

MB DATA PREPARATION

FOR VISUAL & ELECTRONIC PERSONALIZATION OF ID DOCUMENTS



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MÜHLBAUER GROUP AT A GLANCE

MÜHLBAUER'S BUSINESS UNITS AND SITES

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

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

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

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



MPS
Precision Parts & Surface Engineering



AUTOMATION
Production Equipment & Systems



WORLD OF TECURITY®
Government & Technology Solutions





MB Data Preparation

FOR ICAO-COMPLIANT eMRTD

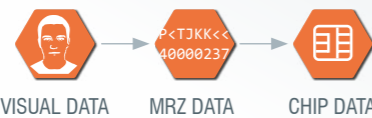
ID DOCUMENTS

Identification documents such as ePassports, eID cards and driver's license cards have to meet certain requirements regarding visual and electronic personalization. Many elements are internationally standardized in order to ensure full readability and interoperability, for example:

- Machine Readable Zone (MRZ)
- ICAO-compliant holder image
- Data encryption
- Digital signature

DATA PREPARATION

The data for document personalization can be taken from different sources, but must be transformed into a consistent machine-readable format.



Depending on the document type to be personalized, specific data formats have to be observed. These requirements can confirm with international standards (notably ICAO 9303 and ISO/IEC 18013-2) or individual project needs. Inconsistent data must be harmonized and transformed for further use in the personalization workflow. This process step requires MB Data Preparation.

KEY ELEMENTS



CONFIGURATION

Functionality for defining & setting up Data Preparation processes, notably

- the required data transformation
- information exchange with other systems



VISUAL & MRZ DATA PREPARATION

Preparation of data for visual document personalization, including

- concatenation, truncation, formatting
- value mapping, country codes
- image processing
- generation of
 - » time-dependent data
 - » unique document ID
 - » barcode
 - » MRZ



ELECTRONIC DATA PREPARATION

Preparation of data for electronic document personalization, including

- creation of data groups
- chip encoding
- mag-stripe encoding
- digital signature

SOLUTION BASICS

FUNCTIONAL PRINCIPLE

An appropriate software solution provides customizable functions with automatically prepare data according to the document type meant to be personalized. Such a software tool can be integrated into the data flow of a personalization management system.

In a standard setup, there are two data preparation modules in the data flow:

- One module for visual data preparation, e.g. truncation or a barcode
- One module for electronic data preparation, e.g. chip encoding & signing

DEPLOYMENT

The data preparation deployment must be adapted to project requirements and system design. It is usually based on a server environment, but it can also be deployed on a standalone workstation or even in a mobile environment.

CONFIGURATION

Trained operators can set up the required functionality for the MB Data Preparation system. They configure the details of data transformation and the information connection to other systems.



VISUAL & ELECTRONIC DATA PREPARATION

PLAIN-TEXT DATA Arbitrary textual information such as surname, given name, address and place of birth must be handled according to a consistent processing pattern. A variety of operations can be configured for visual data preparation, for example:

CONCATENATION

Arbitrary strings can be joined together, using any character string as a delimiter. Concatenation is commonly used for identifiers such as family name and given name.

SPLITTING

Character strings can be split into smaller chunks, with one or more delimiter characters, by regular expression or by length.

INSERTION

Concatenation and splitting can be combined in order to insert characters or character strings at arbitrary positions into existing values.

TRUNCATION

In consideration of the font type used, values which are longer than the available space can be truncated based on the number of characters or the actual length in millimeters.

PRE-DEFINED DATA

COUNTRY CODES

All country codes, as defined by ICAO 9303 or ISO 3166, can be translated into either the country name or the nationality term in various languages.

VALUE MAPPING

Any value can be mapped to any value based on a definition file or mapping file, e.g.

- mapping of the gender code (F=female, M=male etc.)
- mapping of a defined code to the name of the enrollment station

DATE FORMATTING

Date values can automatically be converted into formats like “DDbMMbYYYY” or other variants, including bilingual combinations such as “dd-MMMEN/MMMFR-yyyy”.

GENERATED DATA

TIME-DEPENDING DATA

Based on an input date or the current date, calendar-based values such as date or time can automatically be calculated by adding a time period (e.g. validity), which can be differentiated depending on individual conditions (e.g. age of applicant, document type etc.).

UNIQUE DOCUMENT ID

Unique document identifiers can automatically be generated, for example as sequential numbers or with a prefix and Luhn-30 document numbers for automatic error detection.

BARCODES

Information can be converted into different types of barcode images to be printed on card documents. 1D barcodes, such as Code128, can be used to encode simple numbers or text fragments (ASCII). 2D barcodes, like PDF417 or QR codes, have a higher capacity and can encode special characters or binary content like fingerprints as well. The content can either be provided or individually be compiled for each application.

GRAPHICAL DATA

SIGNATURE GRAPHICS FORMATS

Both grayscale and vector images of an applicant’s signature can be processed and placed into the corresponding signature field.

HOLDER IMAGE PROCESSING

If necessary, various image processing operations can be performed, for example

- image re-sizing
- image cropping
- color scheme mapping (e.g. from color to grayscale)

VISUAL SECURITY FEATURES

Personal information of the document holder can be applied in security features such as LetterScreen images and ghost images. Such textual data embedded in a photograph or ghost image in the background of personalized text help to protect the document against alteration and counterfeiting.

MRZ DATA PREPARATION

According to ICAO 9303 standard, the MRZ (Machine Readable Zone) must automatically be generated and formatted.

CHIP DATA PREPARATION

Data is automatically prepared, signed and encrypted for electronic personalization of chips or magnetic stripes of ICC-equipped documents, notably

- ePassports & eID cards according to ICAO 9303 standard
 - driver’s licenses according to ISO/IEC 18013-2 standard;
- biometric information such as fingerprint data must be transformed according to ICAO rules.



CONNECTION TO OTHER SYSTEMS

INTERFACES For data acquisition, processing and output, the data preparation system must provide interfaces to various other components of the personalization solution, e.g.

- the chip-coding module of the personalization machine
- the Document Signer of the Public Key Infrastructure (PKI)
- the data & user management systems



FILE-BASED DATA INTERFACE

This interface processes XML files. Binary data should be included in the XML as base64-encoded elements. The structure of the XML is defined in XSD. One dedicated input and output directory per data preparation process is required.



WEB-SERVICE DATA INTERFACE

A web-service interface allows to send multiple requests to the data preparation application. The web request contains an XML according to the XSD. The binary data is included in the XML as base64-encoded elements.



DOCUMENT SIGNER

Interaction with the Document Signer (part of PKI) allows to sign data for electronic personalization.



USER MANAGEMENT

The data preparation system can be integrated into a user management solution in order to protect, encrypt, decrypt and electronically sign data.





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