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Procurement of Specialized equipment for personalizing polycarbonate cards

Technical Documents

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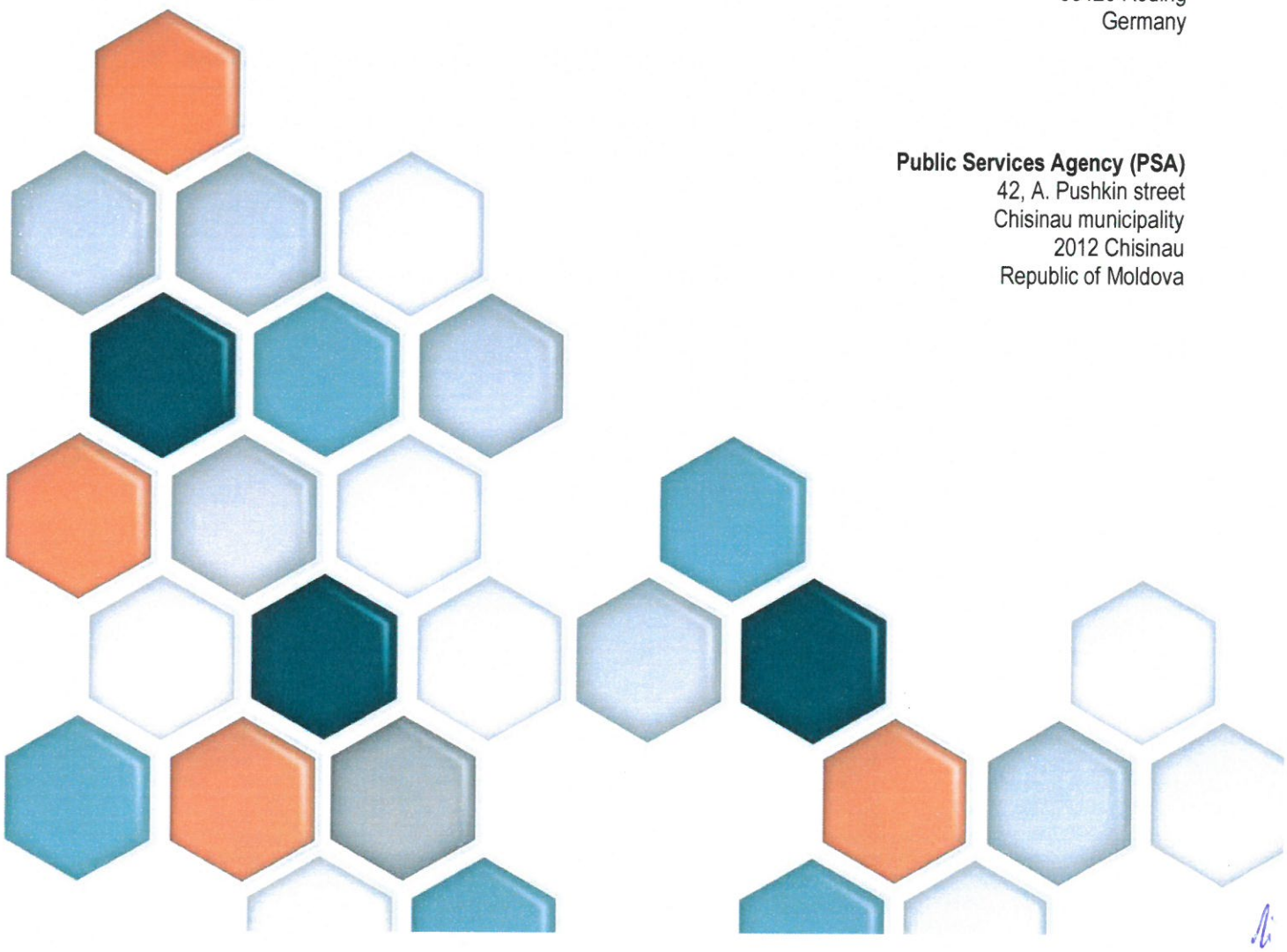

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Document History

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1 Technical Requirements and Compliance

General technical requirements for the Specialized equipment for personalizing polycarbonate cards:	
I. The main components of the specialized personalization equipment:	
1. A built-in computer with a hard disk, a licensed operating system on which the manufacturer's software for the personalizing system and integrated equipment will run.	
1.1 Integrated digital control panel (touchscreen) min.7"(inch)	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
1.2 TCP/IP system connection via Ethernet, LAN (1Gbit)	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
1.3 Licensed operating system: min. Windows 10	Compliant Please refer to chapter 2.5 Operating System Windows 10
1.4 External connectivity: min. HDMI, USB (optional)	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
1.5 The CPU, RAM, and Storage parameters of the computer must match the minimum cumulative operating requirements of the Windows operating system and the manufacturer's integrated software system, and should have sufficient redundancy.	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
2. Card feeding component of the input unit: with capacity of minimum 100 to maximum 250 cards	Compliant Please refer to chapter 2.2.2 Card Input Stacker 1-fold
3. Component for the primary verification of the cards: optical character (text and numerical data) verification and recognition, barcode(EAN, CODE39, CODE128), verification and preprint auto-correction and positioning. Alphanumeric data will be stored in various formats (for example: blank number, card number)	Compliant Please refer to chapter 2.2 Process Frame Input - Vision - Chip Coding
4. Contactless chip encoding component NOTE * There are no restrictions related to the manufacture of the chip encoding component exclusively by the equipment supplier. This component can be made either by the equipment vendor or by using a third-party integrated component. ** Regardless of who is the manufacturer of the chip encoding component used in the specialized equipment delivered for the personalization of polycarbonate cards, they must be accompanied by all necessary licenses, if applicable, related to the Intellectual Property Rights throughout the stated lifetime and without any limitations of the number of documents produced (type ID-1) through this equipment.	Compliant Please refer to chapter 2.2.9 Chip Encoding Contactless - 1-fold - MB 1301 Standard, 2.6 MCES - Mühlbauer Personalization Platform and 2.7 MCES Processing Module Chip Contactless
5. Basic technology unit laser engraving component capable of personalizing the front and back of ID-1 cards, automatically applying MLI or CLI security features as needed.	Compliant Please refer to chapter 2.3 Process Frame Laser Engraving - Patch Applying
6. The automated quality control module for the personalization: optical character (text and	Compliant

numerical data) verification and recognition, barcode(EAN, CODE39, PDF417) and QR-code verification and recognition, personalization quality verification and recognition NOTE * There are no restrictions of engineering design and fabrication during manufacturing of the laser engraving component to apply the security features.This component can be made either by the equipment vendor or by using a third-party integrated component. ** Regardless of who is the manufacturer of the laser engraving components used in the specialized equipment supplied for the personalization of polycarbonate cards, they must be accompanied by all necessary licenses, if applicable, relating to Intellectual Property Rights for the entire stated life period and without limitation of the number of documents produced (type ID-1) through this equipment.	Please refer to chapter 2.4 Process Frame Quality Check - Output
7. Storage component for the personalized cards, and separate rejected card storage container	Compliant Please refer to chapter 2.4.7 Card Output Stacker, 1-fold
II. Functional technical requirements of personalization equipment:	
• Personalization of ID-1 polycarbonate cards: card dimensions: 85.60 mm x 53.98 mm; Thickness of 0.76 mm ± 0.08 mm, according to ISO/IEC 7810	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
• Markup of textual data (TTF fonts), vector, raster graphics (images, signatures), as well as one- and two-dimensional barcodes (including PDF417 and QR codes)	Compliant Please refer to chapter 2.3 Process Frame Laser Engraving - Patch Applying
• Standard laser personalization features such as: transparent window, ghost image, tactile elements; advanced security features such as MLI / CLI	Compliant Please refer to chapter 2.3 Process Frame Laser Engraving - Patch Applying
• Double-sided personalization of polycarbonate cards, ID-1 format	Compliant Please refer to chapter 2.2.4 Extension - Turning under Camera, 2.3.4 Extension - Turning Station below Laser and 2.4.4 Extension – Card Turning under Camera
• Coding system for contactless microcircuits according to ISO 14443, ISO 18092 (NFC)	Compliant for ID documents based on ICAO Please refer to chapter 2.2.9 Chip Encoding Contactless - 1-fold - MB 1301 Standard. Interoperability with ISO 18092 is ensured via ISO 14443.
• Data transfer rate: up to 424 kbit/sec	Compliant Please refer to 2.2.9 Chip Encoding Contactless - 1-fold - MB 1301 Standard
• Production capacity: minimum 100 cards per hour.	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
• The data format regarding the personalization and reporting works will be in XML format (min. UTF-8 (mandatory), Unicode (optional)).	Compliant Please refer to chapter 2.6 MCES - Mühlbauer Personalization Platform
• Power supply: 230VAC± 10%, protection min. 10A, frequency 50/60 Hz	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
• Noise level: maximum 70 dB(A)	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version

III. Technical requirements for the Laser system:	
• Fiber laser with a minimum power of 20W	Compliant Please refer to chapter 2.3.6 Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP)
• Impulse width and/or power: adjustable	Compliant Please refer to chapter 2.3.6 Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP)
• Resolution: minimum 600 dpi	Compliant Please refer to chapter 2.3.6 Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP)
• Cooling: air - air	Compliant Please refer to chapter 2.3.6 Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP)
• Lifetime: min. 60,000 hours of operation	Compliant Please refer to chapter 2.3.6 Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP)
• Compliance with environmental conditions: room temperature min. 15 °C to 30 °C; humidity: min. 40% to a maximum of 60%.	Compliant But please refer to the recommended environment conditions to achieve best personalization quality results. See chapter 2.3.6 Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP)
IV. Included amenities:	
1. <u>Mandatory - Table (work desk) support for each specialized equipment for personalizing polycarbonate cards, according to the manufacturer's recommendations including:</u> • Work desk with integrated slots for cable management, • Free access to the shelves (drawers) arranged laterally, • Integrated strip of multiple sockets (the number of sockets must correspond to the total number of equipment placed on the table + min. 1 spare) for power supply with power surge protection, • Mounted on castors with locking brakes.	Compliant Please refer to chapter 2.9 Machine Table
2. Optional: Integrated indicator (traffic light) - 3 colors to display the operating status of the personalization equipment: 1) Green - Correct operation; 2) Yellow – Waiting; 3) Red - Not working/fault/etc.. Placement of the indicator - with mounting on the personalization equipment.	Compliant Please refer to chapter 2.1 Basic SCP 60 NOVUS - Modular Version
V. Commissioning services and support:	
Support services at the Beneficiary's premises and/or remotely (as applicable) for the adjustment and integration of the integrated operating system during the period of equipment preparation for commissioning according to the Beneficiary's requirements, including:	
• adaptation support with the national document production system at the Buyer's headquarters and remotely (if applicable) at the equipment commissioning stage;	Compliant Please refer to chapter 3.1.5 Installation and Commissioning at Customer Facility
• supply a spare parts kit, including tools and spare parts, to enable the Buyer's technical team to perform level 1 and 2 interventions for replacing any	Compliant Please refer to chapter 3.1.8 Spare Part Packages and Tools

defective items that could disrupt the equipment's operation.	
• training on the operation of new equipment and interventions for the primary remediation of level 1 and level 2 technical deficiencies, as well as the replacement of spare parts and software settings by the technical specialists of the Buyer.	Compliant Please refer to chapter 3.1.7 Training
• providing accompanying documentation: - The technical passport, including the manual(s) for the use and maintenance of the equipment in English; - Technical documentation related to the software product used, including equipment interfaces with examples of integration into the personalization system;	Compliant Please refer to chapters 2.11 Documentation, 2.12.5 Documentation and 3.1.7 Training
• configuration of sample document models and personalization on polycarbonate cards based on data provided by the Buyer (personalized document model on polycarbonate card for each type of document).	Compliant Please refer to chapter 3.1.5 Installation and Commissioning at Customer Facility
• The Bidder shall include in its bid SDK (software development kit), proper integration documentation and support services for integration with a third-party software developer of the customization system contracted by the contracting authority.	Compliant Please refer to chapter 2.12 MCES Software Development Kit
VI. Warranty	
Warranty: min. 36 months (after delivery, commissioning and signing of the act of receiving and handing over the goods). All costs of resolving warranty cases including spare parts are borne by the manufacturer. **For the resolution of warranty cases as well as in the case of receiving technical assistance requests, the following reaction times will be observed:** - *Telephone response time – up to 2 business hours;* *Reaction time for diagnosing the equipment and determining the cause of the malfunction, including remotely (if applicable) - up to 8 working hours;* - *Reaction time for restoring the functionality of the equipment including remotely (if applicable) with the use of spare parts available in stock - up to 5 working days;* - *Reaction time for restoring the functionality of the equipment with the use of spare parts not available in stock - up to 15 working days; except for the time used for customs procedures;* ***Working hours - from 8.00 a.m. to 5.00 p.m., according to the time zone of the Republic of Moldova.*** ***Working days - according to the calendar of the Republic of Moldova.***	Compliant Please refer to chapter 3.2 Maintenance and Support Services for 36 months

The supplier will present a statement that the equipment can be maintained and repaired for a period of at least 10 years with the assurance of the availability of parts during this period.	Please refer to attached documentation in our bid: • #08.1_OEM_Confirmation of Equipment Warranty.pdf and • #08.2_Bidder_Statement of Use.pdf

2 Equipment for personalizing polycarbonate cards

2.1 Basic SCP 60 NOVUS - Modular Version

Picture: SCP 60 NOVUS - modular version in similar configuration

This SCP 60 NOVUS is a new and optimized modular solution for the personalization of smart cards in format ID-1. Optimization of the system dimensions and weight have been performed with this system generation as well. A further benefit is the extension capability with additional personalization processes like inkjet printing or laser engraving.

Every SCP 60 NOVUS will be provided with CE declaration certificate upon delivery.

The cards are fed in into the machine system with the help of an integrated card buffer. From here a single card is guided to the machine`s internal personalization processes. The machinery can be configured with several options to enable a high quality personalization result. After all processes are completed, the personalized document is forwarded to the output of the machine system.

With a throughput of up to 120 uph, SCP 60 NOVUS is an ideal solution for small-range and mid-range personalization. The machine is equipped with the proven personalization platform Mühlbauer MCES and can be integrated into a production and personalization management system such as Mühlbauer INCAPE & PalaMax.

System Operation

Power Supply
- Voltage 230V, ± 10%, protection 10A
- Frequency 50/60 Hz

Sound Level
- max. 70 dB(A)

System Connection
- TCP/IP via Ethernet, LAN (1Gbit)

Operator Interface
- User friendly integrated colored touch screen for system operation
- 10" multi touch monitor, WXGA(1280 x 800 pixels)
- 16.7 million display colors
- Digital input signals via HDMI
- Integrated PC with CPU, RAM and storage medium optimized for machine with OS WIN 10

Signal Light
- LED technology
- Fits perfectly to the innovative machine design
- Smoothly integrated in machine housing for easy machine status observation

Specification of Material
- Card dimension: ID-1 format according to ISO/IEC 7810

- Card material that is suitable and has been released for the specific personalization processes. For example: PC for laser marking and printing applications
  Note:
  Card materials might have limitations and are not suitable for all kind of personalization processes.
- Cards that are free of dust, dirt, scratches and that haven't been handled or touched by silicon parts.
- Cards should not have been contaminated by fingerprints.
- Usage of other materials or customer specific card bodies upon request after test and release.
- Handling of clear card bodies upon request and after test of customer specific material with release, too.

Sample ID card without pre-printed caption

Sample ID card with pre-printed caption

Production Environment Recommendation

- Clean and dust-free card production area during production and downtime
- Stable and continuous environment temperature with favorable working point between 23°C ± 3°C
- Stable and continuous environment humidity with favorable working point between 50% ± 10%
- For high quality production results an atmospheric overpressure inside the production room is recommended
- Removal of exhaust air out of the production room by appropriate building installations and/or facilities

2.2 Process Frame Input - Vision - Chip Coding

2.2.1 Basic Process Frame Input - Vision - Coding

The Process Frame Input - Vision - Coding is the first frame element of Mühlbauer's SCP 60 NOVUS card personalization system. It contains a single card input station from which the cards get separated. As available extension options, these cards can be checked and inspected by a camera system. Depending on the choice, it is also possible to mount the dedicated chip encoding hardware in the process frame. The chip programming system is a multifunctional encoding system for contact or/and contactless chip encoding. The contact based part supports memory and processor modules with T=0 / T=1 protocol. The RFID part is based on 13.56 MHz transponder frequency and the standard protocol types ISO 14443 type A and B. The system is designed to perform the chip encoding via coding DLLs. Specific DLLs can be developed to perform BAC, SAC or EAC. Note: DLLs are not part of the machine itself.

The frame length is 450mm.

2.2.2 Card Input Stacker 1-fold

- Processing of cards in format ID1/CR80 according to ISO/IEC 7810 with a thickness of 0,76mm ± 0,08mm in standard version
- Input stacker capacity approx. 200 cards with card separation from bottom

2.2.3 Camera Inspection Station

The standard configuration is one camera system for card front side inspection.
As an extension option a turning station for card backside inspection is configurable.

Basic Configuration

- High resolution camera for image processing
- Special LED illumination with white and IR (850nm) light
- MB Vision Software

Technical Data of Camera

Type:	6 Megapixels camera
Resolution:	3.088 x 2.076 pixels - approx. 32 µm/pixel
Accuracy:	+/- 0.1 mm

General Technical Demands

- **OCV** (**O**ptical **C**haracter **V**erification)
  The goal of OCV is to verify the current printing / engraving in order to prevent data mismatch; OCV requires a non-proportional font (e.g. OCR-B), a font height > 1,70 mm and a character line width > 0,20 mm. Background of text must be homogenous with good contrast to foreground.

- **OCR** (**O**ptical **C**haracter **R**ecognition)
  The goal of OCR is to recognize a character sequence (e.g. serial number) in order to prevent data mismatch or for Data matching; OCR requires a non-proportional font (e.g. OCR-B), a font height > 2,50 mm and a character line width > 0,20 mm. Background of text must be homogenous with good contrast to foreground.
- **Barcode**
  Linear barcode inspection requires a minimum line width and distance of the bars at about 0,20 mm.
  Feasibility of smaller bars or other barcode types must be checked by Mühlbauer vision department.

Throughput

- The throughput of the Vision Station mainly depends on the inspection process
- Particular details about throughput after clarification of all technical details and tests with customer material and data

Note:
The card verification function is a tool to optimize the QA process chain. It does not replace the general quality control processes of the production including manual quality assurance. The tool is an addition to the general QA process chain

2.2.4 Extension - Turning under Camera

Extension of the standard station for card front & rear side inspection by a card turning unit.

2.2.5 Inspection Package - Standard Card Input

With the standard card input inspection package, the application software provides the following basis features:

- Image capturing of card under vision unit
  Comparison of image with taught reference image
- PrePrint Correction by shifting of PrePrinted text header
  Calculation and transfer of X-Y-position and rotation value to following printing or engraving system for optical personalization

2.2.6 Inspection Package - Standard Data Handover

With this standardized inspection package OCR Data Handover, the data already on the card can be readout, data for one ore more other work stations can be generated, for example a printed card serial number can be read and afterwards it can be added to the database and if necessary, to be personalized by chip encoding.

A data handover can be done with following data types:

- Barcode data (1D or 2D code)
- Text or numerical data

With further reading units (optional), additional card data can be read and used for supplementary document processing. Such units could be:

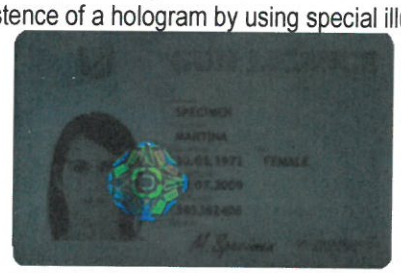
- Magnetic stripe data
- Chip data (contact and contactless)

2.2.7 Inspection Package - Extension - CLI / MLI Detection

This extension package checks the existence of a CLI/MLI feature by using a special illumination. Further it is able to provide a position correction, in case laser marking is done inside the feature. CLI/MLI feature must be high in contrast related to card surface.

2.2.8 Inspection Package - Extension - Hologram Check

This extension package checks the existence of a hologram by using special illuminations.



2.2.9 Chip Encoding Contactless - 1-fold - MB 1301 Standard

- Mühlbauer contactless chip encoding hardware, integrated and secured in the encoding station
- Multifunctional encoding system for contactless chip encoding for 13,56 MHz transponder
- Supplied transponder (protocols)
  - According ISO 14443 type A and B
  - According ISO15693, Mifare, Mifare+
  - Transfer rate up to 424 kBit/s
- 1 encoding unit

2.3 Process Frame Laser Engraving - Patch Applying

2.3.1 Basic Process Frame Laser Engraving - Patch Applying

The Process Frame Laser Engraving - Patch Applying is an extension frame element of Mühlbauer's SCP 60 NOVUS card personalization system. It can be equipped with vision inspection system for a precise marking according to the cards' preprint, one laser processing station and a patch applying unit for card surface protection.

In case of color picture personalization by ALFRESCO technology, the laser engraving is part of the personalization process chain in principle.

The possible engraving area is the entire card surface with the exception of a 1 mm large margin on the card long side and the laser process is performed in a shielded laser box to avoid any injuries (Laser Safety Class 1).

For secure production, a standard exhaust system using active carbon filter is integrated in the process frame.

Special extension options that can be chosen are card swivel unit(s) for CLI or/and MLI card security feature personalization.

The frame length is 500mm.

2.3.2 Print Alignment by Camera

This Vision Inspection System will be used for alignment of the print data for the each individual card by usage of a camera and illumination unit.

Basic Configuration

- High resolution camera for image processing
- Special LED illumination with RGB and IR (850nm) light
- MB Vision Software

Technical Data of Camera

Type:	6 Megapixels camera
Resolution:	3.088 x 2.076 pixels - approx. 32 µm/pixel
Accuracy:	+/- 0.1 mm

2.3.3 Laser Engraving Station

- Single card processing station for optical card personalization by laser engraving

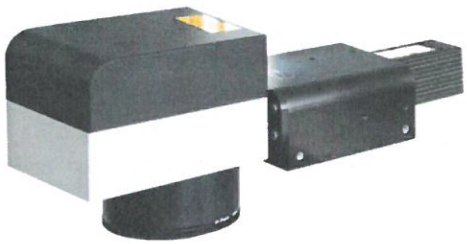
2.3.4 Extension - Turning Station below Laser

- For card front- and backside processing

2.3.5 Extension Laser Swivel Unit X- and Y-Axis (CLI/MLI)

This extension provides the capability to swivel the card along the Y- and X-axis (CLI and MLI feature personalization).

2.3.6 Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP)



Mid-range Performance Greyscale Engraving System

Characteristics	
Type	Fiber Laser
Medium	Ytterbium
Wavelength	~ 1.064 nm
Output Power	20 W
Pulse Width	Adjustable
Resolution	300 - 1.200 dpi
Cooling	Air – Air
Expected Lifetime of Laser Light Source	> 75,000 operating hours
Applications	ID documents (National ID, Driver´s License, Health, Passport,...), Banking (Debit, Credit); GSM Application

Suitable Materials	PC, PVC, PET, ABS, aluminum, stainless steel, other materials available upon request
Markings	Text data (TTF fonts), vector-, rastergraphics (pictures, signatures); Common 1D and 2D barcodes (incl. PDF417 and QR-Codes); Standard laser security features such as clear window, ghost image, tactile elements; Extended security features like CLI/MLI*
Graphical Layout Editor	MB layout designer

Note:
The optimum environment temperature for operation with laser marking process is 23°C in order to achieve stable laser power and marking results. An operation outside this temperature can be processed with moderate impact to the laser characteristics (range: 23°C ± 3°C). Therefore temperature changes should not exceed 1°C per hour in order to keep smooth internal temperature control and adjustment by the laser itself.

* Depending on machine type, there is additional mechanical hardware necessary for CLI/MLI engraving.

2.4 Process Frame Quality Check - Output

2.4.1 Basic Process Frame Quality Check - Output

The Process Frame Output is the last frame element of Mühlbauer's SCP 60 NOVUS card personalization system. It contains of a single card output station in which the good personalized cards will be stacked. A separate bin rejects is also present in order to sort these cards out.

As available extension options, these cards can be checked and inspected in terms of correct personalization by a camera system.

The frame length is 300mm.

2.4.2 Camera Inspection Station for QA

The standard configuration is one camera system for card front side inspection.
As an extension option a turning station for card backside inspection is configurable.

Basic Configuration

- High resolution camera for image processing
- Special LED illumination with white and IR (850nm) light
- MB Vision Software

Technical Data of Camera

Type:	6 Megapixels camera
Resolution:	3.088 x 2.076 pixels - approx. 32 µm/pixel
Accuracy:	+/- 0.1 mm

General Technical Demands

- **OCV** (**O**ptical **C**haracter **V**erification)
  The goal of OCV is to verify the current printing / engraving in order to prevent data mismatch; OCV requires a non-proportional font (e.g. OCR-B), a font height > 1,70 mm and a character line width > 0,20 mm. Background of text must be homogeneous with good contrast to foreground.
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- **Barcode**
  Linear barcode inspection requires a minimum line width and distance of the bars at about 0,20 mm.
  Feasibility of smaller bars or other barcode types must be checked by Mühlbauer vision department.

Throughput

- The throughput of the Vision Station mainly depends on the inspection process
- Particulars about throughput after clarification of all technical details and tests with customer material and -data

Note:
The card verification function is a tool to optimize the QA process chain. It does not replace the general quality control processes of the production including manual quality assurance. These are still part according customer and product individual operations and have to remain.

2.4.3 Camera Inspection Station

The standard configuration is one camera system for card front side inspection.
As an extension option a turning station for card backside inspection is configurable.

Basic Configuration

- High resolution camera for image processing
- Special LED illumination with white and IR (850nm) light
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Note:
The card verification function is a tool to optimize the QA process chain. It does not replace the general quality control processes of the production including manual quality assurance. The tool is an addition to the general QA process chain

2.4.4 Extension – Card Turning under Camera

Extension of the standard station for card front & rear side inspection by a card turning unit.

2.4.5 Inspection Package - Standard Card Output

With the standard card output inspection package, the application software provides the following basis features:

- Image capturing of card under vision unit
- Data verification of printed text or numerical data
- X-Y-position measurement of printed items and check against limits

2.4.6 Inspection Package - Extension - Photo & Signature Match

The extension package Photo & Signature Match is a special tools with which pictures, especially distinctive human features, can be verified. After pre-scaling of the picture provided by the database, it will be used as basis for a comparison with the picture on the card.

If the result of the comparison exceeds a predefined compliance threshold, Photo & Signature Match accepts the card. If the result falls below the compliance threshold, Photo & Signature Match marks and rejects this card.

The printed picture doesn't have to be partially or completely covered by any visible security features, for example, micro scripture, CLI/MLI, hologram, etc. Security overlays or overlay patches in general can have a certain influence on the result of the comparison.

Supported files

- TIFF
- BMP
- JPG (8 bit grayscale picture)

2.4.7 Card Output Stacker, 1-fold

- Output stacker capacity approx. 200 cards with card stacking from bottom
- Collecting tray for rejected cards with a size of approx. 20 cards, integrated in card output stacker

2.5 Operating System Windows 10

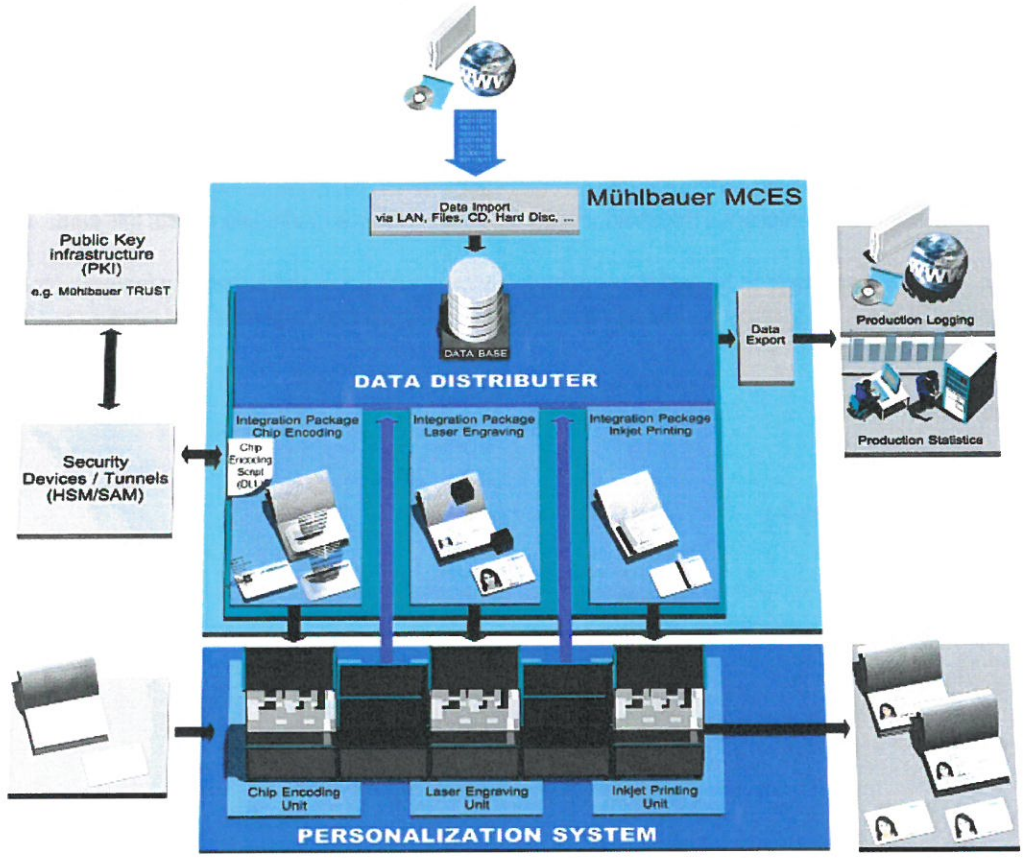
Operating System Windows 10

2.6 MCES - Mühlbauer Personalization Platform

Mühlbauer MCES is deliberately designed to fulfill perfectly the needs of our customers in the management of all card- and job-data for a personalization machine of any kind - from Implanters over Table Top Personalization equipment to high throughput machines.

Thus handling data and personalizing chips in Mühlbauer machines is easy to schedule and good to extend: once learned – used everywhere. Mühlbauer MCES is a powerful and future proof solution.

Mühlbauer MCES - A Modular Universal Personalization Data Manager



Part of the package also is a special interface module that provides an abstract interface to support the implementation of connections to HSMs, SAMs or a document signer for ICAO documents. There will not be delivered any software or hardware with cryptographic functionality.
The data interfaces for accepting data for personalization jobs and reports after finishing are XML based, but can be adapted or created from scratch to any data exchange format required. And new interface programs can even be designed without intervention of Mühlbauer. The internal data management uses a SQL based database.
But this is just one possibility – we are happy to continuously support our clients with our knowledge in all fields of applications.

The offered machines SCP 60 NOVUS are supporting and working with Unicode UTF-16 based multilingual data processing.

Chip-Applications

The flexible approach in Mühlbauer MCES to encode / personalize chips of any kind, contact or contactless, memory or processor, with or without crypto devices, is the use of individually instantiated encoding DLLs per head. This again is open to individual development activities executed either by our clients, or by the professional and experienced engineers and consultants of the Mühlbauer Group.

As a leader in technology, Mühlbauer also provides standard application tools for the leading chip masks and solutions in telecommunications, ID and banking (EMV). For the latter, Mühlbauer also provides data preparation tools to create chip data from standard magstripe data, as used previously for non-chip bank cards.

2.7 MCES Processing Module Chip Contactless

Processing and personalization of individual data stored on contactless memory and processor chips.

- **Supported chip types:**
  - **Memory chips**
    - Mifare Standard
    - Mifare Ultralight
    - Mifare Plus
  - **Processor chips**
    - ISO14443-4 type A
    - ISO14443-4 type B
      ISO 15693
  - **Content**
    - MCES Chip Coding Workstation Software
    - Reader DLL (Interface Software) for Reader Hardware provided by Mühlbauer
    - Basic ATS/UID Chip Test DLL
    - Chip Coding Dummy DLL for Simulation and Testing
    - Reader Tools for setup and maintenance
  - **Not included:**
    - Customized Chip Coding Development
    - Chip Coding Application (DLL) is not part of this module. It can be offered separately or developed by the customer themselves with the MCES Software Development Kit.

2.8 Standard Operator Access & Security Control

- Standard operator access & security control of the system via password

2.9 Machine Table

Industrial machine countertop table, ideal suited for Mühlbauer desktop personalization systems, for efficient production and material handling. The table has a suitable height for an adequate working situation.

Through the shelves in different sizes, it's possible to store a large amount of diverse supplies.

The rollers enable to move the table easily to every free location and set it through the breaks on each roller.

An integrated multiple outlet strip for the electrical power supply leads the cables to power outlets, located on the left side of the table. Thus long cable distances are avoided.

Due to the stable materials the table also can carry heavy weight, like this of a machine.

- Work desk with integrated slots for cable management
- Free access to shelves arranged sideways
  - 3 medium shelves on the left side
  - 1 large shelf on the right side
  - 3 compartments, lockable by key
- Integrated multiple outlet strip for electrical power supply with surge protection
- Mounted on rollers with locking brakes
- Dimensions
  - Height: 835 mm
  - Width: 2400 mm
  - Depth: 800 mm

2.10 UPS - Uninterrupted Power Supply for Complete Machine

The integration of an UPS System is used to protect the personalization system and the integrated PCs respectively from interruption of the power supply. This version includes the necessary hardware and software for the UPS System to communicate with.

If there is a breakdown or a reduction of power supply under the tolerance value, the UPS is able to recognize the event. In addition, the system reports this to the several programs, which save the data. A controlled shut down will then follow.

The basic UPS System is able to supply the complete machine with its integrated PCs with power for a time period necessary to process the secured shut sown.

Procedure at breakdown
When the interruption of the electrical power supply is detected, the system stops the separation of new cards and finishes the personalization of the cards that are already in the production process.
Having finished these cards, the machine with its PCs will then be shut down with the necessary logging.

2.11 Documentation

Operating instructions in English language will be provided.

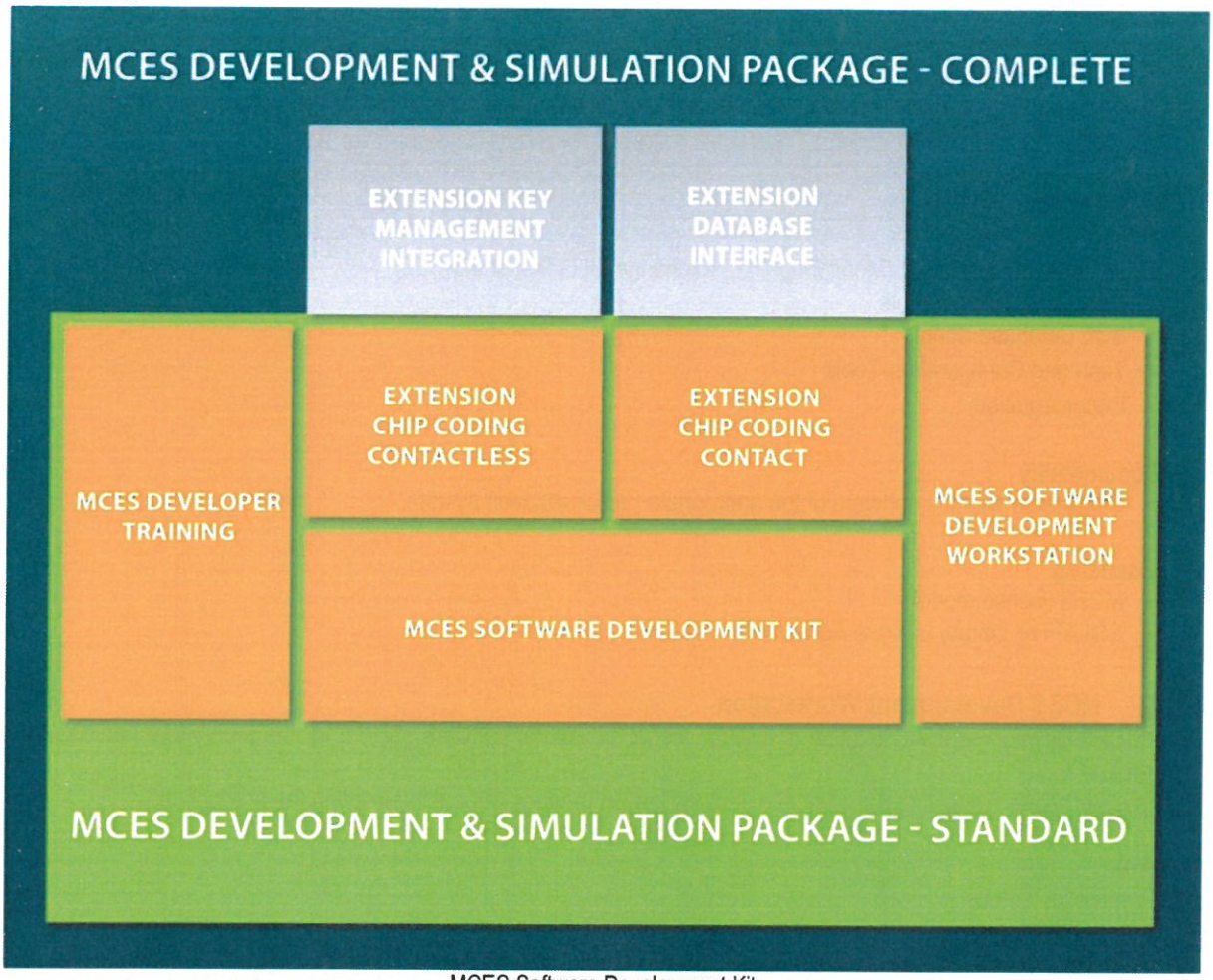
- If the machine is intended for an EU member state, operating instructions in the national language (other than English or German) are available on request, in accordance with the Directive 2006/42/EC on machinery.

The operating instructions contain information about:

- Safety
- Operation
- Service

2.12 MCES Software Development Kit

Overview



MCES Software Development Kit

2.12.1 MCES Software Development Kit

The MCES Software Development Kit is a software package which provides the tools and libraries for an easy and independent development of MCES basic software components for the Mühlbauer personalization system.

Workstation applications and interface extensions, like Monitoring-DLLs, Exchange-DLLs, DataMatching-DLLs and Reporting-DLLs as well as XML-Jobs can be created, enhanced and tested.

Features

- Independent development
  - Workstation applications
  - Interface extensions
    (Monitoring DLLs, Exchange-DLLs, DataMatching-DLLs, Reporting DLLs)
- Instant reaction to system and requirements changes
- Easy debugging and testing

Specification

- **Requirements**
  - Level of knowledge
    - Microsoft Windows 7®
    - Software Developer: VisualStudio, C/C++, C#, object oriented design
    - Extensible Markup Language (XML)/Extensible Stylesheet Language (XSL)

- Relational database, Structured Query Language (SQL)
- Hardware
  - PC / Notebook with Microsoft Windows 7® or higher
- Software
  - Microsoft Visual Studio 2010® or higher
  - SQL based Database

- **Deliverables - Software**
  - MCES Core Library
  - MCES Reporting Library
  - MCES Templates
    - MCES Plugin DLL (Monitoring-DLL, Exchange-DLL, Reporting-DLL)
  - Database Library Scripts
  - SQL Database Scripts
  - Test- und Configuration-Tools
  - Documentation

- **Compatibility**
  - Compatible with the software of the appropriate personalization system

- **Licensing**
  - MCES license model
  - SQLAPI++ Library License Agreement

2.12.2 MCES Development Workstation

The MCES-Development Workstation is fully-functional simulation software system for the Mühlbauer personalization systems.
The system allows simulating the complete personalization process without interrupting the production.

Features

- Prepare job setups
- Create layout files
- Run test procedures offline without affecting production
- Simulate interfaces to production management software
- Validating updates and upgrades
- Installation according to existing or future personalization systems
- New personalization systems capable to be integrated

Specifications

- **Requirements**
  - Level of knowledge:
    - Windows Operating System (Microsoft Windows®)
    - VisualStudio, C/C++, C#, object oriented design
    - Extensible Markup Language (XML)/Extensible Stylesheet Language
    - Relational database, Structured Query Language (SQL)

- **Deliverables - Hardware**
  - System-PC:
    - Notebook - Intel® chipset (default)

    or
    - Desktop PC - Intel® chipset (on request)
    - Drivers and Documentation

- **Deliverables - Software**
  - **Operating System:** Windows 10® or Mirosoft Windows 7®
  - **SQL Server:** SQL based Database

- **Development Environment:** Microsoft Visual Studio®
- MCES Simulation Framework:
  - Mühlbauer Graphical User Interface
  - Master System application
  - Workstation-Simulator applications
  - MCES Database (ArchiveSCP1)
  - XMLDataAcquisition application
  - MCES Tools
  - Customer-related software and files (software developed for the customer)
- MCES Documentation

- **Compatibility**

  - Compatible with the software of the appropriate personalization system

- **Licensing**
  - MCES license model
  - Microsoft ® Licenses

2.12.3 Extension Chip Coding MB1301 (TCP/IP)

The Extension Chip Coding MB1301 is an extension package for the MCES Software Development Kit. It provides the software and hardware for an easy and independent development of Chip-Coding-DLLs for encoding of contact and contact less interfaced SmartCards with the MCES personalization system.

Features
- Independent development
  - Chip Coding Extension Modules (DLLs) for contact and contact less interfaced SmartCards
- Instant reaction to system and requirements changes
- Easy debugging and testing
- SmartCard Reader Selection

Specification
- **Requirements**
  - MCES Software Development Kit
  - Level of knowledge
    - Windows Operating System (Microsoft Windows®)
    - VisualStudio, C/C++, C#, object oriented design
    - Extensible Markup Language (XML)/Extensible Stylesheet Language (XSL)
    - Relational database, Structured Query Language (SQL)
    - Smartcard / Chip Coding Knowledge
    - Cryptographic Basics

- **Hardware**
  - SmartCard Reader contact:
    - MB1301 Chip Coding Contact and Contact less Reader (TCP/IP)

Picture: Reader System Sample Configuration

- **Software**

- MCES Templates
  - Chip-Coding-DLL
  - Reader-DLL
- Test- and Configuration Tools
- Documentation

- **Compatibility**
  - Compatible with the software of the appropriate personalization system

- **Licensing**
  - MCES license model

2.12.4 MCES Developer Training

The MCES Developer Training is the ideal start into the independent development of Mühlbauer MCES software components. It is also the best opportunity to fresh up the knowledge of the latest software features the system is providing.

Features

- Experienced trainers
- Detailed insight into MCES software components and workflows
- Builds the knowledge to do independent developments
- Customizable schedule and training programs
- In factory (at Mühlbauer) or in-house (at customer - price is excl. Travel Expenses)
- Possibility to perform the training online using remote connection, video conference or other communication means
- Up to 5 participants per training
- Startup with your development during the training

Specification

- **Requirements**
  - Up to 5 participants per training
  - Level of knowledge:
    - Microsoft Windows ®
    - Software Developer: VisualStudio, C/C++, C#, object oriented design

- **Content**
  - MCES Overview
  - MCES XML Job and Database
  - MCES Data- and Processing-Workflow
  - Depending on customer needs optional in-depth discussion of:
    - Development of Monitoring-DLL
    - Development of Exchange-DLL / DataMatching-DLL
    - Development of Reporting-DLL
    - Development of Chip-Coding-DLL
    - Development of Data Acquisition Application

2.12.5 Documentation

A User Manual will be provided in English language.

2.13 Deliverables

Position	Short Description of proposed configuration	Units	Comment
1	**SCP 60 NOVUS** • Basic SCP 60 NOVUS - Modular Version • Process Frame Input - Vision - Chip Coding o Basic Process Frame Input - Vision - Coding o Card Input Stacker 1-fold1 o Camera Inspection Station o Extension - Turning under Camera o Inspection Package - Standard Card Input o Inspection Package - Standard Data Handover o Inspection Package - Extension - CLI / MLI Detection o Inspection Package - Extension - Hologram Check o Chip Encoding Contactless - 1-fold - MB 1301 Standard • Process Frame Laser Engraving - Patch Applying o Basic Process Frame Laser Engraving - Patch Applying o Print Alignment by Camera o Laser Engraving Station o Extension - Turning Station below Laser o Extension Laser Swivel Unit X- and Y-Axis (CLI/MLI) o Greyscale Laser 20 W (Mühlbauer - Type LES 20 FP) • Process Frame Quality Check - Output o Basic Process Frame Quality Check - Output o Camera Inspection Station for QA o Camera Inspection Station o Extension – Card Turning under Camera o Inspection Package - Standard Card Output o Inspection Package - Extension - Photo & Signature Match o Card Output Stacker, 1-fold • Operating System Windows 10 • MCES - Mühlbauer Personalization Platform • MCES Processing Module Chip Contactless • Standard Operator Access & Security Control • Machine Table • UPS - Uninterrupted Power Supply for Complete Machine • Documentation	5	
2	**MCES Software Development Kit** • MCES Software Development Kit • MCES Development Workstation • Extension Chip Coding MB1301 (TCP/IP) • MCES Developer Training • Documentation	1	

3 Services

Service nowadays is much more than just repair: With more and more complex production processes, services have to be comprehensive and support each phase of a product life cycle.
With Mühlbauer's scalable service, we can offer the customer an individualized service concept from a single source that meets individual requirements and satisfies the growing demands of today's production.

3.1 Implementation Services

The implementation phase includes all required activities to realize the project according to the agreed scope of supply. As the most important part of the Implementation Services, the Commissioning is done within this phase to assure that all Systems and Equipment are designed, installed, tested and operated according to the customer requirements.

3.1.1 Project Initiation

A delegation from Mühlbauer is meeting with the customer for a Kick-Off meeting, to clarify (among others) the following topics (but not limited to):

- Main Project goals / scope of work / deliverables / expected outcomes
- Project team (Mühlbauer and customer)
- Aspects of communication and integration interfaces for personalization equipment
- Project schedule and milestones
- Delivery and acceptance

Position	Short Description of proposed configuration	Units	Comment
1	**Project kickoff meeting in Moldova:** • 1x Project Manager • 1x Product Architect • 1 day in Moldova (8 hours per day)	1	

3.1.2 Pre-Commissioning at Mühlbauer Facility

Pre-Commissioning activities ensure the readiness of the Equipment prior to the installation, commissioning and future operations.

- Pre installation of the Personalization Machines
  - Printing adjustment to customer specified card layout - configuration of sample document models and personalization on polycarbonate cards based on data provided by the customer for each type of document
  - Adjustment of machine inspection modules to the specified card layout

Testing of 3rd party integrations/interfaces

Position	Short Description of proposed configuration	Units	Comment
1	**Pre-commissioning at Mühlbauer Facility:** • 5x SCP60 Novus	1	

3.1.3 Factory Acceptance Test (FAT)

Before shipment of equipment to its final destination a Factory Acceptance Test shall be performed.
For projects involving new Equipment and Systems, an FAT is performed at Mühlbauer's facility before the solution is shipped to the customer´s site. During the FAT, Mühlbauer tests the Equipment according to customer-approved test plans and specifications to demonstrate that it meets the customer's requirements.

3.1.4 Delivery

After the system is accepted for shipment the components will be packed in a proper way to prevent damages to the items. All technical units will be gathered to boxes in a reasonable way to make the logistical requirements between dispatch and arrival as effective as possible.

Position	Short Description of proposed configuration	Units	Comment
1	**Delivery:** • 5x SCP60 • INCOTERMS 2020 - DAP, 42 A. Pushkin str., Chisinau municipality, Moldova.	1	

3.1.5 Installation and Commissioning at Customer Facility

The Installation and Commissioning of the Equipment is performed by an experienced team of Mühlbauer experts and comprises typically the following activities:

- Unpacking and Positioning of the Equipment to the final production area
- Equipment Installation - the physical installation of the Equipment and the Systems at the customers facility, including the connection to the necessary infrastructure, and 3rd party interfaces
- Commissioning - Equipment and Systems are powered up and tested in a standalone environment.
- Integration into customer environment. Test the Equipment with the procedure that has already been approved and agreed during the Project Initiation.

The main objective of commissioning is to ensure the safe and orderly handover of Systems and Equipment from the manufacturer to the customer and to guarantee its operability in terms of performance, reliability, safety and information traceability.

Position	Short Description of proposed configuration	Units	Comment
1	**Installation and Commissioning at Customer Facility:** • 1x Machine Service Engineer • Installation, integration, and adaptation of 5x SCP60 Novus	1	Implementation schedule according to tender requirements

3.1.6 Site Acceptance Test (SAT)

Once the Equipment are commissioned and their correct operation has been tested and confirmed, the Commissioning process is considered complete and the solution is formally handed over to the customer.
The acceptance of the system will be recorded within a Site Acceptance Protocol, which is signed by the authorized representatives of the customer and Mühlbauer.

Position	Short Description of proposed configuration	Units	Comment
1	**Site Acceptance Test:** • 1x Machine Service Engineer • 2x Days (8 hours per day)	1	

3.1.7 Training

To enable customers' staff responsible for operation and maintenance of the installed personalization machines, Mühlbauer provides the following trainings as a part of the Implementation Services:

3.1.7.1 Operator Training

Operation and daily maintenance training will be given to the operators

Position	Short Description of proposed configuration	Units	Comment
1	**Operation and Daily Maintenance Training** • 1x Machine Service Engineer • 2x Days (8 hours per day) • Done at place of installation • Documentation	1	Implementation schedule according to tender requirements

3.1.7.2 Maintenance Training

Corrective and preventative maintenance tasks are separated by levels of complexity. Mühlbauer offers the customer individualized trainings to successfully complete procedures, diagnostics, and repairs for both types of Maintenance (corrective and preventive)
Maintenance training will be given to customer technical specialists in order to enable to perform necessary corrective interventions in terms of necessity (replacement of parts, adjusting setiings , etc.)

Documentation:

- providing accompanying documentation:
  - The technical passport, including the manual(s) for the use and maintenance of the equipment in English;
  - Technical documentation related to the software product used, including equipment interfaces with examples of integration into the personalization system;
- configuration of sample document models and personalization on polycarbonate cards based on data provided by the Buyer (personalized document model on polycarbonate card for each type of document).

Position	Short Description of proposed configuration	Units	Comment
1	**Maintenance Training** • 1x Machine Service Engineer • 3x Days (8 hours per day) • Done at place of installation • Documentation	1	Implementation schedule according to tender requirements

3.1.8 Spare Part Packages and Tools

Mühlbauer will provide Initial spare part package and tools to enable customer's technical team to perform interventions for replacing defective items.

3.1.9 Deliverables:

Position	Short Description of proposed configuration	Units	Comment
1	**Project kickoff meeting in Moldova:** • 1x Project Manager • 1x Product Architect • 1 day in Moldova (8 hours per day)	1	
2	**Pre-commissioning at Mühlbauer Facility:** • 5x SCP60 Novus	1	
3	**Factory Acceptance Test (FAT)** • 2x days at Mühlbauer's HQ, together with client	1	
4	**Delivery:** • 5x SCP60 • INCOTERMS 2020 - DAP, 42 A. Pushkin str., Chisinau municipality, Moldova.	1	
5	**Installation and Commissioning at Customer Facility:** • 1x Machine Service Engineer • Installation, integration, and adaptation of 5x SCP60 Novus	1	
6	**Site Acceptance Test:** • 1x Machine Service Engineer • 2x days (8 hours per day)	1	
7	**Operation and Daily Maintenance Training** • 1x Machine Service Engineer • 2x days (8 hours per day) • Done at place of installation • Documentation	1	
8	**Maintenance Training** • 1x Machine Service Engineer • 3x days (8 hours per day) • Done at place of installation • Documentation	1	
9	**Spare Part Packages and Tools:** • Spare parts for machines 3% from machine price • Tools	1	

3.2 Maintenance and Support Services for 36 months

The Maintenance and Support Services will start from the date of acceptance of personalization machines and will last for 36 months.

3.2.1 Service Support Levels

When it comes to Incident Management Mühlbauer handles the incidents using the following support levels sequentially:

- Mühlbauer 1st Level Support: Technical Support Group (TSG)
- Mühlbauer 2nd Level Support Specialist Support Group (SSG)
- Mühlbauer 3rd Level Support Research and Development (R&D)
- Mühlbauer Field Service Support (Global Service Network)

Mühlbauer 1st Level Support: Technical Support Group (TSG)

If customer's the on-site support efforts could not solve the incident, it is escalated to the Mühlbauer 1st Level Support team, the Technical Support Group (TSG). Embedded in the Mühlbauer Central Service Organization, the TSG takes care of the internal coordination for further support. The 1st Level Support is provided remote via phone and email.

Mühlbauer 2nd Level Support Specialist Support Group (SSG)

If the 1st Level Support efforts could not solve the incident, it is escalated to the Mühlbauer 2nd Level Support team, the Specialist Support Group (SSG), The Central Service Organization takes care of the internal coordination for further support. The relevant internal departments are involved in order to provide clarification to the inquirer via phone / email or remote desktop support.

Mühlbauer 3rd Level Support Research and Development (R&D)

If the 2nd Level Support efforts could not solve the incident, it is escalated to the Mühlbauer 3rd Level Support provided by the Software Development and / or R&D teams. The relevant internal departments are involved in order to provide clarification to the inquirer via phone / email or remote desktop support.

Mühlbauer Field Service Support (Global Service Network)

The Mühlbauer Field Service is a global network. Qualified and committed engineers on all continents provide the necessary proximity to Mühlbauer customers and ensure shortest lead times.

Corrective Maintenance tasks for incidents which couldn't be resolved by the means of the central support levels are forwarded to the Field Service network. Depending on the nature of the incident, dedicated specialist are then dispatched in close consultation with the customer.

Position	Short Description of proposed configuration	Units	Comment
1	**Service Support:** • 1st , 2nd & 3rd Level Support (remote) • Field Service Support (when applicable)	1	For 36 months from date of acceptance of system

3.2.2 Reaction times

Following reaction times are offered for warranty cases and as well as for any further technical inquiries:

- Telephone response time – up to 2 business hours; Reaction time for diagnosing the equipment and determining the cause of the malfunction, including remotely (if applicable) - up to 8 working hours;
- Reaction time for restoring the functionality of the equipment including remotely (if applicable) with the use of spare parts available in stock - up to 5 working days;
- Reaction time for restoring the functionality of the equipment with the use of spare parts not available in stock - up to 15 working days; except for the time used for customs procedures;

Working hours - from 8.00 a.m. to 5.00 p.m., according to the time zone of the Republic of Moldova. Working days - according to the calendar of the Republic of Moldova.

Position	Short Description of proposed configuration	Units	Comment
1	**Reaction times:** • Reaction times as specified	1	For 36 months from date of acceptance of system

3.2.3 Mühlbauer ServiceDesk Platform

The main purpose of the ServiceDesk Platform is to establish an effective communication interface between Mühlbauer and its customers' users. The Mühlbauer ServiceDesk Platform is a single point of contact issue tracking system used to record, respond to and archive incidents and other service requests transmitted by phone or e-mail. The ServiceDesk Platform provides centralized access to the system via a web interface that can be used by both agents and customers. Users can be registered on the platform and linked to their company. Each user can create and manage their own incident reports and service requests via the web interface at any time - 24/7. The Mühlbauer ServiceDesk Platform receives real-time information about the ticket status and its progress. With already integrated and well-structured incident reports, the Mühlbauer support team can immediately start the support process.
Within the ServiceDesk Platform a reporting function and a tracking of incidents including the creation of weekly/monthly reports is included for incidents that have occurred in relation to the Systems and Equipment.

Position	Short Description of proposed configuration	Units	Comment
1	**ServiceDesk:** • ServiceDesk availability for 5x SCP60	1	For 36 months from date of acceptance of system

3.2.4 Preventive Maintenance

Preventive Maintenance aims to maintain Equipment and keep it in the best possible operating condition. Preventive Maintenance is performed by qualified personnel.
Preventive Maintenance allows the customer's Equipment to run much more efficiently. In turn, the company benefits from having Equipment and Systems running at peak performance and increasing the mean time between failures.
Preventive Maintenance includes the following tasks:

- Early detection of damage and wear, minimizing the risk of unplanned Equipment downtime
- Exchange of information between engineers
- General check of Equipment's software and hardware
- Sensor and actuator tests including adjustment, if necessary
- Inspection of all moving parts, pin joints, guides, etc. including adjustment, if required
- Check of process stations, such as coding / laser / vision
- Check for early detection of defects, replacement of wear parts, minor repairs

Position	Short Description of proposed configuration	Units	Comment
1	**Preventive Maintenance:** • Once per year during 36 months • 1x Machine Service Engineer • 5 days (8 hours per day)	1	

3.2.5 Warranty

Mühlbauer provides 36 months warranty for offered equipment (After signing site acceptance act). All costs of resolving warranty cases for offered equipment including spare parts covered.

Position	Short Description of proposed configuration	Units	Comment
1	**Warranty:** • For 5x SCP60	1	For 36 months from date of acceptance of system

3.2.6 Deliverables:

Position	Short Description of proposed configuration	Units	Comment
1	**Service Support:** • 1st , 2nd & 3rd Level Support (remote) • Field Service Support (when applicable)	1	
2	**Reaction times:** • Reaction times as specified	1	
3	**ServiceDesk:** • ServiceDesk availability for 5x SCP60	1	
4	**Preventive Maintenance:** • Once per year during 36 months • 1x Machine Service Engineer • 5 days (8 hours per day)	1	
5	**Warranty:** • For 5x SCP60	1	

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