET PERSONALIZATION	
ASP 280 / ASP 2800	8
CARD PERSONALIZATION - SMALL-VOLUME	
CRT 125	10
SCP-I.....	12
CLP 60	14
SCP 60	16
CARD PERSONALIZATION – MID-VOLUME	
SCP 501 / 801 / 1501	18
CARD PERSONALIZATION – HIGH-VOLUME	
SCP 4000	20
SCP 6000 DOD	22
GSM 6000 / GSM 6000 plus	24
CCT 6000	26
eSIM.....	28
CARD SORTING	
CS 8000	30
MAILING	
INLINEMAIL	32
CARDMAILING SYSTEMS.....	34
SCP CARDPACK.....	36
PERSONALIZATION & QUALITY ASSURANCE	38
PRODUCT PORTFOLIO	39



MÜHLBAUER GROUP AT A GLANCE

MÜHLBAUER'S BUSINESS UNITS AND SITES

Founded in 1981 in the heart of Bavaria, the Mühlbauer Group has ever since grown to a leading global player in the fields of Parts & Systems, Semiconductor Related Products, Document Solution Related Products and TECURITY® Solutions. With around 3,500 employees, technology centers in Germany, Malaysia, Slovakia, the U.S.A. and Serbia and 35 sales and service locations worldwide, Mühlbauer created a strong competence network around the globe.

We continuously invest in the latest technologies and innovative processes to enhance our competences and provide you with optimized solutions. Our in-house precision part production MPS – Mühlbauer Parts & Systems – guarantees unlimited flexibility and highest customer satisfaction.

Our business unit AUTOMATION does not only develop and assemble individually customized production systems, but also provides matching software solutions for the production process of Document and Solution Related Products. Vision inspection technologies as well as semiconductor and RFID applications complete our comprehensive portfolio.

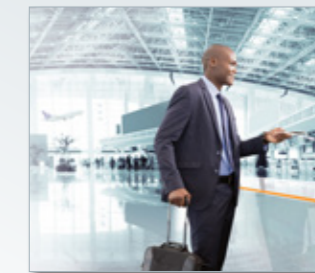
Our business unit TECURITY® is established as a competent partner for the implementation of security systems for identifying and verifying both documents and individuals. Our clients benefit from more than three decades experiential value which we have gained during the realization of over 300 ID projects worldwide.



MPS
Precision Parts & Surface Engineering



AUTOMATION
Production Equipment & Systems



WORLD OF TECURITY®
Government & Technology Solutions



MANUFACTURING EXECUTION SYSTEMS

MB MCES PERSONALIZATION MANAGEMENT

MB MCES is a personalization management software, which integrates incoming data with product definitions and controls the associated physical and electrical personalization processes. MB MCES handles personalization data from a variety of different input methods and formats.

MB INCAPE INTEGRATED PRODUCTION MANAGEMENT SOFTWARE

MB INCAPE is Mühlbauer's Production Management Software for the production and personalization of electronic cards and documents (e.g. ID cards, ePassports, Driver's Licenses, EMV or GSM cards). Combining data management, production control and material management, the system allows for highly automated processes. It processes customer- and application-specific production, personalization, quality control and document delivery scenarios with highest solution flexibility.

MB PalaMax® TOTAL PROCESS TRANSPARENCY

MB PalaMax®, Mühlbauer's Smart Factory solution, is developed for card, tag or booklet productions, personalization factories and semiconductor backend shop floors to set and collect process data to monitor and improve the efficiency of production and personalization for later processing, visualization and statistical analysis.

MB tool.Leader CONNECTOR BETWEEN SYSTEMS

MB tool.Leader is a software package which consists of several applications and serves as a reliable link between the individual systems involved in the production process. By means of MB tool.Leader, the entire process chain – from the incoming order to the final precision part – can easily be monitored and controlled. This real-time machine monitoring guarantees an automated production process. Production errors can be detected and solved at an early stage. Thus, MB tool.Leader reduces the machine downtimes, which in turn leads to an increase of the machine's productivity by up to 20 percent.

FEATURES & ADVANTAGES

-  Configurable workflow steps regarding personalization, quality assurance & issuance
-  Fully-automated processing & production management
-  Scalability regarding different documents, machines & personalization locations
-  Flawless integration of Mühlbauer's material management system (MB WAREHOUSE)
-  Connection to card / document management systems via web service, database, file-based interface
-  Standard interface to personalization machines with integration of third-party machines possible
-  Integration of MB User Management
-  Full coverage of production control requirements (security industry & EMV standards)
-  Seamless connection to MB PalaMax® & MB Data Preparation
-  Simplified administration due to web-based operator clients
-  Monitoring of real-time performance of the production
-  Seamless tracking of documents from point of production to issuance
-  Statistical tool analyze collected data & deliver customized statistics on OEE
-  Tool which enables the remote operation of machines on the shop floor from a control centre
-  Tool which increases effectiveness & efficiency so that production becomes more profitable
-  Enables production engineering to prepare & test a repeatable factory set-up. Factories can switch between products within minutes.



ASP 280 & ASP 2800

SHEET PERSONALIZATION SYSTEM

Mühlbauer's ASP series is designed for the individual printing of single foil layers in a reel-to-sheet production process. The systems are part of the Mühlbauer Color Family for MB EMBEDDED PICTURE technology and especially suited for the production of polycarbonate based ID cards or passport holderpages. The ASP is the result of successful customer-proven compo-

nents and systems. The special ink cartridge system uses two ink cartridges that automatically switch between ink tanks, allowing for a continuous production. The ASP is equipped with the proven personalization platform MB MCES and can be integrated into a production and personalization management system such as Mühlbauer MB INCAPE.



ASP 280



ASP 2800

KEY MODULES ASP 280

- Reel input
- Solvent inkjet printer
- Standard cutting unit
- Sheet output

KEY MODULES ASP 2800

- Reel input
- Solvent inkjet printer
- High accuracy cutting unit
- Separate reject bin
- Vision inspection
- Pick and placer
- Sheet output

ASP 280 & ASP 2800

FEATURES & ADVANTAGES

KEY FEATURES

- High accuracy cutting unit
- Fully automatic quality monitoring
- Fully automatic output stacking
- The sheet personalization line is a system for the individual printing of core / overlay layers for card / passport production or other similar applications
- Latest technology and know-how standards
- Online support available
- MB MCES / MB INCAPE ready

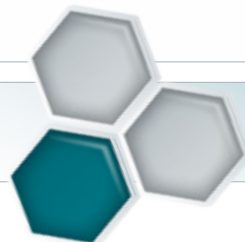
PRODUCTIVITY / PROCESS UNITS

- Reel-to-sheet process
- Environmental conditions:
 - » Room temperature: 23°C; +/-3°C
 - » Humidity: 50%; +/-10%

TECHNICAL DATA

- Foil materials: PC, PVC, PVCA ABS, PET, PETG; others on request
- Foil width: From 250 mm to 600 mm
- Foil thickness: From 100 µm to 500 µm
- Print resolution: up to 1,440 dpi
- Inks: Yellow, Magenta, Cyan, Black
- Interface: Ethernet

SHEETS PER HOUR



CRT 125










SMALL-VOLUME CARD PERSONALIZATION - RETRANSFER CARD PRINTER

The Mühlbauer CRT 125 retransfer card printer is the culmination of technological development and the most innovative card printer available for all types of card issuing applications. Its thermal retransfer printing engine is acclaimed for its quality and reliability by users worldwide. The CRT 125 is ideal for any

application such as single-side membership cards, gift cards, on demand ID cards and corporate and governmental ID cards. It combines proven, long-established technology with a compact and user-friendly body.



KEY MODULES

- | | | |
|--|---|---|
|  Card input |  Chip encoding
(contact and / or contactless) |  Card turning |
|  Card output tray |  Retransfer print |  Overlay lamination |
|  Magstripe encoding
(ISO HiCo, LoCo) |  Card cleaning |  Lamination unit
(reel-to-reel for patches) |

CRT 125

FEATURES & ADVANTAGES

KEY FEATURES

- Thermal retransfer printing engine
- Worldwide proven technology and system
- Real edge-to-edge printing
- MB MCES / MB INCAPE ready

PRODUCTIVITY / PROCESS UNITS

- Card input and output with 100 cards capacity
- Dye diffusion UV printing unit
- IP Sec protocol
- YMCKPO ink ribbon (peel off) in lineup
- Intuitive, flexible function LCD panel
- Removable water-washable cleaning roller
- Security locks on hopper and front door
- In-line chip coding (optional)
- In-line lamination unit (optional)
- Environmental conditions:
 - » Room temperature: 23°C; ±3°C
 - » Humidity: 50%; ±10%

TECHNICAL DATA

- Card types: format / materials ID-1 cards / PC, PVC, ABS, PET, PETG,
- Print resolution: 300 dpi
- Interface: Ethernet
- IC Module types:
 - » Processor modules: T=0 / T=1
 - » Memory modules: I2C bus / 2;3-wire
 - » Contactless: ISO 14443 / 15693
- Print speed: up to 120 cards per hour
- Throughput: up to 120 cards per hour; depending on process



SCP-I









SMALL-VOLUME PERSONALIZATION SYSTEM FOR INSTANT ISSUANCE

The instant issuance of cards provides a high level of flexibility and convenience for the card holder due to immediate personalization and activation of cards in shortest time. Whether in case of emergency replacement or new customer fitting, the clients achieve a maximum of satisfaction while the costs for delivery and mailing are minimized. Such innovative services, however, must be easy, secure, fast and reliable. Mühlbauer's SCP-I is a desktop card personalization system of the latest generation and fulfils all these demands. This system excels with cost-efficient sub-systems and technologies, but nevertheless provides

the highest operator and service friendliness, as well as perfect quality end results. Small footprint, compact size and low weight are further characteristics of the card personalization device. It is designed for typical banking personalization tasks and can be provided with the common standard personalization processes such as magnetic stripe encoding, chip encoding, dye sublimation thermal transfer printing and embossing. Together with Mühlbauer's Instant issuance Software a complete instant issuance solution can be set up. Therewith the Mühlbauer group provides a complete one-stop-shop solution for this business field.



KEY MODULES

- | | | |
|--|---|---|
|  Card input manual/automatic |  Dye sublimation color print |  Card output |
|  Magstripe encoding (ISO HiCo, LoCo) |  Card turning |  Reject bin |
|  Chip encoding (contact and / or contactless) |  Embossing | |

SCP-I

FEATURES & ADVANTAGES

KEY FEATURES

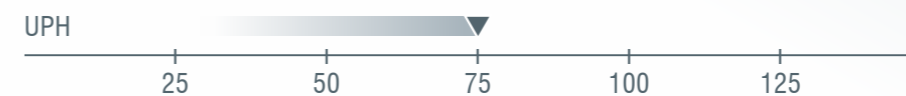
- Small and compact turnkey solution for instant card issuance
- Solid steel-sheet housing and system design
- Latest technology and know-how standards
- New generation of dye-sublimation D2T2 printing track printer with ICC color profile
- Online support available
- Application programming interface (API)
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card input feeder (manual feeding of single cards or automatic feeding through 5-fold buffers)
- Magnetic stripe encoding
- Chip encoding contact / contactless / dual interface
- Dye diffusion thermal transfer printing system
- Embossing / indent printing system
- Card output / option reject bin lockable
- MB MCES offline development workstation (SDK) (optional)
- Environmental conditions:
 - » Room temperature: 23°C; ±3°C
 - » Humidity: 50%; ±10%

TECHNICAL DATA

- Card types: format / materials: ID 1 cards / PVC, ABS, PET, PETG; others on request
- Magstripe encoding: write/ read module, HiCo, LoCo
- IC Module types: Processor modules: T=0 / T=1
- Memory modules: I2C bus / 2;3-wire
- Contactless: ISO 14443
- Print resolution D2T2: up to 300 dpi/600 dpi
- Interface: Ethernet
- Throughput: up to 75 cards per hour; depending on process



CLP 60

CARD PERSONALIZATION SYSTEM

Mühlbauer's CLP 60 is a desktop card personalization system of the latest generation. The throughput is up to 150 cards per hour. With more than 100 systems installed and more than 20,000 documents produced, the CLP series is successfully customer proven. This system is the best solution for decentralized laser engraving for ID cards, driver's licences and other Smart Cards

based on ID-1 format. It provides the same quality as high volume systems. The small size, low weight and the compact design makes it easy to handle and to move. The machine has an intuitive user interface and can be operated by a touchscreen. The CLP 60's personalization tasks are suitable for all contact, contactless and dual interface cards.



KEY MODULES



Card input stacker



Vision inspection



Card output stacker



Chip encoding
(contact and / or contactless)



Laser engraving

CLP 60

FEATURES & ADVANTAGES

KEY FEATURES

- Compact industrial designed desktop personalization system
- Suitable for customized personalization requirements
- Offers the same personalization quality as mid and high volume Mühlbauer personalization machines
- Direct service and quick reaction time (no third party laser supplier involved)
- Optimized silent cooling system
- Integrated laser suction unit with active carbon fibers
- MB MCES or MB MCE including MB Product Designer
- Data connection to network and other external data bases
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS / FEATURES

- Card feeding from input stacker with long autonomy time with up to 200 cards
- Additional manual card feeder for fast track production requirement
- Lockable input/output with viewing window for easy card volume monitoring
- Chip coding contact / contactless / dual interface
- Laser engraving system incl. viewing window
- Vision control systems with LED-flashlight system for both card sides
- Turning station for front- and backside laser engraving incl. swivel unit in y-direction
- Cards swivel unit in x- and y- axis for security laser applications (CLI, MLI) and laser alignment
- Color touch screen display with Mühlbauer GUI
- Retractable handles for easy system movement/ transport

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG, metal cards; others on request
- IC Module types: Processor modules: T=0 / T=1
- Memory modules: I2C bus / 2;3-wire
- Contactless: ISO 14443 / 15693
- Interface: Ethernet
- Throughput: up to 150 cards per hour; depending on process
- Operator access control optional
- Auto alignment function
- Guarantees constant laser personalization result on all installed equipment
- Ideal for decentralized solution with quality consistency on all sites

UPH



SCP 60












DESKTOP CARD PERSONALIZATION SYSTEM

Mühlbauer's SCP 60 is a desktop card personalization system of the latest generation. It is the result of successful custom-proven components and systems. The throughput is up to 200 cards per hour. This system excels with cost-efficient sub-systems and technologies, while providing highest operator and service convenience as well as perfected quality. The absolute highlight of the SCP 60 is its fully modular design. This design allows for tailor-made solutions with Mühlbauer's

standard modules and is easily expandable and interchangeable to support different applications. All known processes can be integrated to customer requirements. The SCP 60 is upgradable on-site which is unique in the desktop card personalization market. Although being a desktop system, the SCP 60 is equipped with the proven personalization platform MB MCES and can be integrated into a production and personalization management system such as MB INCAPE.



KEY MODULES

- | | | |
|--|--|--|
|  Card input stacker |  Embossing |  Lamination unit (reel-to-reel for patches) |
|  Magstripe encoding (ISO HiCo, LoCo) |  Card cleaning (integrated in D2T2 station) |  Vision inspection |
|  Chip encoding (contact and / or contactless) |  Dye sublimation color print |  Card output stacker |
|  Laser engraving |  Inkjet colorprint | |

SCP 60

FEATURES & ADVANTAGES

KEY FEATURES

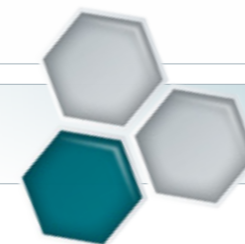
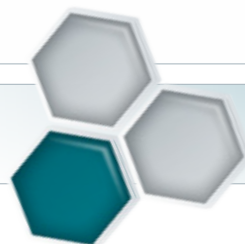
- Desktop personalization system for personalization tasks, technologies & processes
- Suitable for customized personalization requirements
- Fully modular design
- New generation of color print option with ICC color profile
- Option of metal card processing
- MB MCES or MB MCES including MB Product Designer
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card feeding from input stacker (single or multiple units)
- Card output stacker (single or multiple units) with separate reject card bin
- Magnetic stripe encoding
- Chip coding contact / contactless / dual interface
- Laser engraving system
- Dye diffusion thermal transfer print; optional UV printing unit, card cleaning & turning station
- Inkjet printing
- Lamination / patch applying
- Embossing / indent printing system
- Vision control systems with LED-flashlight system for both card sides
- Operator identification by biometric verification on request
- MB MCES offline development workstation (SDK) (optional)
- Environmental conditions:
 - » Room temperature: 23°C; +/-3°C
 - » Humidity: 50%; +/-10%

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG, metal cards; others on request
- Magstripe coding: write / read modules, HiCo, LoCo
- IC Module types: Processor modules: T=0 / T=1
- Memory modules: I2C bus / 2;3-wire
- Contactless: ISO 14443 / 15693
- Interface: Ethernet
- Throughput: up to 200 cards per hour; depending on process



SCP 501 / 801 / 1501

MID-VOLUME PERSONALIZATION SYSTEM FOR ID CARDS AND EMV CARDS

Mühlbauer's SCP series is a card personalization system for different ID and banking card applications. The machines boast a cost-efficient design, while providing highest operator and service friendliness as well as impeccable quality. The SCP series is available with an optionally wireless operated panel made according to the latest contactless network industry standards. The operator gains free moving space, unknown in the card business to date. The modular machines combine current Mühlbauer technology, featuring for instance the combination

of laser engraving and dye sublimation color printing with an integrated lamination unit, or the unique Mühlbauer matrix embossing system. In addition, the SCP series includes modules for contact based and / or contactless chip encoding. All machines are built on an identical basis and are available with a different throughput from 500 to 1,800 cards /hour, upgradeable on-site. Equipped with the proven personalization platform MB MCES software and hardware can easily be adapted and integrated into existing personalization environments.



KEY MODULES

- | | | |
|--|--|---|
| Card input stacker | Dye sublimation color print | Laser engraving |
| Barcode reader | Overlay lamination (clear overlay and patch) | Vision inspection |
| Magstripe encoding (ISO HiCo, LoCo) | Inkjet colorprint | Data verification |
| Chip encoding (contact and / or contactless) | Embossing | Label application |
| Card cleaning | Braille | Card sorting |
| Thermo-transfer print | Card turning | Card output stacker (conveyor, stacker or magazine) |

SCP 501 / 801 / 1501

FEATURES & ADVANTAGES

KEY FEATURES

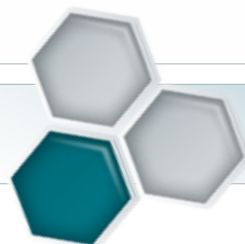
- Highly modular industrial system design for customized personalization requirements
- New generation of color print option
- Worldwide unique matrix embossing system
- Option for metal card processing
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card feeding from input and output stacker or magazine (single or multiple units)
- Friction and scratch free card separation with integrated double card detection system
- Magnetic stripe encoding HiCo, LoCo
- Chip coding contact / contactless / dual interface – up to 24 fold
- Thermo-transfer printing / dye diffusion UV printing unit
- Monochrome inkjet printing black / white
- Powerful color inkjet system (drop on demand)
- Special color inkjet solution for PVC and PC cards
- Laser engraving (single or multiple stations possible)
- In-line vision control systems with LED-flashlight system
- Security locks on all module doors
- Matrix embossing / indent printing system
- Labeling unit to apply labels
- Card sorting module
- MB MCES offline development workstation (SDK) (optional)
- In-line mailing system available
- Environmental conditions:
 - » Room temperature: 23°C; +/-3°C
 - » Humidity: 50%; +/-10%

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG; others on request
- Magstripe coding: write / read modules, HiCo, LoCo
- IC Module types:
 - » Processor modules: T=0 / T=1
 - » Memory modules: I2C bus / 2;3-wire
 - » Contactless: ISO 14443 / 15693
- Interface: Ethernet
- Throughput: SCP 501 – up to 500 cards per hour, SCP 801 – up to 800 cards per hour, SCP 1501 – up to 1,800 cards per hour; depending on process



SCP 4000












HIGH-VOLUME PERSONALIZATION SYSTEM

Mühlbauer's SCP 4000 is the result of years of intensive technical and software development efforts. The machine boasts a cost-efficient design, while providing highest operator and service friendliness as well as impeccable quality. The SCP 4000 offers an optional wireless operator panel that has been designed according to the latest contactless network industry standards. The operator gains free moving space, unknown in the card business to date. The machine combines current Mühlbauer technology. One of the main highlights is the addi-

tional flexibility provided by the different input / output systems for highest autonomous running time (for up to eight magazines). In addition, they include modules for contact based and / or contactless chip encoding. The completely new designed graphical user interface supports the operator in the best possible way. Of course the machine is equipped with the proven personalization platform MB MCES and can be integrated into a production and personalization management system such as Mühlbauer MB INCAPE.



KEY MODULES

- | | | |
|---|--|---|
|  Card input stacker |  Chip encoding (contact and / or contactless) |  Data verification |
|  Barcode reader |  Laser engraving |  Card sorting |
|  Magstripe encoding (ISO HiCo, LoCo) |  Card turning |  Multi card output (stacker or magazine) |
|  Card cleaning |  Vision inspection | |

SCP 4000

FEATURES & ADVANTAGES

KEY FEATURES

- High-speed personalization system for personalization tasks, technologies and processes
- Highly modular and flexible system design for ID or banking card production
- Parallel processing concept to ensure highest throughput and flexibility
- Latest technology and know-how standards
- Suitable for customized personalization requirements
- Option for metal card processing
- Easily upgradeable / switching of process modules
- MB MCES or MB MCES including MB Product Designer
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card feeding from input stacker or magazine (single or multiple units)
- Friction and scratch free card separation with integrated double card detection system
- Card output stacker or magazine (single or multiple units) with separate reject card bin
- Automatic magazine changer, -buffer or multi-job systems (optional)
- Available process modules:
 - » Magnetic stripe encoding – up to 2-lanes in parallel
 - » Chip coding contact / contactless / dual interface; up to 128 stations
 - » Laser engraving system – parallel laser system – up to 8-fold
 - » In-line vision control systems with LED-flashlight system for both card sides
- Security locks on all module doors
- Operator / service / administrator identification by biometric verification on request
- Customized process modules on request
- Environmental conditions:
 - » Room temperature: 23°C; ±3°C
 - » Humidity: 50%; ±10%

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG
- Magstripe coding: write / read modules, HiCo, LoCo
- IC Module types:
 - » Processor modules: T=0 / T=1
 - » Memory modules: I2C bus / 2;3-wire
 - » Contactless: ISO 14443 / 15693
- Interface: Ethernet
- Throughput: up to 4,000 cards per hour; depending on process



SCP 6000 DOD











HIGH-VOLUME PERSONALIZATION SYSTEM

Mühlbauer's SCP 6000 is the result of years of intensive technical and software development efforts. The machine boasts a cost-efficient design, while providing highest operator and service friendliness as well as impeccable quality. The SCP 6000 offers an optional wireless operator panel that has been designed according to the latest contactless network industry standards. The operator gains free moving space, unknown in the card business to date. The machine combines current Mühlbauer technology. One of the main highlights is the ad-

ditional flexibility provided by the different input systems for highest autonomous running time (for up to eight magazines). In addition, they include modules for contact based and / or contactless chip encoding. The completely new designed graphical user interface supports the operator in the best possible way. Of course the machine is equipped with the proven personalization platform MB MCES and can be integrated into a production and personalization management system such as Mühlbauer MB INCAPE.



KEY MODULES

- | | | |
|--|--|---|
|  Multi card input (stacker or magazine) |  Chip encoding (contact and / or contactless) |  Card turning |
|  Barcode reader |  Laser engraving |  Vision inspection |
|  Magstripe encoding (ISO HiCo, LoCo) |  Inkjet printing |  Multi card output (stacker or magazine) |
|  Card cleaning | | |

SCP 6000 DOD

FEATURES & ADVANTAGES

KEY FEATURES

- Industrial designed high-speed personalization system for flat debit and credit cards
- Highly modular and flexible system design for ID or banking card production
- Parallel processing concept to ensure highest throughput and flexibility
- Latest technology and know-how standards
- Suitable for customized personalization requirements
- High-quality industrial inkjet printing
- Front and backside processing in one pass
- MB MCES or MB MCES including MB Product Designer
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card feeding from input stacker or magazine (single or multiple units)
- Friction and scratch free card separation with integrated double card detection system
- Card output stacker or magazine (single or multiple units) with separate reject card bin
 - » Automatic magazine changer, buffer or multi-job systems (optional)
- Available process modules:
 - » Magnetic stripe encoding
 - » Chip coding contact / contactless / dual interface; up to 128 stations
 - » Inkjet printing monochrome colors - black and white
 - » In-line vision control systems with LED-flashlight system
- Security locks on all module doors
- Operator / service / administrator identification by biometric verification on request
- Customized process modules on request
- Environmental conditions:
 - » Room temperature: 23°C; ±3°C
 - » Humidity: 50%; ±10%

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG,
- Magstripe coding: write / read modules, HiCo, LoCo
- IC Module types:
 - » Processor modules: T=0 / T=1
 - » Memory modules: I2C bus / 2;3-wire
 - » Contactless: ISO 14443 / 15693
- Interface: Ethernet
- Throughput: up to 6,000 cards per hour; depending on process



GSM 6000 & GSM 6000 PLUS

COST-EFFECTIVE PERSONALIZATION OF PAY-TV AND SIM CARDS (SINGLE, DUAL, QUARTER)

The GSM 6000 series is a modular platform for the electrical and graphical personalization of SIM cards and Pay-TV cards. With up to 24,000 SIMs per hour, the system reaches the highest throughput in the market worldwide. Besides single and double SIM cards, the GSM 6000 PLUS is even able to process quarter SIMs. The high-speed chip encoding solution combines a new combi head which is fully scalable. It requires no retrofitting and therefore guarantees for highest flexibility in production. With up to 128 parallel chip encoding units in 32 card slots, the system

reaches an incomparable performance where even longer encoding times of up to 18 sec. can be sustained without any loss in speed. A major advantage in regards to the graphical personalization stems from the integrated Mühlbauer high speed laser. It guarantees the highest laser lifetime of up to 75,000h (10 years+) and at the same time it offers higher quality, e.g. deep black and more robust graphical personalization result. Up to four Mühlbauer high speed laser systems can be integrated.



KEY MODULES

- Multi card input
- Barcode reader
- Chip encoding
- Laser engraving
- Card turning
- Vision inspection
- Labeler
- Multi card output

		GSM 6000	GSM 6000 PLUS
CHIP ENCODING	Single SIM	■	■
	Dual SIM	□	■
	Quarter SIM	-	■
LASER ENGRAVING	Fibre laser	■	■
	Grayscale laser	□	□
	CO ² laser	□	□
	Laser engraving units	up to 3	up to 4
	Card turning units	up to 3	up to 4
OPTIONS	Barcode Reader (QA)	□	□
	Camera/Vision System (QA)	□	□
	Labeler	-	□
MAX. THROUGHPUT IN SIMS/HOUR		12 000 (dual SIM) 6 000 (single SIM)	24 000 (quarter SIM) 12 000 (dual SIM) 6 000 (single SIM)

■ Standard □ Option - Not available

GSM 6000 & GSM 6000 PLUS

FEATURES & ADVANTAGES

KEY FEATURES

- Best price-performance ratio in the market
- Highest throughput in market: up to 24,000 SIM/h
- High-speed chip encoding technology
- Single/Double/Quarter SIM capability
- Combi head with no retrofit for highest flexibility
- Up to 4 high-speed laser systems
- Highest lifetime > 75,000h for laser diode (10 y.+)
- Magazine changing system, up to 4,500 cards

PRODUCTIVITY / PROCESS UNITS

- Input
 - » Automatic card reloading for reduced manning
 - » Card feeding from input magazine; optionally from input stacker
 - » Double card detection sensor integrated
- Chip Encoding
 - » High speed chip programming solution from Mühlbauer
 - » Processing of 6-pin and 8-pin contact based chips
 - » Programming of contact and contactless cards
 - » Up to 128 coding heads in parallel for even longer coding time > 18 sec
- Laser Engraving
 - » Integrated high quality laser, with best performance regarding quality, precision, cost and speed
- Output
 - » Card stacking into output magazine; optionally into output stacker
 - » Separate card reject bin
 - » Configurable sorting

TECHNICAL DATA

- Card materials: PC, PVC, ABS, PET, PETG
- Card format: ID-1
- Security locks on all module doors
- Operator, service, administrator identification by biometric verification (optional)
- Interface: Ethernet
- MB MCES or MB MCES including MB Product Designer
- MB INCAPE & MB PalaMax® ready



CCT 6000






HIGH-VOLUME PRE-PERSONALIZATION AND QUALITY ASSURANCE SYSTEM FOR CUSTOMIZED CARD APPLICATIONS

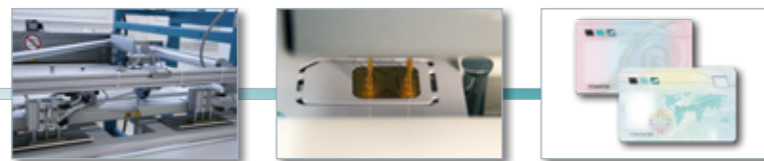
With the CCT 6000 Mühlbauer offers a milestone in card personalization solutions: A highly flexible development basis for customized card applications. Input and output are the only fixed modules. And even here you can choose between standard magazine feeders or volume magazine changers for high autonomy times. All other process stations can be freely configured

by the customer, whether they are set up onto existing process units or have to be completely developed. Seven free stations per module provide a flexibility never realized in the card industry before. CCT 6000 is the best platform to realize your ideas. Thereby, it reaches a maximum mechanical throughput of 6,000 cards per hour.



KEY MODULES

-  Multi card input
-  Barcode reader
-  Chip encoding (contact and / or contactless)
-  Laser engraving
-  Card turning
-  Vision inspection
-  Data verification
-  Multi card output



CCT 6000

FEATURES & ADVANTAGES

KEY FEATURES

- High-speed pre-/personalization system, technologies and / or special test processes
- Wide range of customization possible
- Most flexible individual process module development and integration
- Easy upgradeable / switching of process modules
- MB MCES or MB MCES including MB Product Designer
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card feeding from input stacker or magazine (single multiple units)
- Friction and scratch free card separation with integrated double card detection system
- Card output stacker or magazine (single or multiple units) with separate reject bin
- Automatic magazine changer and buffer systems (optional)
- Project / client depending integration of necessary process units for:
 - » Chip pre-personalization / personalization, special tests etc.
 - » Printing on card surface by laser technology
 - » Contact and / or contactless
 - » Optical, mechanical, electrical control and processing units
 - » Card sorting functionality
 - » Customized processing units
- Security locks on all module doors
- Operator / service / administrator identification by biometric verification on request
- Environmental conditions:
 - » Room temperature: 23°C; ±3°C
 - » Humidity: 50%; ±10%

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG,
- IC Module types:
 - » Processor modules: T=0 / T=1
 - » Memory modules: I2C bus / 2;3-wire
 - » Contactless: ISO 14443 / 15693
- Customized processing units: up to 7 positions
- Interface: Ethernet
- Throughput: up to 6,000 cards per hour; depending on process

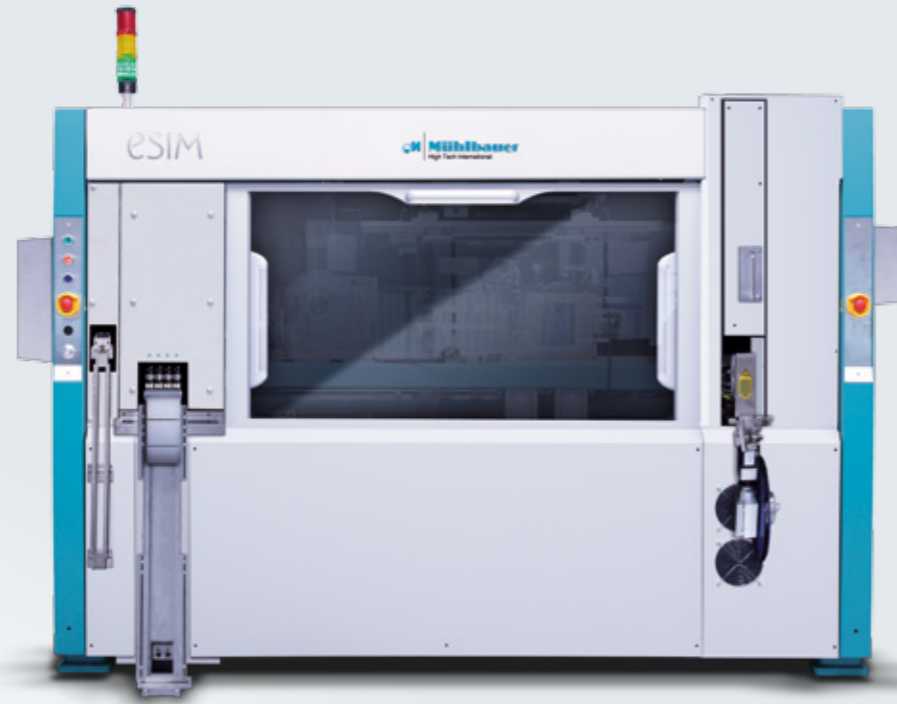


eSIM

eSIM PERSONALIZATION SYSTEM

The MB eSIM PERSO was developed to exactly meet the dynamic connectivity requirements of the future. Micromodules that can perform a multitude of functions with high processing capacity need proper handling. With over 25 years of experience in the semiconductor industry as well as expertise in handling the smallest devices mainly in the area of WLCSP and die sorting and packing into tape and reel. All components of the system

as well as the software have been highly integrated and optimized for maximum power, speed and quality. Through the 100% in-house development, we guarantee shortest service reaction times and high spare parts availability. Depending on your application and your desired production volume our experts can provide you with the most suitable laser solution:



KEY MODULES

-  Tape & Reel input
-  Laser personalization
-  Repack in tape and reel in sequence
-  Encoding / Verification
-  Electronical & optical verification
-  Infrared inspection



eSIM

FEATURES & ADVANTAGES

KEY FEATURES

- Fastest system on the market with up to 4200 UPH
- High speed encoding - Up to 36 parallel encoding stations
- Most precise handling system on the market: Mühlbauer can handle the smallest WLCSP's/BGS's down to 2x2 mm
- Highest yield with less rejects: Integration of a vision controlled positioning before placement into the test nest enables precise contacting

PRODUCTIVITY / PROCESS UNITS / FEATURES

- Feeder bench & one input feeder
- Pick & Place head input
- Preparation tray
- MB test nest bar (incl. coding pins) 12 folds
- MB coding unit (MB MCEs / SmartWareReader) 12 folds / Optional 24 / 36 folds
- Pick & Place head transfer (pick all at a time)
- MB Laser personalization
- Electronic & optical verification
- Preparation & parking tray
- Reject box with output indexer
- Pick & Place head output
- Output tape & reel indexer

TECHNICAL DATA

- 12 / 24 / 36 fold handling
- Different form factors
- Carrier tape width of 8, 12, 16 mm
- Various input handling: reel, tray, wafer
- Throughput: up to 4,200 cards per hour



CS 8000

CARD SORTING SYSTEM

The CS 8000 is an automatic card inspection / verification and sorting system, adaptable to individual customer requirements. By an automatic self-learning vision process for unknown / new product designs, a user-friendly operation without additional specialist trainings is feasible. Additional and individual configurable processes allow a flexible inspection / verification of already personalized and / or blank card bodies, to sort these into different output trays. These machines can be placed in government as

well as in industrial production areas. Own developed Software allows the protocolling of the inspected / verified products either without or with connection to MB MCES (personalization management system) and customer database. With an UPH of up to 8000 cards per hour, the CS 8000 is the basic, for a solid process flow in your production / personalization area and supports to reduce human influences.



KEY MODULES



Card input



Chip verification / test



Vision inspection



Magnetic stripe verification



Card turning



Card output sorting

CS 8000

FEATURES & ADVANTAGES

KEY FEATURES

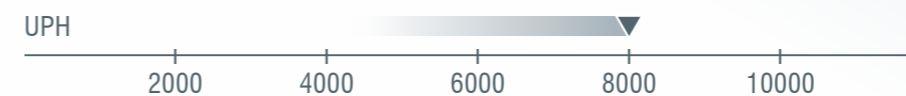
- Vision Inspection with self-learning process (operator friendly)
- Protocolling function (e.g. quality control, tractability, ...)
- 100% control of blank cards and/or personalized cards
- Flexible sorting of cards into different output units, adaptable to customer requirements
- Extendable machine concept
- Card verification / test via chip (optional)
- Card verification via magstripe reader (optional)
- Machine operation with or without (external) database connection possible
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Variable card input configuration (1 - n units)
- Vision Inspection
 - » Card quality check (print, punch accuracy, magstripe positioning,...)
 - » Automatic card type recognition
 - » Self-learning functionality for unknown / new products
 - » Individual card identification (e.g. by serial number)
 - » Barcode reading
- Note: Additional functions on request.
- Card turning device
- Card verification / test via chip (single, parallel) (optional)
 - » Contact
 - » Contactless
 - » Combined
- Card verification via magnetic stripe (optional)
- Card output sorting (5 - n units)

TECHNICAL DATA

- Throughput: up to 8000 cards/hour
- Card format: ID 1 (CR80)
- Card material: PC, PVC, ABS, PET, PETG, Carton, others on request
- Chip reader:
 - » Contact according ISO/IEC 7816-3 and ISO7816-4
 - » Contactless according ISO14443 A/B, ISO15693, Mifare ...
- Magstripe verification: Reader module, HiCo, LoCo according ISO 7811-2 and -6
- Interface: Ethernet (optional)

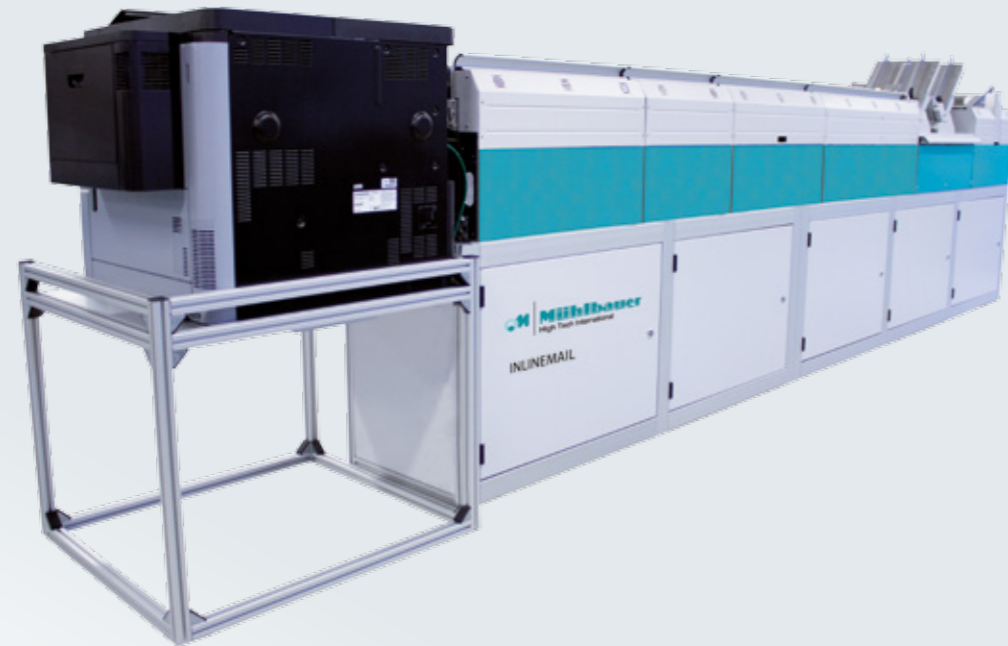


INLINEMAIL

CARD PERSONALIZATION AND MAILING IN-LINE SYSTEM

With the process unit INLINEMAIL, Mühlbauer presents a revolutionary concept for more efficient mailing of cards. This machine extension concept for SCP 501 / 801 / 1501 is based on many years of experience with systems in production. It is the result of years of intensive technical and software development efforts.

The modules boast a cost-efficient design, but nevertheless provide highest operator friendly service as well as excellent quality. With a throughput of up to 1,500 envelopes per hour, the extension process unit INLINEMAIL is an ideal solution for mid volume in-line mailing.



KEY MODULES

- | | | |
|--|--|---|
| Carrier printer | Enclosure stations | Label application (hot melt process optionally available) |
| Carrier buffer, sheet separation and alignment | Carrier sheet collecting | Multifolding |
| Barcode reader 1D, 2D for online carrier-card-matching | Envelope inserting, humidification & closing | Check weigher (optional) |
| Card affixing | Reject bin | Output conveyor (optional) |
| Cards-on-carrier verification (sensoric system or vision inspection) | | |

INLINEMAIL

FEATURES & ADVANTAGES

KEY FEATURES

- In-line mailing system for card mailing and finishing
- Suitable for in-line mailing attached to SCP series
- Latest technology and know-how standards
- Various integration of in-line quality control features
- MB MCES or MB MCES including MB Product Designer
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card feeding by card handover from personalization system
- In-line or off-line printer systems for letter printing
- Up to 4 card attachable per letter
- Up to 2 attachment inserting stations
- Weight-check and postaging unit (optional)
- Optical / electrical control systems available
- Security locks on all module doors
- Operator / service / administrator identification by biometric verification on request
- Environmental conditions:
 - » Room temperature: 23°C; ±3°C
 - » Humidity: 50%; ±10%

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG,
- Letter formats: A4, A5, A5 horizontal, US letter, US legal
- Envelope formats: C6, C5/6 (DIN long), C5, No. 9, No. 10, A10
- Folding types: C- / Z- / V- (half) / Double-parallel
- Card / letter matching: Chip, magnetic stripe, optical (vision or barcode reader)
- Interface: Ethernet
- Throughput: up to 1,500 envelopes per hour; depending on process

COMBINED CARD PERSONALIZATION AND MAILING



CARDMAILING SYSTEMS

STANDALONE MAILING SYSTEMS

Mühlbauer's CARDMAIL series enables personalized cards to be sent to the card holders quickly, easily and reliably. Different quality assurance systems guarantee the exact match between cards and documents.

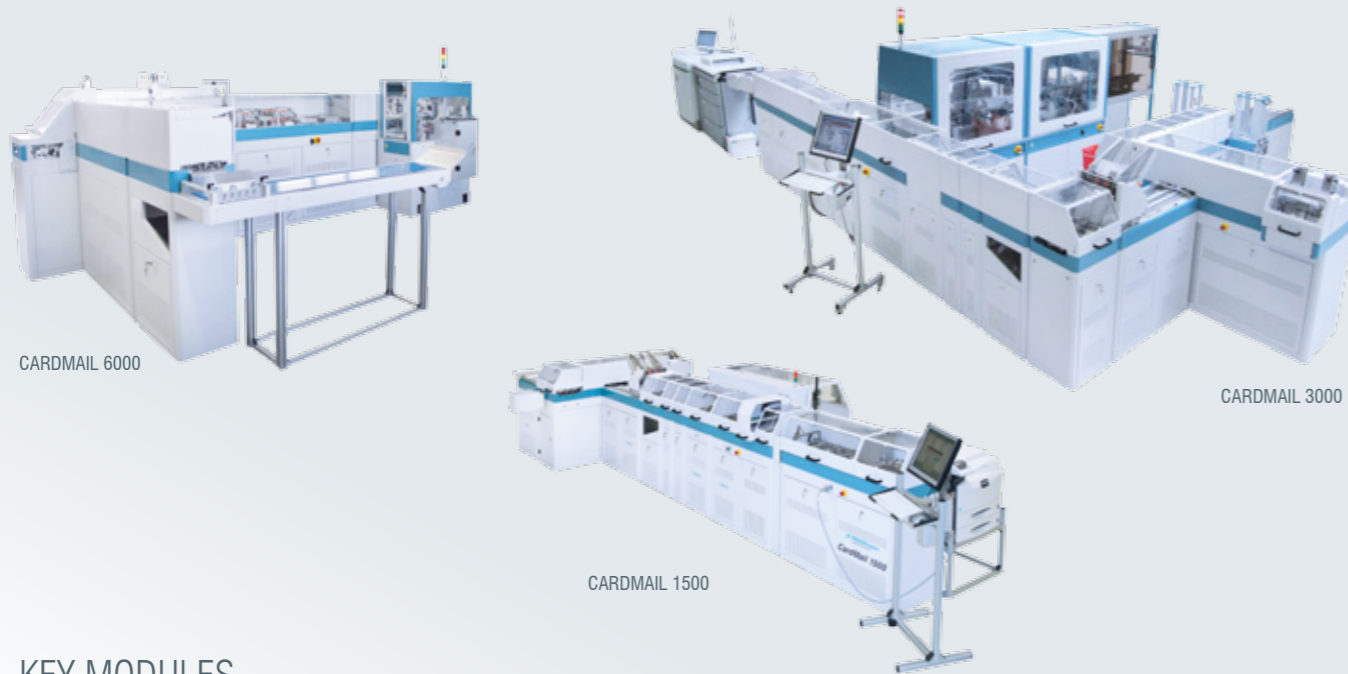
CARDMAIL is a fully modular system with a completely flexible and adaptable design ready for any future demands and ensuring 100% investment protection.

Complete in-house system development and manufacturing

guarantees the quality levels you have come to expect from Mühlbauer machines.

CARDMAIL works with the open and universal Mühlbauer personalization platform MB MCES as well as the production and personalization management system MB INCAPE.

A large number of CARDMAIL systems has already been installed throughout the world with the tried and tested Mühlbauer technology.



KEY MODULES

- Carrier printer
- Carrier buffer, sheet separation and alignment
- Barcode reader 1D, 2D for online carrier-card-matching
- Label application
- Carrier pre- and post-folding
- Carrier sheet collecting
- Card input and verification (option for stand-alone-version: mag-stripe, chip readers, vision inspection)
- Card affixing
- Cards-on-carrier verification (sensoric system or vision inspection)
- Turning stations
- Enclosure stations
- Reject bin
- Envelope inserting, humidification & closing
- Envelope inspection
- Check weigher (optional)
- Job separation
- Output conveyor (optional)
- Envelope sorting



CARDMAILING SYSTEMS

FEATURES & ADVANTAGES

KEY FEATURES

- Complete in-house system development for highest quality levels
- Latest technology and know-how standards
- Fully modular: easy upgrade and switch of process modules
- Stand-alone card mailing system
- Letter printing: in-line and off-line printers
- Interface for various carrier printers
- Monochrome printing; color printing (optional)
- Simplex and duplex page printing
- Card feeding from input magazine; from input stacker (optional)
- Double card detection sensor
- Card identification techniques optionally available: magstripe, chip reader (contact/contactless), barcode reader, vision camera system
- Card reject
- Card affixing by label dispenser
- Cards per letter: up to 6
- Attachment inserting stations: up to 12
- Card & letter matching by: sensor, barcode reader (optional), vision camera system (optional)
- Envelope quality assurance optionally available: checkweigher, barcode reader, vision camera system
- Envelope sorting modules (optional)
- Card materials: PC, PVC, ABS, PET, PETG
- Card format: ID-1, other formats on request
- Security locks on all module doors
- Operator, service, administrator identification by biometric verification (optional)
- Interface: Ethernet
- MB MCES or MB MCES including MB Product Designer
- MB INCAPE & MB PalaMax® ready

	CARDMAIL 1500	CARDMAIL 3000	CARDMAIL 6000
LETTER FORMATS	A4, US letter according to ISO 216	A4, US letter according to ISO 216	A5, A4 US letter, US legal according to ISO 216
ENVELOPE FORMATS	C5/6 (DIN long), C6/5 (DIN long +), C5	C5/6 (DIN long), C6/5 (DIN long +), C5	C5/6 (DIN long), C5, C6, No. 9, No. 10, A10
FOLDING TYPES	C- / Z- / V- (half)	C- / Z- / V- (half)	C-, Z-, V-fold or double-parallel-fold
PERFORMANCE	up to 1 500 envelopes/h	up to 3 000 envelopes/h	up to 4.500 envelopes/h



SCP CARDPACK










CARD PACKAGING AND DELIVERY SYSTEM

The SCP CARDPACK offline packaging represents a revolutionary concept ensuring the most efficient packing for the distribution of identity cards. This machine concept is based on many years of experience in the production of personalization and mailing systems. It is an optimized platform for individual processing of production orders. Thanks to the modular approach and latest control and monitoring mechanisms, the system is well prepared for future applications. High-performance compo-

nents ensure an increase in efficiency and a considerable reduction of maintenance requirements while being easy to operate. The SCP CARDPACK guarantees a clearly increased production output thus reducing the costs for personalization and issuance of cards. Due to the modular setup, the packaging system meets today's requirements regarding secure production and is prepared for future modifications and extensions.



KEY MODULES

- | | | |
|--|---|---|
|  Multi card input (stacker or magazine) |  Card turning |  Card banding |
|  Barcode reader |  Vision inspection |  Label application |
|  Chip encoding (contact and / or contactless) |  Card collecting |  Output conveyor |

SCP CARDPACK

FEATURES & ADVANTAGES

KEY FEATURES

- Industrial designed card packaging and delivery system
- Latest technology and know-how standards
- Various card identification and reader units selectable
- Card collection according to customized batch criteria
- MB MGES or MB MGES including MB Product Designer
- MB INCAPE & MB PalaMax® ready

PRODUCTIVITY / PROCESS UNITS

- Card feeding from input stacker or magazine (single or multiple units)
- Friction and scratch free card separation with integrated double card detection system
- Automated packaging batch selection by barcode identification and matching
- Automated card identification of each single card with dedicated reader unit(s)
- Automated counting and collecting of cards according to packaging criteria(s)
- Number of cards per package: 1 - 50
- Automated banding of each card package
- Printing of card package data onto sticker with applying unit
- Single output conveyor belt for finished card packages
- Operator / service / administrator identification by biometric verification on request
- Environmental conditions:
 - » Room temperature: 23°C; +/-3°C
 - » Humidity: 50%; +/-10%

TECHNICAL DATA

- Card types: format / materials: ID-1 cards / PC, PVC, ABS, PET, PETG,
- Card identification: IC processor module contactless based and contact based
- Barcode reading: Linear barcode (1D) or matrix barcode (2D)
- Vision inspection system: For OCR and OCV of document / serial numbers; 1D or 2D barcode reading / matching
- Interface: Ethernet
- Throughput: up to 4,000 cards per hour; depending on number of cards per package



PERSONALIZATION & QUALITY ASSURANCE

PERSONALIZATION & TESTING EQUIPMENT ACCORDING TO ICAO 9303 REQUIREMENTS

CHIP ENCODING - MB 1301



TECHNICAL DATA

- Dimensions: 100 x 80 mm
- Power: 24V DC (± 10 %)
- CPU: Dual Core CPU with 300 MHz
- RAM: 128 MB
- Flash Card Memory: 4 GB
- Network: TCP/IP: up to 10/100Mbit/sw
- Contact coding with up to 320 Kbit/s
- Advanced contact coding with up to 2 Mbit/s (1.8 V to 5.5 V)
- Contactless coding with up to 424 Kbit/s

SDK (Software Development Kit) available

The Reader electronic based on MB1301 is a flexible architecture to feed the different needs for personalization of contact and contactless Smartcards. The basis is an ARM based main board where the user can configure different stacking boards for coding.

CARD BODY TESTING EQUIPMENT



CSG 100 / 200
Card size gauge



CTG 100 / 200
Card thickness / cavity depth gauge



DLT 500
Peel force tester

SMART CARD TESTING EQUIPMENT



SCF 2300
Flexion test system



TWT 2500
Three wheel testing system



SCT 2400
Torsion test system



MAT 1230
Module adhesion testing system

CARD PERSONALIZATION TESTING EQUIPMENT



MEASURING MICROSCOPE
Measuring of embossing distances



COLOR DENSITOMETER
Measuring of color density



UV-LIGHT CABINET
Inspection of various printing processes

PRODUCT PORTFOLIO

YOUR ONE-STOP-SHOP TECHNOLOGY PARTNER

AUTOMATION

CARDS & ePASSPORTS

- IC Module Production
- Card Body & Smart Card Production
- Holderpage & Booklet Production
- Card & ePassport Personalization
- Packaging & Mailing

RFID / SMART LABEL

- Antenna Production & Inlay Assembly
- Converting
- Personalization

SEMICONDUCTOR BACKEND

- IC Module Production
- Carrier Tape Production
- Die Sorting

INDUSTRIAL INSPECTION SYSTEMS

- Packaging
- Metal Working
- Special Solutions

FUTURE TECHNOLOGIES

- Concentrator Solar Technology
- Flexible Solar Cell Technology
- Solar Panel Technology
- eSIM PERSO
- LED Technology

TECURITY®

- ID Card Solution
- ePassport Solution
- MB IDVERSO® Border Management Solution
- Driver's License & Vehicle Registration Solution
- Production Facilities

PARTS & SYSTEMS

- Precision Parts
- Surface Engineering

CONSULTING

- Identification of Customer Requirements
- Planning & Design
- Implementation
- Ongoing Operations

SERVICE

- Worldwide Locations for Service & Support
- Worldwide Spare Parts Supply
- Reaction Time & Full Service Contracts
- Service & Maintenance Management
- Updates & Upgrades
- Teleservice, Remote Access & Hotline (24 hours)
- Training & Support on Different Levels
- Production & Administration Support

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