

CONFIDENTIAL



**Specialized equipment for personalizing
passports/travel documents with polycarbonate data
page**

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For the Public Services Agency (PSA)

Procedure electronic auction – 3 rounds.

TECHNICAL PROPOSAL

by

SUPPLIER

IAI industrial systems B.V.

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1. Introduction

This technical proposal fully complies with the qualification requirements, as well as the requirements provided for in the specifications of the referred tender process. The Technical Specifications Annex no. 22 is provided as a separate document.

The ESPD/DUAE and Bid Security are also part of this tender response, provided as separate documents.

All the information is following Annex no. 1 to the Order of the Minister of Finance no. 115 as of 15.09.2021, Annex no. 2 to the Standard Documentation approved by the Order of the Minister of Finance no. 115 as of 15.09.2021, and Annex 1.1 to the Procurement Notice Technical requirements for the specialized equipment (system) for personalizing passports/travel documents with polycarbonate data page. All requested/mandatory documents from Annex no. 2 Item17 are provided independently.

IAI industrial systems B.V., later referred to as Supplier, as an OEM of Passport Personalization Machines, has been at the forefront of secure document personalisation for more than 25 years, providing unique and advanced systems for governmental document issuance. With extensive knowledge and proven performance, we have gained an excellent reputation for the design and supply of personalisation systems where laser and inkjet technologies together, with precision mechanics and control software, play key roles.

Over 40 countries use Supplier solutions to personalise and secure their documents.

Whether we work for a government agency or printing house, Supplier strives to produce the most secure documents possible. Many governments, enterprises, and innovative technology experts work closely with us to develop effective new security measures and Systems that lock out counterfeiters in every corner of the world.

Contracting authorities and partners entrust Supplier with their most challenging projects because they know we are knowledgeable, accountable, reliable, and able to deliver results. However, that is just the start. As one of the world's most successful pioneers in laser and inkjet technologies, we help you take the next step to the future. We have built our reputation on developing unique industrial applications and solutions that meet your expectations.

In case we are the preferred contractor, we would be happy to discuss and close an agreement based on Annex no. 24 to Standard Documentation approved by Order of the Minister of Finance no. 115 of 15.09.2021.



2. Glossary of Terms

Term used	Meaning
Supplier	IAI industrial systems B.V
Contracting authority/Buyer	Public Services Agency (PSA)
BMPro	Passport Personalization Printer BookMaster® Pro System.
System(s)	BMPro
Document	Passport/booklet
Unit	Part of the BMPro, a modular System.
Host	Contracting authority-System providing the personalization data
Personalization	Applying the personalized information to the card
FAT	Factory Acceptance Test: test at Supplier to validate the quality of the System before shipping
SAT	Site Acceptance Test: test at Contracting authority site to validate the quality of the System before starting production
IRS	Installation requirement System for BMPro
Simulator	SDK (software development kit)- simulator software to facilitate the integration
Supplier Host Interface	Well-defined Open Host interface to integrate Contracting authority-System providing the personalization data
Supplier Chip encoding Interface	Chip encoding interface to integrate third-party software developer
NA	Not applicable



3. System specifications and regulatory compliance to Annex 1.1.

Technical requirements for the specialized equipment (System) for personalizing passports/travel documents with polycarbonate data page		SUPPLIER compliance
Equipment and accessories – non-refurbished, produced after 01.01.2025. All requirements are minimum and mandatory.		Compliant All equipment and accessories are produced after 01.01.2025 and are non-refurbished.
Field of use: Personalization of passports, ID-3 format, having a polycarbonate data page (page 2) using laser engraving technology, applies a full color print on the observation paper page (page 3) using inkjet printing technology, enables the encoding of personal data into the integrated contactless chip and integral inspection of the personalized passports.		Compliant The BookMaster® Pro System, further referred to as System(s), is an automated System that personalizes passports having a polycarbonate data page (page 2) using laser engraving technology. Applies Standard laser security features applies a full colour print on the observation page (page 3) using inkjet printing technology, enables the encoding of personal data into the integrated contactless chip and performs an integral inspection of the personalized passport.
General technical requirements for the specialized equipment (System) for personalizing passports/travel documents with polycarbonate data page:		
I. The main components of the specialized equipment (System):		
1.	Built-in computer with hard disk, licensed operating System on which software from the manufacturer will run for operating the personalizing System and the integrated equipment	
1.1	Integrated digital control panel (touchscreen) min.8"(inch);	Compliant The built-in computer of BMPPro is controlled by a Integrated digital control panel (touchscreen). This touchscreen is of minimum 8"(inches). Refer to Section 4.1
1.2	TCP/IP System connection via Ethernet, LAN (1Gbit);	Compliant The specifications for the TCP/IP System connection via Ethernet, LAN (1Gbit) are confirmed. This setup ensures high-speed data transmission and reliable network connectivity, suitable for various professional applications.



			Refer to Section 4.3
	1.3	Licensed operating System: min. Windows 10;	Compliant The Systems have the latest supported manufacture licensed operating system, which is minimum Windows 10. This ensures compatibility with the latest software and security updates, providing a stable and secure environment for professional use. Refer to Section 4.4
	1.4	External connectivity: min. HDMI, USB (optional)	Compliant The Systems have external connectivity options, including a minimum of HDMI and optional USB. This ensures compatibility with various external devices and peripherals, providing versatility for different applications. Refer to Section 4.4
	1.5	The parameters of the computer (computing unit) CPU/RAM/Storage must correspond, and have sufficient redundancy, to the minimum cumulative operating requirements of the Windows operating System and the integrated software System set by the manufacturer.	Compliant The computing unit of the BMPPro meets the minimum cumulative operating requirements set by the manufacturer for running Windows and the integrated software Systems. Refer to Section 4.3
2.	Input unit: with capacity of hold minimum 30 pre-opened booklets (34 pages passport).		Compliant The Input unit of BMPPro is designed to hold a minimum of 30 pre-opened booklets, each consisting of 34 pages (passport format). This capacity ensures that the unit meets the required specifications for efficient operation and handling of the booklets. Refer to Section 4.1.1
3.	Identification unit: for reading a barcode printed on a label located at the outside back cover of the booklet or pre-programmed number from the chip.		Compliant The Identification unit of BMPPro is capable of reading a barcode printed on a label located at the outside back cover of the booklet. Additionally, it can read a pre-programmed number from the chip embedded within



		the booklet. This requires a Chip encoding unit. This dual functionality ensures that the System meets the required specifications for accurate and efficient identification. Refer to Section 4.1.2
4.	<p>Chip encoding unit: with programming heads for contactless chip encoding.</p> <p>NOTE</p> <p>* <i>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.</i></p> <p>** <i>Regardless of who is the manufacturer of the chip encoding component used in the specialized equipment delivered for the personalization of passports, 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-3) through this equipment.</i></p>	<p>Compliant</p> <p>The Chip encoding unit of BMPPro can be equipped with one or two encoding unit(s) for contactless chip encoding.</p> <p>Refer to Section 4.1.2</p>
5.	<p>Laser engraving unit: for applying photograph, personal data and MRZ onto the polycarbonate data page (page 2 of the passport). This unit should contain a fiber laser, which can automatically apply the MLI security feature.</p> <p>NOTE</p> <p>* <i>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.</i></p> <p>** <i>Regardless of who is the manufacturer of the laser engraving components used in the specialized equipment supplied for the personalization of passport, 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-3) through this equipment.</i></p>	<p>Compliant</p> <p>The Laser engraving unit provided is designed for applying photographs, personal data, and Machine-Readable Zone (MRZ) data onto the polycarbonate data page (page 2 of the passport). This unit contains one (1) fiber laser (30 Watt) and can automatically apply the Multiple Laser Image (MLI) security feature.</p> <p>Refer to Section 4.1.3</p>
6.	<p>Inkjet printing unit: for applying the photograph and personal data onto the observation page (page 3) of the passport. This unit should contain a DoD Inkjet industrial printer, using inks CMYK and UV to print on the observation page (page 3) in full color and full color UV or monochrome UV.</p>	<p>Compliant</p> <p>The Inkjet printing of BMPPro is designed for applying the photograph and personal data onto the observation page (page 3 of the passport). This unit contains a Drop-on-Demand (DoD) inkjet printer with</p>

		industrial piezo electric printing heads, using inks CMYK and UV to print on the observation page (page 3) in full colour and monochrome UV or full color UV. Refer to Section 4.1.4
7.	Verification of the applied data: The System should ensure the quality control and assurance of personalization by verification of the personalized data.	Compliant The System ensures integrity check and assurance of personalization through the verification of personalized data. Refer to Section 4.1.5
8.	Output unit: with capacity of hold minimum 30 pre-opened booklets (34 pages passport).	Compliant The output unit of BMPPro is designed to hold a minimum of 30 pre-opened booklets, each consisting of 34 pages. This ensures efficient handling and storage of the booklets during the personalization process, maintaining the integrity and organization of the passports. Refer to Section 4.1.1
II. Functional technical requirements of personalization equipment:		
<ul style="list-style-type: none"> Automated passport personalization System with a polycarbonate data page using laser engraving technology, full color printing of the observation page using inkjet printing technology, encoding of personal data in integrated contactless chip and full inspection of the personalized passport. 		Compliant The BMPPro is an industrial, automatic System designed for mid-volume personalization of passports. It supports the personalization of passports with polycarbonate data pages, ensuring high reliability and quality. The System utilizes laser engraving technology for the polycarbonate data page and inkjet printing technology for full-color printing of the observation page. Additionally, it encodes personal data into an integrated contactless chip and performs a integrity check of the personalized passport to ensure accuracy and quality. Refer to Section 4
<ul style="list-style-type: none"> Personalization of ID-3 format passports with polycarbonate data pages (ICAO 9303 compliant): Width: 88±0.75 mm, Height 125±0.75 mm. according to ISO/IEC 7810. 		Compliant The BMPPro is designed to personalize ID-3 format passports with polycarbonate data pages that are compliant



	with ICAO 9303 standards. This ensures that the personalized passports meet international standards for size and quality. Refer to Section 4.4
· Markup of textual data (TTF fonts), vector, raster graphics (images, signatures), as well as one- and two dimensional barcodes (including QR codes).	Compliant The BMPPro supports the markup of textual data using TTF fonts, ensuring clear and readable text. It accommodates vector and raster graphics, including images and signatures, to provide high-quality visual elements. The offered personalization equipment supports the personalization of various types of one-dimensional and two-dimensional barcodes, including PDF417 and QR codes. Refer to Section 4.1.3
· Ensure the precise engrave alignment for the data page (page 2) and the precise print alignment for the observation page (page 3).	Compliant The BMPPro ensures precise engrave alignment for the data page (page 2) and precise print alignment for the observation page (page 3). Refer to Section 4.1.3
· Standard laser personalization features such as: transparent window, ghost image, tactile elements; advanced security features such as MLI.	Compliant The BMPPro supports standard laser personalization features such as transparent windows, ghost images, and tactile elements. These features enhance the security and authenticity of the personalized documents. Additionally, the System incorporates advanced security features such as Multiple Laser Image (MLI), which provides an extra layer of protection against counterfeiting and unauthorized alterations. Refer to Section 4.1.3
· Coding System for contactless microcircuits according to ISO 14443.	Compliant The BMPPro utilizes a coding system for contactless microcircuits that complies with ISO 14443 standards. This ensures that the encoding of personal data into the





	<p>integrated contactless chip is performed accurately and securely, adhering to international standards for contactless communication and data transfer. Refer to Section 4.4</p>
<ul style="list-style-type: none">· Data transfer rate: up to 424 kBit/sec.	<p>Compliant The BMPPro supports a data transfer rate of up to 424 kBit/sec, ensuring efficient and rapid communication and data transfer for contactless microcircuits. This high-speed data transfer capability enhances the overall performance and reliability of the System. Refer to Section 4.4</p>
<ul style="list-style-type: none">· Production capacity: minimum 100 passports per hour.	<p>Compliant The BMPPro is capable of producing a minimum of 100 passports per hour based on the defined layout shared by the Buyer during the clarification phase. This high production capacity ensures efficient and timely processing of passports, meeting the demands of mid-volume personalization projects. Refer to Section 4.1</p>
<ul style="list-style-type: none">· The data format regarding the personalization and reporting works will be in XML format (min. UTF-8 (mandatory), Unicode (optional)).	<p>Compliant The data format for personalization and reporting/audit files in BMPPro will be in XML format. The personalized data for the Supplier personalization System is available through a network share. The job files are encoded in XML format with UTF-8 encoding. The personalized data for laser engraving and inkjet printing will meet the specifications of Unicode format. This ensures that the data is structured and encoded in a standardized format, facilitating efficient data processing and interoperability.</p>

	Refer to 6.3 Annex Host interface document
<ul style="list-style-type: none"> Power supply: 230VAC\pm 10%, protection min. 10A, frequency 50/60 Hz. 	<p>Compliant</p> <p>The BMPro requires a power supply of 230VAC\pm 10%, with a minimum protection of 10A and a frequency of 50/60 Hz. This ensures that the System operates reliably and safely within the specified voltage range and frequency, providing adequate protection against electrical faults.</p> <p>Refer to 6.1 Annex Preliminary Installations Requirements specifications (IRS)</p>
<ul style="list-style-type: none"> Noise level: maximum 70 dB(A). 	<p>Compliant</p> <p>The BMPro operates below a noise level of 70 dB(A). This ensures that the System functions within acceptable noise limits, providing a quieter and more comfortable working environment.</p>
III. Technical requirements for the Laser System:	
<ul style="list-style-type: none"> Fiber laser with a minimum power of 20W. 	<p>Compliant</p> <p>The BMPro includes a fiber laser with a minimum power of 20W. This ensures that the laser can perform high-quality engraving and personalization tasks with precision and efficiency.</p> <p>Refer to Section 4.4</p>
<ul style="list-style-type: none"> Impulse width and/or power: adjustable. 	<p>Compliant</p> <p>Refer to Section 4.4</p>
<ul style="list-style-type: none"> Resolution: minimum 600 dpi. 	<p>Compliant</p> <p>We hereby confirm our compliance with the technical requirement for laser Systems (BMPro) of a minimum resolution of 600 dpi.</p> <p>Refer to Section 4.4</p>
<ul style="list-style-type: none"> Cooling: air – air. 	<p>Compliant</p> <p>Fans inside the System (BMPro) use the ambient air to cool the machine, and most of the cooling air exits the machine via the large openings in the covers.</p> <p>Refer to Section 4.4</p>

<ul style="list-style-type: none"> Lifetime: min. 60 000 hours of operation. 	Compliant The lifetime of the laser in each System (BMPro) is of a minimum 60000 hours of operation. Refer to Section 4.4
<ul style="list-style-type: none"> Compliance with environmental conditions: room temperature min. 20 °C to 26 °C; humidity: min. 40% to a maximum of 60%. 	Compliant The BMPro is designed to operate efficiently within a room temperature range of 20 °C to 26 °C and a humidity range of 40% to 60%. This ensures optimal performance and reliability of our equipment under the given environmental parameters. Compliant Refer to 6.1 Annex Preliminary Installations Requirements specifications (IRS)
<u>IV. Technical requirements for the Inkjet Printer System:</u>	
<ul style="list-style-type: none"> Type: Drop on Demand printer (DoD). 	Compliant The BMPro complies with the specified type of Inkjet Printer System: Drop on Demand (DoD) printer. The inkjet heads used in the Inkjet Printer System are industrial piezoelectric drop-on-demand inkjet heads, which are known for their long lifetime. Additionally, the inks used in our Inkjet Unit are UV curable inks, ensuring durability and high-quality printing results. Refer to Section 4.1.4
<ul style="list-style-type: none"> Resolution: minimum 600 dpi. 	Compliant We confirm a minimum 600 dpi resolution. Refer to Section 4.1.4
<ul style="list-style-type: none"> Number of colors: 4 (yellow, magenta, cyan, black) and support of full color UV or monochrome UV printing. 	Compliant The Inkjet Printer System complies with the specified number of colors: 4 (yellow, magenta, cyan, black). Additionally, supports full color UV or monochrome UV printing, ensuring versatility and high-quality results for various printing needs. Refer to Section 4.1.4
<u>V. Work desk support for each specialized equipment:</u>	

<ul style="list-style-type: none"> · Work desk with integrated slots for cable management, · Mounted on rollers with locking brakes. · Open shelves for rack-mounted device. 	Compliant Refer to Section 4.8
<u>VI. Commissioning services and support:</u>	
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: Compliant	
<ul style="list-style-type: none"> · Adaptation support with the national document production System at the Buyer's headquarters and remotely (if applicable) at the equipment commissioning stage; 	Compliant Refer to Section 5.2
<ul style="list-style-type: none"> · Supply of spare parts kit (both tools and spare parts) which will enable the Buyer's technical team to perform level 1 and 2 interventions to replace any defective items that could stop the equipment from working; 	Compliant Refer to Section 5.2
<ul style="list-style-type: none"> · 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 by the technical specialists of the Buyer; 	Compliant Refer to Section 5.2
<ul style="list-style-type: none"> · Providing accompanying documentation: <ul style="list-style-type: none"> - 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 Refer to Section 5.2
<ul style="list-style-type: none"> · Configuration and personalization of passport models (polycarbonate data page and personal data onto the observation page (page 3) provided by the Buyer (personalized model for each type of document): 	Compliant Refer to Section 5.2
<ul style="list-style-type: none"> · 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 Refer to Section 5.2
<u>VII. Warranty</u>	



<p>Warranty: min. 36 months (after delivery, commissioning and signing of the act of receiving and handing over the goods).</p> <p>All costs of resolving warranty cases including spare parts are borne by the manufacturer.</p> <p>For the resolution of warranty cases as well as in the case of receiving technical assistance requests, the following reaction times will be observed:</p> <ul style="list-style-type: none">- 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; <p>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.</p> <p>The Supplier shall present a statement that the equipment will be maintained and repaired for a period of at least 10 years with the assurance of the availability of parts during this period.</p>	<p>Compliant Refer to Section 5.2.1</p>
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4. Specialized equipment for personalizing passports/travel documents with polycarbonate data

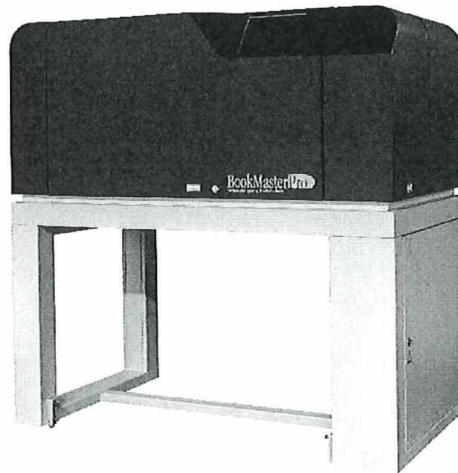


Figure 1 BookMaster® Pro System

The offered solution includes four (4) BookMaster® Pro Systems with work desks, commissioning services, support, and warranty as detailed in Annex 1.1. The BookMaster® Pro personalizes mid-volume passports in ID-3 format, adhering to ICAO 9303 standards. It uses laser engraving and inkjet printing technology to personalize the datapage (page 2) and observation page (page 3), encodes data into the passport chip, and inspects passports. The System can produce up to 150 passports per hour with industrial design for continuous production. Its modular design allows selection of functionalities based on needs, ensuring reliability and efficiency with consistent forensic quality. The System is mounted on a wheeled base for easy movement and stability.

The BookMaster® Pro System includes the following features:

- Advanced laser engraving and inkjet printing with a user-friendly graphical interface.
- Industrial design utilizing durable, high-quality components to ensure high availability and stable production.
- Simplified maintenance with easy access to integrated process units
- Minimal need for operator intervention
- Consistent high-quality performance with proven reliability

The system features a well-defined open interface, including:

- Chip encoding Interface.
- Well-defined Open Host interface.

4.1 Detailed specifications and configuration of the offered BookMaster® Pro Systems compliant to the tender specifications

The offered BMPro Systems will be configured with the below functionalities base on the tender requirements stated in Annex 1.1, to personalize the shared layout, provided by the Buyer during the clarification tender process. See Figure 2. The BMPro will personalize the defined layout with the required speed of 100 passport/hour.

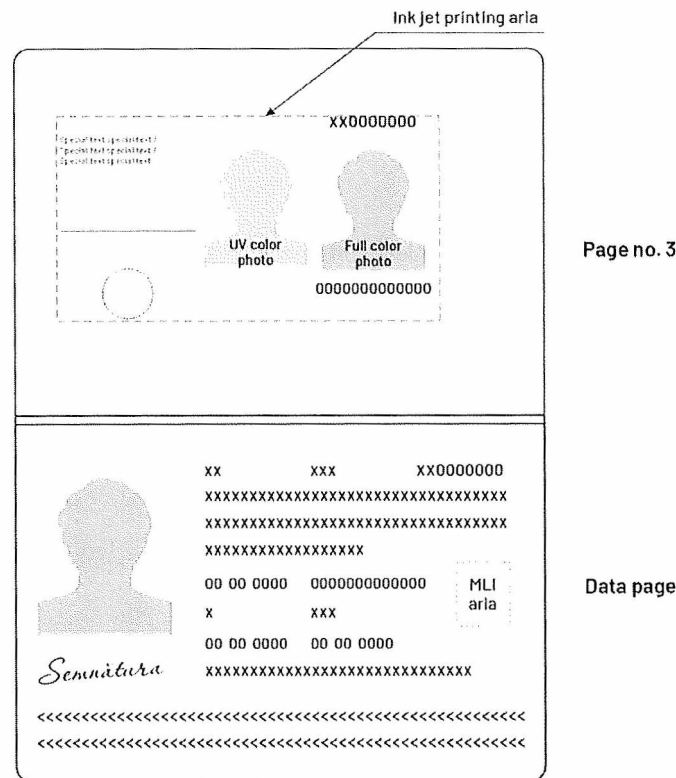


Figure 2 Layout from shared link during tender clarification phase <https://asp.cloud.qov.md/index.php/s/ack8JcwbtifEHnE>

Note : For all types of passports, 2 types of photos and numbers (the black ones) will be printed on page 3. "Special text special text / , Special text special text / and Special text special text" (green text) is an example of the arrangement of standard information that will be printed in some cases for some types of passports. The size and number of characters for these cases will remain the same.

4.1.1 INPUT UNIT AND OUTPUT UNIT

The BMPro is equipped with an automated input stacker. The operator opens the booklet and places the opened booklet in the stacker. The stacker can hold up a minimum of 300 booklets. The input unit is electronically locked during production. The operator can open the door by pressing a button on the touch screen if the System refills empty booklets during production. This touchscreen is of minimum 8"(inches).

The Output Unit of the System can hold up to 30 pre-opened booklets. The finished books are stacked into the output stacker. The stacker is locked during production as the input.

Rejected books are placed in a space below the output stacker in the reject tray. When a certain level of rejected books is reached, the System will stop operation and signal the operator.

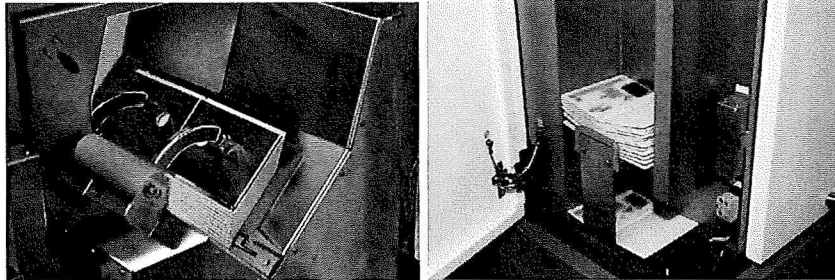


Figure 3 Input (left image), output stacker and rejected booklets (right image)

The BMPPro control system transports passports to the reject position in the following situations:

- The production process was interrupted while the passport was being processed.
- The front cover was opened while the passport was inside the machine.
- The passport number could not be read out.
- The reference marker on the data card (fiducial) could not be read out.
- The personal particulars belonging to the book number were not found.
- Encoding of the chip failed.
- Engraving and or printing failed.

Booklet transport

BMPPro ensures efficient and reliable transport of passports between the input and output. Spring-action mechanisms facilitate the linear movement of the booklets, which pass through a V-shaped groove with guide plates. To ensure flat pages during engraving, the booklet bindings are slightly overstretched just before the engraving process.

The BMPPro is equipped with multiple processing units that handle several booklets simultaneously, ensuring each booklet goes through every processing position. In the event of a booklet becoming stuck, the conveyor mechanism can be accessed from various points for easy removal.

4.1.2 IDENTIFICATION AND CHIP ENCODING UNIT

The BMPPro has an Identification unit for reading a barcode printed on a label located at the outside back cover of the booklet or pre-programmed number from the chip (this requires a chip encoding unit). The barcode will be used to; refer to document Host protocol interface document provided by the Supplier.

Handwritten signature



Figure 4 Barcode on the back cover

The Chip Encoding Unit is configured with one (1) Smartware programming head for contactless encoding of the chip enabling an expected encoding time between 20sec and 25 sec for the shared layout (Figure 2). The system will be delivered with a chip encoding interface, allowing you to use your own or third-party encoding software.

System will be delivered by all necessary licenses, if applicable, elated to the Intellectual Property Rights throughout the stated lifetime and without any limitations of the number of documents produced(type ID-3) through this equipment.

The following functionalities can be performed by the Buyer's chip encoding software:

1. Chip-alive-check. Before programming, the chip can be checked to see if it works.
2. The BMPPro sends booklets with malfunctioning chips to the reject tray without further processing. Booklets with broken chips can be returned to the Supplier unprocessed.
3. Reading of a pre-programmed number to identify the booklet. The corresponding personal data is then retrieved from the host computer (from the Contracting authority) for the personalization process.
4. High speed programming of the contactless electronic chip. The encoding unit supports among others Active Authentication and Basic and Extended Access Control (including PACE), following ICAO's recommendations. Chip encoding with Smartware hardware, supporting ISO-14443 type A and type B communication protocol.

4.1.3 LASER ENGRAVING UNIT

The laser engraving unit applies the photograph, personal data and MRZ data onto the polycarbonate data page, being page 2 of the passport. This unit contains one (1) fiber laser of 30 Watt and can apply the MLI security feature. The information is engraved with a standard resolution of 600 dpi. See Figure 2.

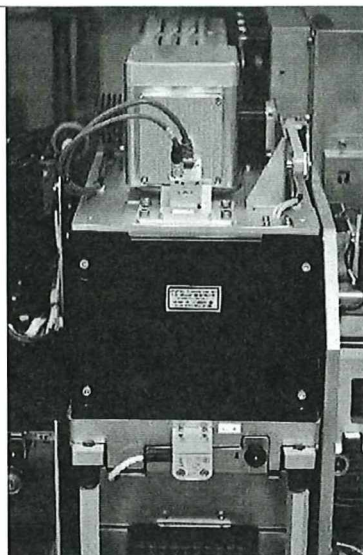


Figure 5 Laser engraving unit

The sharpness of an image is determined by a combination of spot size and resolution. Supplier has optimized its spot size for a resolution of 600 dpi, resulting in sharp, high-quality photographs without the need for photo-enhancement software. This optimization ensures that our laser Systems consistently produce images that meet the specified resolution requirement, guaranteeing clarity and detail in all outputs.

Type	Fiber Laser
Impulse width and/or power	Adjustable
Power	30W
Wavelength	1.064nm
Resolution	600 dpi
Expected Lifetime of Laser light source	Minimum 60.000 hours
Suitable material	Polycarbonate
Markings	<p>Markup of textual data (TTF fonts), vector, raster graphics (images, signatures), as well as one- and two dimensional barcodes (including QR codes).</p> <p>Raster fonts should be Windows TrueType fonts. New fonts can be supported. The equipment can adopt vector fonts provided by the Buyer.</p>

Table 1 Data sheet Fiber Laser 30 W

ts

The photograph and text is applied using grey scale levels. Text can be engraved tactile.

Our solution includes standard laser personalization features such as a transparent window, ghost image, and tactile elements.

Because we developed our own laser head and software, our laser engraving technology has some distinct benefits:

- Full control over the laser power. This is needed in order to create perfect greyscales for each passport material and to create high quality images without the need for photo-enhancement software.
- Every laser within a project can be calibrated so that they create exactly the same greyscales, resulting in forensically identical passports when produced on different laser systems.
- The highly stable laser and optical system provide constant performance. The greyscales do not deteriorate during the day once the system is warmed up. The laser does not degenerate during the lifetime of the system.
- Unlike when using standard laser modules, we control the complete engraving process from A to Z. This enables us to do special features or applications for our Buyers.

The proposed solution for the tender involves several key technical specifications to ensure high-quality tactile engraving and personalization of data pages

Data Positioning:

- The exact position of the engraving is determined by a camera that detects an aligning symbol on the datapage ('fiducial'). The camera aligns the personal data relative to the headers.
- Camera reads fiducial marks, registration marks, preprinted text, or other preprinted features to position engraved information.
- Fiducials used for positioning personalized elements.
- For the positioning of the MLI personalized elements, a fiducial will be used. These are varying figures that are engraved over each other from various angles (overlapping).

Systems will be accompanied by all necessary licenses, if applicable, relating to Intellectual Property Rights for the entire stated life period and without limitation on the number of documents produced (type ID-3) through this equipment.

4.1.4 INKJET UNIT

The Inkjet Printing Unit can apply the photograph and personal data onto the observation page, being page 3 of the passport. This unit contains a DoD inkjet printer with industrial piezo electric printing heads, using UV curing inks CMYK(Cyan, Magenta, Yellow, Key=Black) to print observation page in full color and Monochrome UV ink as defined in passport layout provided by the buyer. See Figure 2.

Our printing system ensures optimal performance by automatically sealing the printer heads when not in use to prevent drying out. It also features a "purging" function to clean the heads, with excess ink collected in a replaceable tray.

The BMPro uses UV curable inks. The ink is pre-cured immediately after jetting (inline) with a UV light. This process is called 'pinning' and increases the viscosity of the ink so that the ink is kept in place. The printed passport then passes under the UV light again to finish the curing process.

The use of UV curable inks has some distinct benefits:

- It creates a secure image, as the hardening of the ink by UV light is irreversible. The technology is not available for the commercial market.
- The print quality is not dependent on the (very absorbent) passport paper. The process of pinning offers accurate control over the amount of absorption into the paper.
- The inks hardens in seconds under UV light, allowing high speed personalisation of the passport without curling of the data pages.
- The inkjet unit requires little maintenance, as the ink only hardens under UV light. This prevents clogging of the nozzles in the print heads.
- The ink containers in the BookMaster Pro system allow many weeks of printing and are easy to refill. Refill comes in exchangeable units and is very competitively priced compared to cartridge alternatives. UV curing inks are consumables and not available on the commercial market.
- Inkjet prints are resistant to removal, water, solvents, and prolonged sunlight exposure.
- Maintains vibrant color images even under harsh conditions.

4.1.5 INTEGRITY CHECK

The BMpro will be equipped with one camera that verifies whether the correct data is printed, engraved or encoded in the correct way. Verification occurs within the Inkjet unit, where a camera (5Megapixel) checks whether the correct data is personalized accurately. If a passport fails the tests, it is conveyed into the reject tray. Approved passports are sent to the output tray. The results are reported back to the Buyer's host computer.

The following is verified:

- Photo: The inspection system compares the image from the camera with the original image file received from the host computer.
- MRZ: The MRZ-data read by the camera is compared with the original MRZ file received from the host computer.
- Chip programmed content: The MRZ-file on the Host is used to get access to the Chip data. If this is successful then the DG1 is read and compared to the DG1 file on the host.

-
- MRZ integrity host files: The MRZ data in the host files (text file and chip data file) are compared to ensure MRZ integrity in the host files.

4.2 Cooling System and Air Management

The laser unit and BMPPro control system require effective cooling, which is facilitated by various air inlets on the casing. Internal fans utilize ambient air to cool the machine, with the majority of the cooling air exiting through large openings in the covers.

A portion of the incoming air is directed through the laser zone to eliminate vapours from burnt synthetic particles. These vapours are then filtered out of the machine via an active carbon filter.

It is the user's responsibility to regularly replace the carbon filter element to prevent unpleasant odours from escaping into the surrounding area. Additionally, a service technician must perform an annual cleaning of the machine using an industrial vacuum cleaner.

4.3 Interface/ System control

The system controller consists of an embedded computer with hard drive and software, which controls all activities within the BMPPro system. BMPPro system is equipped with a write filter to protect the operating system in case of a power failure. The main switch is used as an emergency stop button in case of an emergency so the operator can stop the system immediately.

- The specifications of the integrated computer are as follows:

CPU: Intel Core i7 7600

RAM: 8GB

Storage: 64GB SSD

In the event that additional CPU, RAM, or storage is required, it will be provided to guarantee optimal performance.

The BMPPro system is connected to the host computer which supplies the data needed for the graphical personalization. The BMPPro system interfaces with the Buyer's host computer using a well-defined open host protocol. The layout files determine the position, font, and properties, of the engraved content. Supplier prepares the required personalization layouts as agreed with the Buyer in the early stages of the project.

The System communicates with a designated PC that operates the chip encoding software. This PC is directly connected to the encoding heads and utilizes the reader's interface protocol provided by the reader's hardware Supplier for communication. To interface with the BM Pro system, a well-defined open interface based on a TCP/IP Buyer-server protocol is available.

The host computer, the chip encoding computer, its application software/encoding software and the network infrastructure are not part of the delivery.

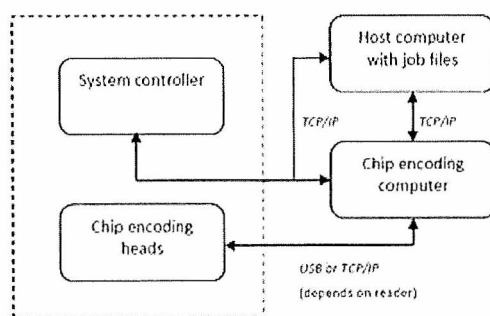


Figure 6 Interfacing between BookMaster Pro system and external computers.

4.4 Offered BMPro Datasheet

Specification	Details
Document Specifications	ID-3 (ISO 7810/ICAO 9303)
Datapage Material	Polycarbonate
Electronic Chip	ISO 14443 compliant, type A/B
Software Platform	Well-defined communication protocol
Production Rate	100 passports per hour for the defined layout
Laser Unit	Fiber Laser, 30W
Resolution (Laser Unit)	600 dpi
Inkjet Unit	DoD Technology, CMYK and UV Monochrome
Resolution (Inkjet Unit)	600 dpi
Dimensions	150 cm (W) x 150 cm (H) x 80 cm (L)
Weight	Approx. 360 kg
Licensed operating System	Windows 10
External connectivity	HDMI, USB (optional)
Data transfer rate	up to 424 kBit/sec
Air Humidity	45-60% (non-condensing)
Room Around the System	Approachable from front and back-side (approx. 1m required). System can be moved if access to back is required.

Table 2 BMPro DataSheet

4.5 BPro Operation

Operating the BPro is easy and safe. The actual production of the passports in the BPro is fully automated.

The BPro System complies with the European safety standards and is equipped with the CE-mark. The BPro System also complies with class I requirements of the EN80625 standard on radiation safety, which means that:

- The System operator does not need special training in laser safety.
- The System operator does not have to wear any means for personal protection.
- In normal operation, no additional measures for the safety of persons in the environment of the System are necessary.

4.6 User Interface

The BPro is controlled by the operator through an operator interface using a touch screen display mounted on the cover. The BPro has been provided with a touchscreen for monitoring, operation and optimization of the production process. The menu driven design of the software offers flexible and easy operation of the system. The software shows menus on the screen, including notifications and control buttons. When you push the control button on the touchscreen, the function in question is activated. The screen is located at the front of the System. The operator interface shows the activities performed in the system and allows the operator to control the system. Among others, the operator can select one or more jobs to be processed on the system and start and stop production. The menus for the operator are available in English or in another language.

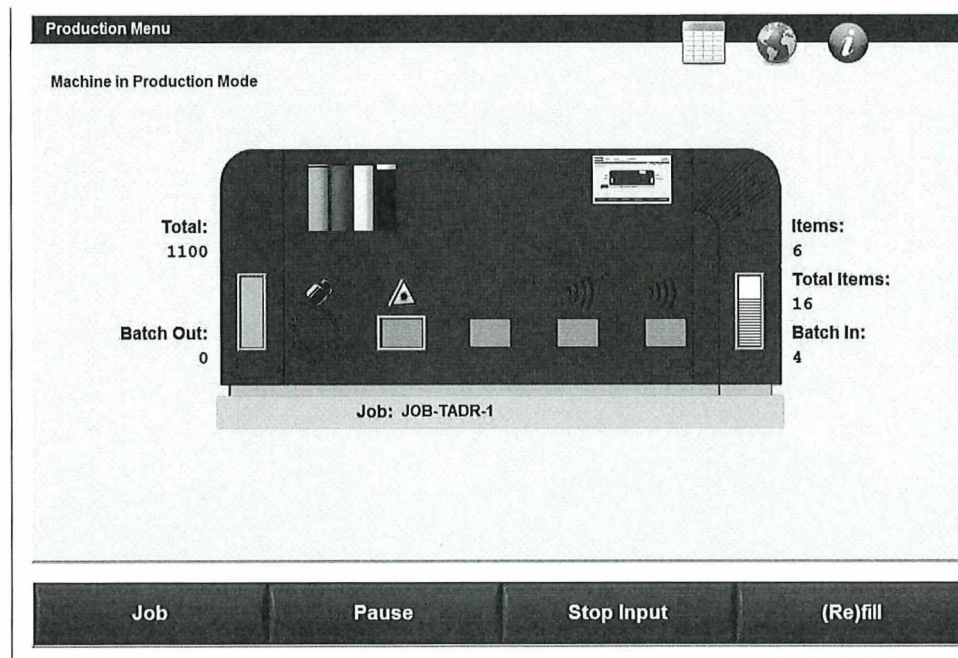


Figure 7 Example menu on the touchscreen

The operator has to log-on in order to perform any actions on the BPro. Operator log-on is secured by a password. Several access levels are available (administrator, operator, service).

The BPro logs information of the processed passports, the operator logon/log-off and error messages that have been displayed. All data is logged onto the system controller's hard disk and when

a certain maximum is reached the oldest data is removed automatically. All logged data can be sent to the host computer as files if needed.

The BMPPro offers the following standard reports:

- Production overview report
- Passport detail report
- Error message report

In case a passport obstructs the BMPPro, the operator can easily remove the particular passport that causes the problem. The rest of the passports remain in the system and the operator can resume processing the batch immediately. In most cases, unfinished passports can be completed in the BMPPro in order to reduce wastage even further.

4.7 Operator handling

The operator handling consists of the following tasks:

- Operating the user interface,
- Adding new passport to the input tray,
- Removing processed passport from the output tray,
- Emptying the reject bin and,
- Assisting when a passports causes a problem in the System

4.8 Work desk support for each specialized equipment

Together with the Personalization equipment the work desks designed to support each specialized equipment will be delivered. These desks feature integrated slots for cable management, are mounted on rollers with locking brakes for easy mobility and stability and include open shelves for rack-mounted devices.

Below is an image illustrating the type of table we will deliver. Work desk specs will need to be aligned with the buyer after award.

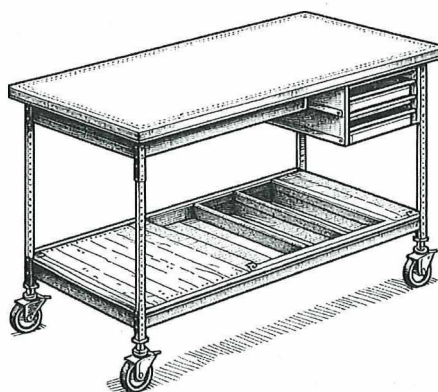


Figure 8 Work Desk Technical drawing.

5. Commissioning services and support

Deploying the system involves several components to ensure successful implementation:

- Point of Contact: One designated Project Manager will oversee the entire project. They will act as the primary contact between the parties.
- Implementation Meetings: A kick-off meeting will be held at the beginning of the project to align all stakeholders.
- Roles and Responsibilities: Different roles within the project team will be outlined, ensuring smooth execution of tasks.

5.1 Project Phases

5.1.1 Initiation

The project begins with the initiation phase, where key activities include drafting essential documents such as the User Requirements Specification (URS) and Acceptance Test Specification (ATS). It is crucial to have from the Buyer the personalization specifications available during this phase, as they are vital for the preparation of the URS. These specifications are then used to accurately define the machine configuration and proceed with the project.

5.1.2 Project Documents

Critical documents will be created and approved during this phase; these includes:

- User Requirements Specification (URS): document outlines the features, choices, and applications to be delivered to the customer. It specifies the technical requirements for the machine, including the number of units (Input/Engrave/Output) and the exact units within those sections. It also includes references to other specifications to ensure completeness.
- Acceptance Test Specification (ATS): document describes the acceptance tests for the Buyer. It details the tests to be performed to check if the system meets the URS requirements. These tests include safety tests, accuracy tests, stability tests, and process validations. The ATS is used during both the Factory Acceptance Test (FAT) and the Site Acceptance Test (SAT) to ensure the system functions correctly and meets the specified criteria.
- Final Installation Requirements (IRS): document specifies the installation requirements for the systems to be installed at the customer's site. It includes details on electrical connections, data/Ethernet connections, floor loads, and machine sizing in line with the tender specs. The IRS ensures that the system is installed correctly and operates efficiently within the specified environmental parameters.
- Approved ATS and URS.
- Integration documentation. Please refer to Annex 6.4 and Annex 6.3.
- SDK (software development kit) as well as software emulation of perso equipment to ease the integration into the perso system.
- Systems manuals for the use and maintenance of the equipment in English.

5.1.3 Test Materials

The Buyer must provide the necessary test materials, including the defined number of passports to ensure proper testing and validation. A well-prepared test set is received to facilitate the forthcoming phases. This Test set is to be provided early August 2025. The Buyer must provide specific booklets per machine for the FAT and SAT phases:

- For FAT:
 - Total booklets required: 1500 per System
 - Delivery timelines:
 - 3000 booklets with chip
 - 2800 booklets without chip
 - 200 white booklets

For SAT:

- Total booklets required: 500 per System with chip
- At least 2000 booklets for all four (4) Systems for fine-tuning and SAT protocol

5.1.4 Engineering, Realization, and Verification Phase

This phase includes:

- Preparation of the internal document "Technical Product Description" (TPD): After approval by the Buyer of the URS and ATS, the TPD required for the realization of the systems is drawn up.
- Purchasing of parts.
- Assembly and testing of units.
- Configuration and personalization of passport models (polycarbonate data page and personal data onto the observation page (page 3) provided by the Buyer (personalized model for each type of document)).
- Pre-integration by perso system supplier within the premises of the perso equipment supplier (pre-FAT).
- Factory Acceptance Test (FAT).

A successful completion of FAT transitions the project to the next steps.

5.1.5 Packaging and Shipment

Packaging of the machine sections readies them for shipment. Delivery is conducted under Delivered At Place (DAP) terms, ensuring the equipment reaches the buyer's site.

Together with the systems a spare parts kit (both tools and spare parts) will be delivered. See Section 6.2

5.1.6 Connection at Site

Once delivered, the equipment undergoes fine-tuning and integration on-site, preparing it for the Site Acceptance Test (SAT). Supplier will support the integration of the perso equipment into the personalization system.

5.1.7 Site Acceptance Test (SAT)

Conducted at the Buyer's location, SAT ensures the system meets all specifications and requirements outlined in the ATS.

5.1.8 Training

Training programs provided in English include:

-
- Operator training and 1st Line training. Together with this training an operator manual will be provided which contains also a part regarding the first line maintenance of the System(s). Operator and first-line maintenance training for up to 10 participants.
 - 2nd line maintenance training. Together with this training a service manual will be provided which contains also a part regarding Parts Replacement for the System(s). Second-line maintenance training for up to 3 participants.

These comprehensive training sessions ensure that the Buyer's team is well-equipped to operate and maintain the system.

Manual for operators and second-line maintenance will be handed over in hard copy or soft copy to participants. Training will be provided at the site, supported by training material and hands-on training. The Buyer must ensure to have a System available for the training.

After each training evaluation, participants will receive a certificate.

5.1.9 Proof of Delivery and Acceptance

Proof of delivery, installation, integration/adaptation and commissioning of the equipment, including training of personnel, shall be confirmed by the parties' signature of the Act of delivery-receipt of the Goods (drawn up in duplicate).

The delivery of the equipment, along with their integration and adaptation, is expected to be completed by December 1, 2025, provided that the contract is signed by both parties between May and June 2025. In case the signature is done after the stated date, this will impact the completion by December 1, 2025, and the parties will need to sit and discuss the way to move forward.

5.2 Warranty and Support Services

Warranty and support services will commence after the proof of delivery, installation, integration/adaptation, and commissioning of the equipment, including training of personnel. This will be confirmed by the parties' signature on the Act of delivery-receipt of the Goods, drawn up in duplicate and accepted.

5.2.1 Warranty Guidelines – 36 months

- Minimum 36 months of warranty (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.
- 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.
- The Warranty will lapse in case of incompetent use, overdue maintenance, if the System(s) are sold to a third party other than the intended End-Contracting authority, modifications to the System(s) are performed by people other than Supplier authorized personnel, and by using parts which are not recommended and supplied by Supplier.

During the warranty period, Supplier's Helpdesk is available for email and/or telephone support in case of technical problems. The Helpdesk is available during Working Hours, which are from 8:00 a.m. to 5:00 p.m., according to the time zone of the Republic of Moldova. Working days are according to the calendar of the Republic of Moldova.

If during the warranty period the Contracting authority deems that the whole or part of the Products delivered by the Supplier are not in conformity with the specifications as set out in the Agreement, the Contracting authority shall comply with the defined RMA (Return Merchandise Authorization) process. Supplier will provide the details once the contract is awarded.

5.2.2 Service Level Agreement (SLA)

The SLA provided includes comprehensive training for the Buyer's team to operate the machine daily, perform first-line maintenance, and execute second-line maintenance, enabling them to troubleshoot and replace parts. If the Buyer's team cannot manage these tasks, they can call the helpdesk for remote support. Support can be requested via email or telephone by providing the necessary information for the Supplier to assist.

The Buyer will inform the Supplier in detail, the nature of the fault, serial number of the System and any other necessary information to solve the existing problems.

The Notice of Defect should be addressed to:

IAI industrial systems B.V.
Service Department
Tel: + 31 40 2185000
e-mail: service@iai.nl

The Notice of Defect should contain following information:

- machine number
- detailed problem description
- name
- date
- signature
- person to be contacted
- return communication channel

5.2.3 Preventive Maintenance

Throughout the 36-month warranty period, we will provide preventive visits to ensure the equipment operates at optimal performance. This service includes two on-site visits by our specialized service engineers, designed to thoroughly inspect and maintain your equipment, addressing any potential issues proactively.

Proper maintenance is essential for the longevity and efficiency of your machines. Regular check-ups and timely interventions help prevent unexpected breakdowns, reduce downtime, and ensure your equipment runs at peak performance.

Preventive Maintenance shall include the following with respect to the Equipment:

- checking the condition;
- functional check;
- adjustments and alignments, if necessary;
- cleaning and necessary lubrication; and
- advising the Buyer about foreseeable maintenance actions, if applicable.

Insofar as they can be performed within the Preventive Maintenance Duration, the following other activities may be performed:

- Corrective Maintenance;
- the introduction of modifications to finally resolve a defect that has been solved provisionally before;
- the introduction of modifications to improve the reliability of the Equipment;
- replacement of Wearing Parts;
- additional training or advising of the Buyer's personnel.

Supplier will notify and agreed with the Buyer at least one (1) month in advance of the time when the Preventive Maintenance will be carried out.



6. Annexes

6.1 Preliminary Installations Requirements specifications (IRS)

These preliminary specifications serve as a foundational guideline, providing an overview of the essential elements and conditions that need to be addressed for the equipment installation.

Environment Specifications for BookMaster Pro	
Name/function	Specification / description
Environment temperature	$18 \leq t \leq 30 \text{ }^{\circ}\text{C}$
Air humidity	45-60% non-condensing
Dew point	$< 15 \text{ }^{\circ}\text{C}$
Air refreshment	The system needs to be placed in a ventilated space
Heat load	Approx. 850 Watt

Table 3 Floor and environment specifications for BookMaster Pro

Electrical Requirements for BookMaster Pro	
Name/function	Specification / description
Electrical services	110-240 VAC \pm 10%, 50-60Hz
Ground resistance	$\leq 2 \text{ Ohm}$
Fuses	13A
Power during production	approx. 1 kVA
Current during production	approx. 4.5A at 240 VAC
Inrush current	To be measured, max 80A

Table 4 Electrical requirements for BookMaster Pro

Computer Network Specifications for BookMaster Pro	
Name/function	Specification / description
Physical connection	2 x UTP

Table 5 Computer network specifications for BookMaster Pro

Dimensions during transport	
Name/function	Specification / description
Outer dimensions casing (width x depth x height)	1760 x 1100 x 1760 mm
Weight	approx. 450 kg

Table 6 Dimensions during transport

Dimensions BookMaster Pro	
Name/function	Specification / description
Outer dimensions	See figure below
Weight	approx. 360 kg
Room around the System	Approachable from front and back-side (approx. 1m required). System can be moved if access to back is required.

Table 7 Dimensions BookMaster Pro

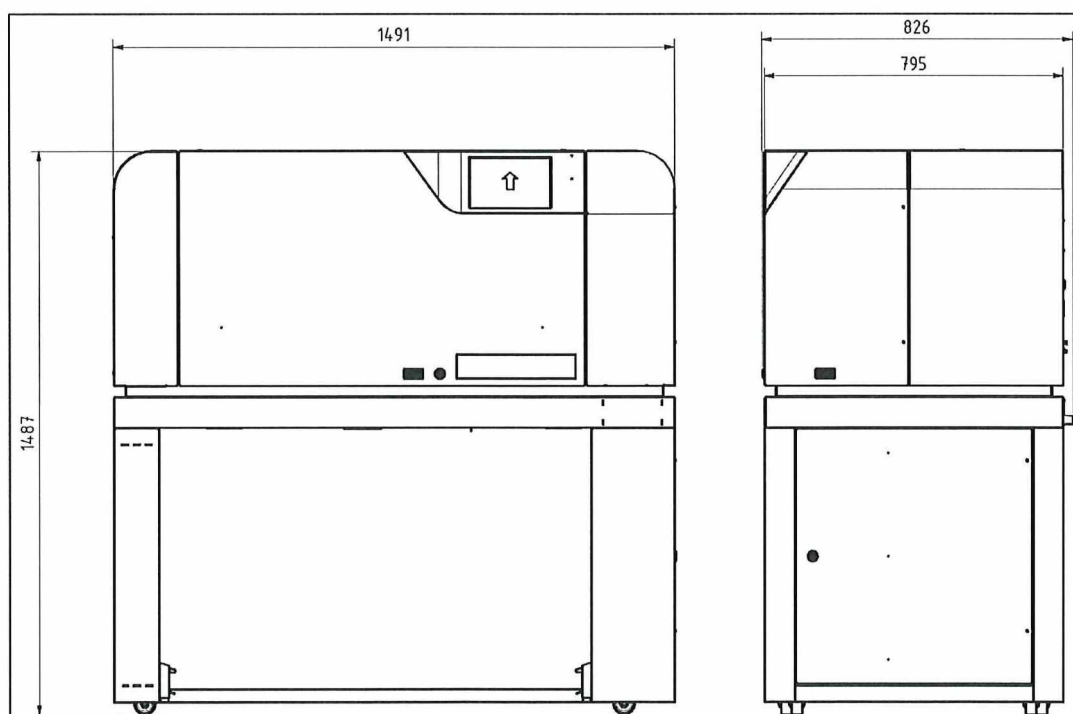


Figure 9 Outer dimensions BookMaster Pro

Handwritten signature

6.2 Preliminary list of spare parts

This preliminary list of spare parts refers to an initial compilation of essential components that may be required for maintenance and repairs. This list is subject to change and will be updated once the Technical Product Documentation (TPD) is finalized. Only after the TPD is defined can a comprehensive and accurate final list of spare parts be drafted, ensuring that all necessary parts are accounted for based on the detailed specifications and requirements of the project.

Line	Rec. Qty	Description
1	1	Axial compact fan
2	1	Bushing
3	1	Bushing
4	2	Damper
5	1	Spring plate
6	1	Smartware encoding head
7	2	Carbon filter
8	1	Pulley
9	1	Stepnet micro module
10	1	Power supply
11	1	RTC
12	1	Tool case
13	1	RF driver assembly
14	2	Compression spring
15	2	Compression spring
16	2	Spring
17	2	Spring
18	1	Gas spring
19	1	Leafspring carrier
20	1	Ball bearing
21	1	Bearing
22	1	Timing belt
23	1	Bearing
24	1	Manual ink valve
25	1	Mini Contactor
26	10	Diode, zener; 7V5
27	1	Motor
28	1	Motor
29	2	Cylindric damper
30	1	Coded safety switch
31	1	Leaf spring
32	2	Cylindric damper
33	2	Plain bearing
34	2	Cylindric damper
35	1	Spring customized
36	1	Key switch
37	1	Power supply
38	1	Power supply
39	1	Fuse module
40	1	Optical sensor
41	1	Optical sensor
42	1	Encoder
43	1	Sensor assembly



44	1	Plain bearing
45	1	LED
46	1	Switchpart front 1nc CC
47	1	Switchpart front 1no CC
48	1	Networkswitch
49	1	Fan assembly
50	1	Camera
51	1	FIM leaf spring
52	1	Sensor assembly
53	1	Sensor assembly
54	1	Industrial PC
55	1	LED assembly L16
56	1	LED assembly 3 x IR
57	1	Antenna
58	1	US-PICC2-2P (2CTL) OEM
59	2	Plain bearing
60	1	Set1 spring-loaded term
61	1	Timing belt
62	2	Cleaning nozzle
63	2	Carbon filter 50 dia
64	1	Pulley
65	1	Acoustic alarm module
66	10	Fuse
67	2	Vibration damper
68	2	Spring
69	2	Spring
70	2	Spring
71	2	O-ring
72	2	O-ring
73	2	O-ring
74	2	O-ring
75	2	Spring
76	2	O-ring
77	2	Compression spring
78	1	UV light
79	1	UV light
80	1	USB Hub
81	1	Pawl with bearing
82	1	Bearing
83	2	Spring
84	1	Single relay
85	1	Densitometer
86	1	Auxiliary contact 2no
87	1	LED driver pcb V3
88	1	Fan
89	2	O-ring
90	1	Solenoid with connector
91	1	Safety PLC
92	1	Safety PLC Input module
93	1	Flow sensor
94	1	Single relay
95	1	Single relay
96	1	Ink management



97	2	O-ring
98	1	Reader bord
99	1	Print Manager Board
100	1	Inkjet Print Head
101	1	Touchscreen
102	1	Magnifier with light

