

The CardMaster Desk

GENERAL SYSTEM DESCRIPTION

This document provides a brief description of *possible functionalities* available on the CardMaster Desk platform and a short description of its operation. Please refer to your Project Quotation for the configuration of the offered CardMaster Desk system.

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Introduction

IAI's CardMaster Desk is a fully automatic desktop system for the graphical personalisation of ID1-format cards using laser technology. The system performs the electronic and graphical personalisation of cards according to ICAO's latest recommendations.



Figure 1 - The CardMaster Desk system

- Fully automatic desktop system
- Electronic chip encoding for contact and/or contactless chips
- High quality laser engraving, including tactile engraving and CLI or MLI
- High output, high yield and high uptime
- Easy and safe to operate and maintain
- Industrial design and long lifespan
- Proven performance in the market of security documents

Functional description

The CardMaster platform has a modular set-up. You can compose your CardMaster Desk system with functional units as required. Within a functional unit, there are several options to choose from. Functional units can be added or exchanged at a later stage.

Overview

An overview of available functionalities is given in the table below:

Functional units	Options
Input unit	
Card identification	Number or barcode
Chip encoding	Contactless readers, contact readers or a combination of both
Laser engraving	CLI or MLI
Verification	
Output unit	

Table 1 – Functional units of the CardMaster Desk platform

Input unit

The input tray can contain approximately 200 cards. The design of the input tray allows easy feeding of cards while the system is running. The stack level of the tray is visible for the operator at all times. The input tray feeds one card at a time into the system for processing. The system will automatically stop when the last card has been placed in the output tray.

In the situation where the card has to be identified by reading a pre-printed number or barcode, or when a contact chip has to be encoded, the cards have to be correctly orientated into the input tray by the operator.



Figure 2 – Input unit

Card identification

The cards to be processed can contain a unique number or barcode. In such case, a camera identifies the card by reading a pre-printed number or barcode. The corresponding personal data is retrieved from the customer's host computer.

The cards are fed into the system with the number or barcode faced upwards. The camera can be mechanically aligned at different positions above the card to handle different number and/or barcode positions, within an area of 3 mm from the outer edge of the card. Reading quality depends on various factors such as font design and background print.



Figure 3 – Identification camera

Chip encoding

The unit can be equipped with up to two encoding units for contactless and/or contact chip encoding. The system uses an open communication interface, allowing you to use your own encoding software. The chip encoding software is not part of the delivery.

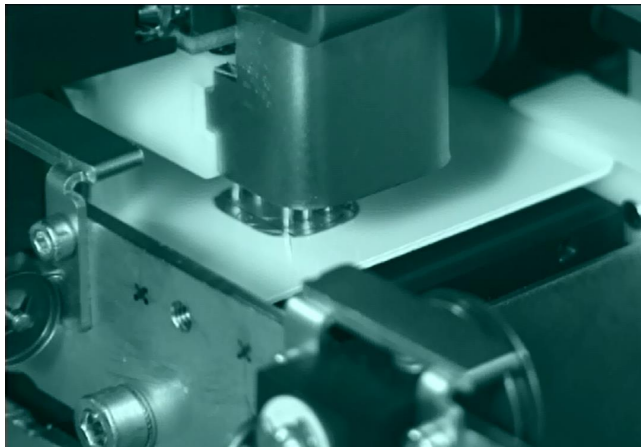


Figure 4 – Contact chip reader

Following functionalities can be performed by the customer's chip encoding software:

1. Chip-alive-check. Before programming, the chip can be checked to see if it works. The CardMaster Desk sends cards with malfunctioning chips to the reject tray without further processing. Cards with broken chips can be returned to the supplier unprocessed.
2. Reading of a pre-programmed number to identify the card. The corresponding personal data is then retrieved from the host computer for the personalisation process.
3. High speed programming of the contactless and/or contact chip. The encoding unit supports among others Active Authentication and Basic and Extended Access Control, following ICAO's recommendations.
4. Verifying applied data after encoding to check whether the data is stored correctly. The CardMaster Desk sends rejects to the reject tray without further processing.

The encoding can take place in two positions simultaneously in order to increase output.

Laser engraving

The CardMaster Desk system contains one laser which engraves the photograph, personal data and MRZ into the front and back side of the card. The information is engraved with a resolution of 600 dpi. The photograph and text is applied using grey scale levels. Text can be engraved sub-surface and/or tactile. The CardMaster Desk engraves text data using Windows true type font sets.



Figure 5 – Laser engraving unit.

The personal data can be engraved according to an alignment mark or a text field pre-printed on the card using a camera. This mark can be placed anywhere on the card, on front and/or backside, within an area of 3 mm from the edge of the card. In case MRZ data must be engraved, this information is positioned on the back side of the card and relative to the bottom of the card as specified by ICAO.

Optionally, a Multiple Laser Image (MLI) or a Changeable Laser Image (CLI) can be applied.

Verification

A vision inspection system verifies the engraved content on the front and backside of the processed cards and compares it to the original files retrieved from the host computer. If a card fails the tests, it is conveyed to the reject tray. Approved cards are sent to the output tray. All results are reported back to the CardMaster Desk's system controller.

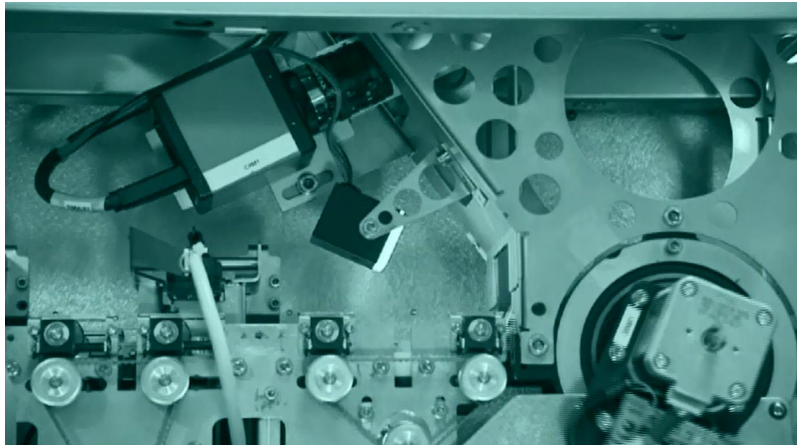


Figure 6 – Verification unit

The following will be 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.
Document number	The document number read by the camera is compared with the document number from host file.
Number integrity host files	The document numbers in the host files (document number in text and in MRZ) are compared to each other to ensure number integrity in the host files.

Output unit

The output tray contains the finished and approved cards. The system will automatically stop when the last card has been placed in the output tray. The tray can hold up to 200 cards. The design of the output tray allows easy removal of cards while the system is running.



Figure 7 – Output tray

Rejected cards as a result of processing errors will be transported to the reject tray. These rejects can be removed without opening the cover of the system but cannot be removed while the system is in production.



Figure 8 – Reject tray

The reject tray can hold up to 10 cards. The machine will stop automatically when three cards were rejected in consecutive order with an identical error. The system will continue with production after fault recovery.

System control

The system controller consists of an embedded computer with hard drive and software, which controls all activities within the CardMaster Desk system. The CardMaster Desk 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 CardMaster Desk system is connected to the host computer which supplies the data needed for the graphical personalisation. The CardMaster Desk system interfaces with the customer's host computer using an open host protocol. The layout files determine the position, font, and properties, of the engraved content. IAI prepares the required personalisation layouts. More layout files can be provided upon request.

In case the CardMaster Desk is equipped with the chip encoding unit, the system communicates with a designated PC that runs the chip encoding software. This PC is directly connected to the encoding heads and uses the reader's interface protocol as supplied by the reader's hardware supplier for communication. For interfacing with the CardMaster Desk system, an open interface is available based on a TCP/IP client-server protocol.

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

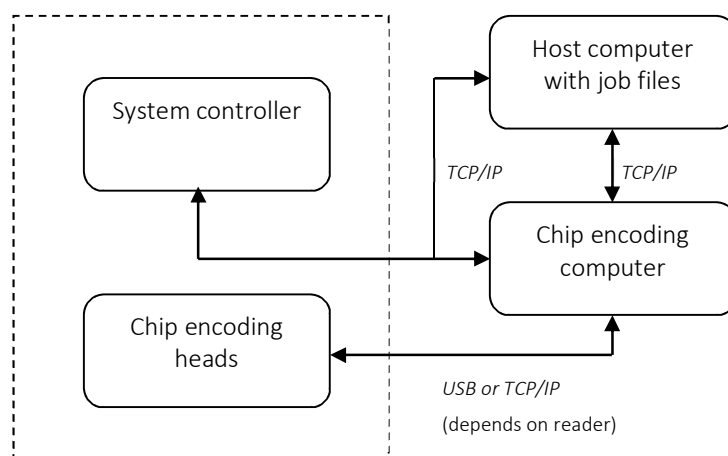


Figure 9: Interfacing between CardMaster Desk system and external computers

Operating the CardMaster Desk

Operating the CardMaster Desk is easy and safe. The CardMaster Desk complies with the CE regulations on mechanical, electrical and radiation safety, meaning:

- The system operator does not need special training on laser safety,
- The system operator does not have to wear any means for personal protection,
- No additional measures for the safety of persons in the environment of the system are necessary.

User interfacing

The CardMaster Desk system is controlled by the operator through a touch screen that is mounted on the system. The menu driven design of the software offers flexible and easy operation of the system. Menus are available in English and optionally in another language.



Figure 10 – The operator controls the system via a touch screen

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 the production. The CardMaster Desk system can produce multiple batches. All data belonging to a batch should be available on the host computer. Subsequently a few working procedures can be adopted:

- With Job Files
- With card identification (number or barcode reading)
- With a selected range of numbers

The operator has to log-on to the system via the virtual keyboard displayed on the touch screen. Operator log-on is secured by a password. Optionally, a fingerprint or smart card scanner is available. Several access levels are available (administrator, operator, service, IAI).

The CardMaster Desk system logs information of the processed cards, the operator log-on/log-offs and error messages that have been displayed. All data is logged on the system controller's hard disk and when a certain maximum is reached the oldest data is removed automatically. Such productions logins normally cover a period of approx. one month. All logged data can be retrieved from the system controller as files if needed.

The CardMaster Desk system offers following standard reports:

- Production overview report
- Card detail report
- Error message report

Operator handling

The operator handling consists of operating the user interface, placing and removing cards into the input and output tray. The CardMaster Desk is equipped with an (active) carbon filter, which has to be replaced from time to time.

Training and manual

An operator training and operator manual are part of the delivery. During the operator training the operators will be instructed how to operate the system and how to perform the first line maintenance activities.

Data sheet

A table with main technical data is given below.

Document specifications	ID-1 format (ISO 7810/ICAO 9303)
Electronic chip	Contactless: ISO 14443 compliant, type A/B Contact: ISO 7816 compliant
Software platform	Defined communication protocol
Resolution	600 dpi (standard), 450 – 1200 dpi (optionally)
Production rate	Up to 200 cards/hour, depending on application and configuration
Dimensions	56 cm (W) x 68 cm (H) x 94 cm (L)
Weight	80 Kg
Power connection	110 VAC - 240 VAC
Network requirements	UTP (100 Mbs) to host/encoding computer
Temperature	18-30 °C
Humidity	45-60 %

Table 2 – Technical data CardMaster Desk system

The CardMaster Desk platform is a versatile system platform. It can be customised in order to reach *almost* all project requirements. However much we strive to make the CardMaster Desk platform as flexible as we possibly can, there are some technical limitations with regard to the described functionalities though. You can find information about the margins and limitations in the further documentation, which is available on request. In order to prevent disappointment in a later stage, we would very much like to discuss the possibilities with regard to lay-out and production speed with you before placing your order.

Further documentation

More specific technical information is available on request. A list of topics on which we have documentation available is given below:

- Chip Encoding Interface
- Host protocol
- Verification specifications
- Example of operator manual
- Example of spare parts list

General remarks

The laser engraving quality depends among others on the materials used in the card. It is advised to produce some test documents, using the original cards in order to check if acceptable results can be achieved.

Engraving of specific materials may require additional filter or precautions. Such filtering or precautions are not part of the delivery and must be provided by the customer. The system is cooled by internal fans. Air from the CardMaster Desk is sent to the ambient environment and the customer must provide precautions to keep ambient temperature of the room at acceptable levels.

Special laser engraving features may be subject to Intellectual Property Rights (IPR) owned by third parties. Although the CardMaster Desk system is technically capable to apply these features, the procurement of the CardMaster Desk system does not grant license for the use of such features covered by IPR and licenses must be procured separately from the respective IPR owners.

The processing time of the cards depends among others on the amount of data to be encoded and engraved. Also the system can be delivered in various configurations to optimize the system to the desired throughput. Upon request, we can specify what performance can be obtained for your specific card designs and system configurations.



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