



Giesecke+Devrient

Convego® Issuance Partner:

A unified payment card issuance solution for all your personalization needs





Card issuance is a series of processes—we can help you manage these quickly and efficiently.

Ensuring safe, reliable, and efficient personalization of payment devices can be challenging. You need to consider:



The generation of customer data and keys for secure transfer to production machines.



Integrating your physical production processes with your digital estate for an integrated customer experience.



Creating and printing card carriers and PIN mailers in a secure and scalable way.



Undertaking the validation and testing of personalized cards to ensure processes and cards are working correctly.

Secure, modular, and scalable issuance solutions

Today's consumers expect fast, secure, and seamlessly integrated payment cards, configured to integrate with both their physical and digital lives. However, payment card issuance is complex, requiring multiple hardware solutions for physical production, security, printing, and personalization—coupled with sophisticated software for managing personalized data, cryptographic keys, and the overall issuance process.

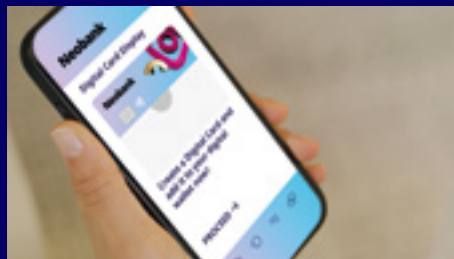
With personalization centers located around the world, Giesecke+Devrient (G+D) has many years of expertise in managing this process for more than 100 banking clients, personalizing over 400 million cards every year. Our complete portfolio of card issuance solutions covers every aspect of issuance, from card design, to data generation and validation, logistics, carrier and PIN mailer services, to smart digital solutions to enhance the card issuance customer experience. With our Convego® Issuance Partner solution, we can provide our clients with the same level of sophisticated management, securely deployed on their premises.

Convego® Issuance Partner leverages our total portfolio of card issuance and personalization solutions to provide a secure, scalable, and modular personalization solution.

As we have personalized millions of cards for hundreds of banks and fintechs around the world, you can rely on our experience and expertise to ensure every part of the issuance process works flawlessly.

The issuance process

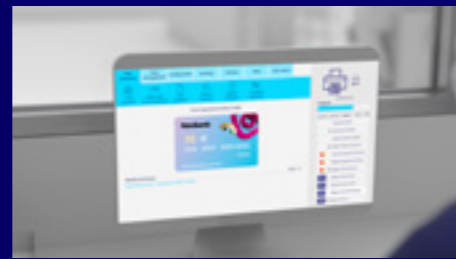
Below, you'll find the approach that our personalization centers take:



1. Digital: The customer onboards, and then receives a digital card display while their physical card is being created.



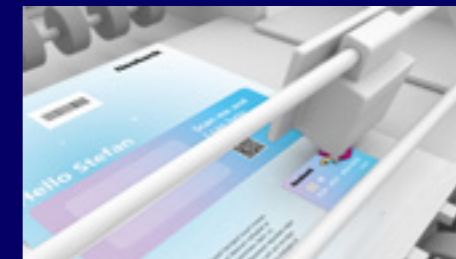
2. Request: The personalization factory receives a Request Entry from the bank. The process starts at this point.



3. Receipt: Our secure DMZ receives the order.



7. Production: The cards go into production—a multi-step process that includes: encoding magnetic strip, embossing or flat printing personalization details, and quality checks.



8. Card carrier: The finished card is then affixed to its pre-personalized card carrier, which is then sealed into an envelope before emerging from the personalization machine.



4. Assignment and data generation: The order is then transferred to the Production office, which carries out data generation to create EMV profiles, creating a job ticket.



5. Card collection: The blank cards are collected from the secure vault—and counted to ensure the correct number.



6. Production setup: The order is passed to the operator, who begins the production process.



9. Logistics: The envelopes are sorted for mail, boxed, and readied for dispatch.



10. Delivery: Following our secure loading protocol, the cards are dispatched to cardholders.

400_m

cards personalized every year

35₊

countries – G+D has a presence on every continent

The Convego® Issuance Partner solution

Convego® Issuance Partner from G+D draws on decades of expertise in card personalization to deliver a truly secure and scalable solution to manage all services around card personalization. Our modular, state-of-the-art solution offers unparalleled security throughout, validated by international payment schemes, local payment associations, and authorities around the world.

The solution is made up of multiple modules, each fulfilling a different task in the issuance process. This design enables our solution to accommodate any volume of card personalization, from a few thousand to millions of units, and to offer full scalability over time as your issuance processes mature.

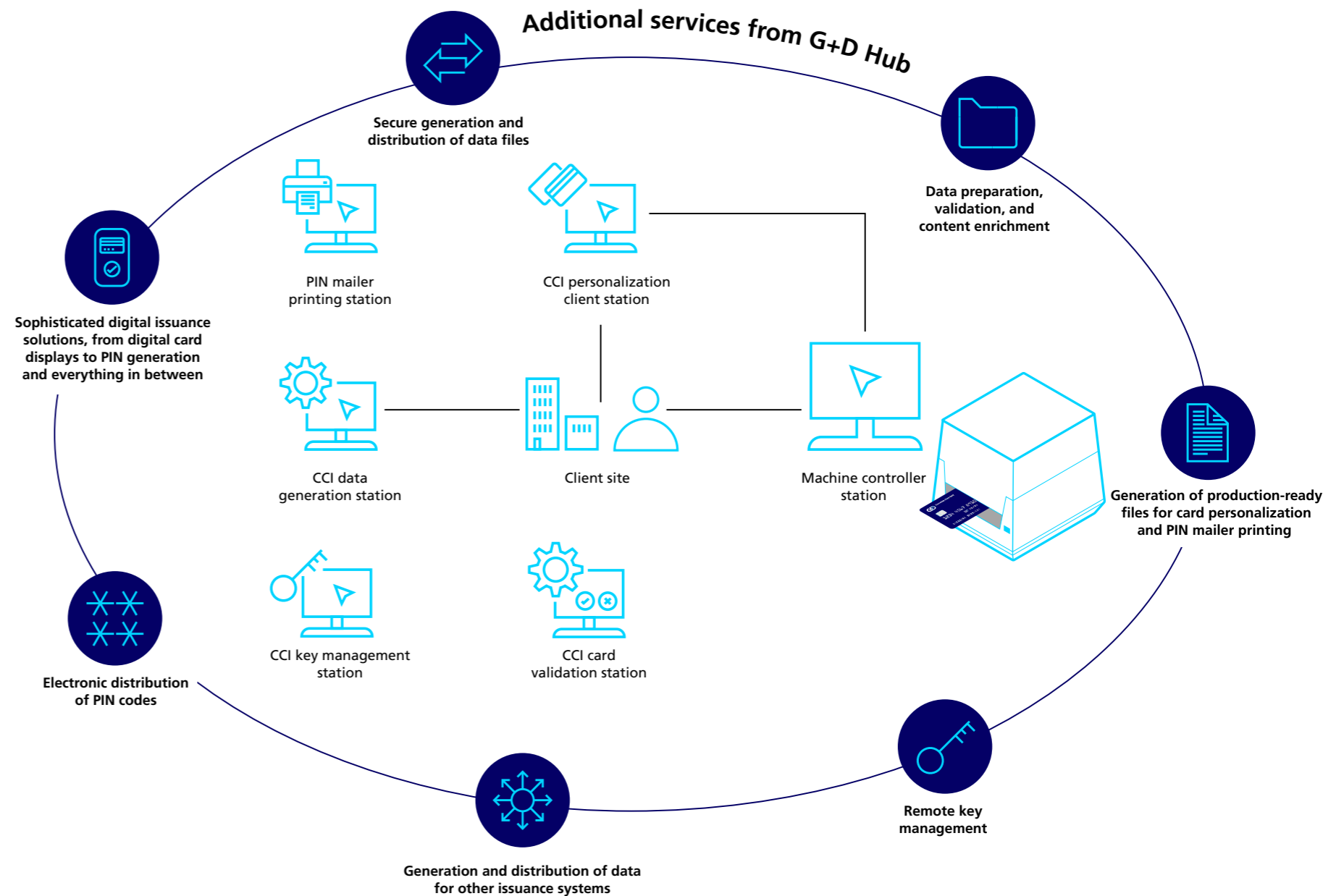
Although we do partner with selected suppliers, the solution is hardware independent, so we can introduce new, components, additional equipment or iterated production flows. It's so flexible that we can even support the personalization of cards supplied by other vendors, allowing us to tailor our solution to specific customer needs.

Whatever those requirements might be, G+D experts will select and adapt the best fitting Convego® Issuance Partner modules for the customer. We see ourselves taking care of the

full implementation from end-to-end, including management of the entire project, coordination with partners and external suppliers, configuration of products and services, delivery of all the equipment and components, onsite deployment, and training of users.

Once a complete Convego® Issuance Partner solution has been successfully deployed, G+D will take care of its maintenance, upgrade of components, assistance to users, and even the supply of consumables and spare parts through our online and onsite support services.

The diagram opposite shows the key components of the system, as well as the additional services that can be supplied from G+D regional hubs around the world to further enhance the solution and help our customers achieve excellence in card issuance.

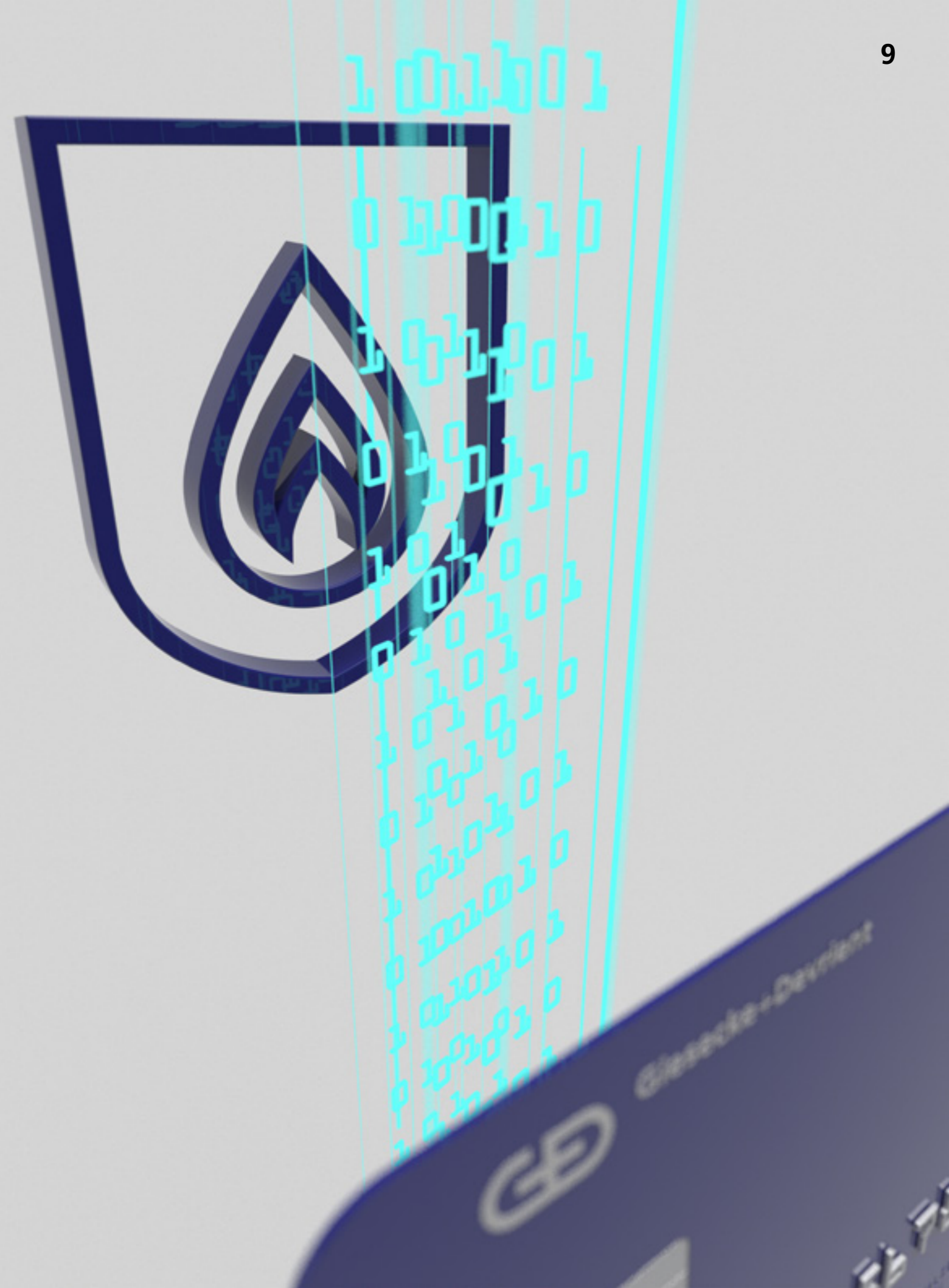
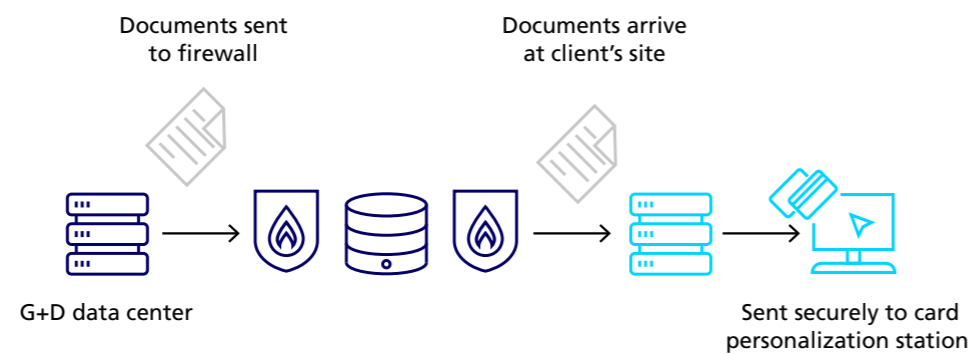


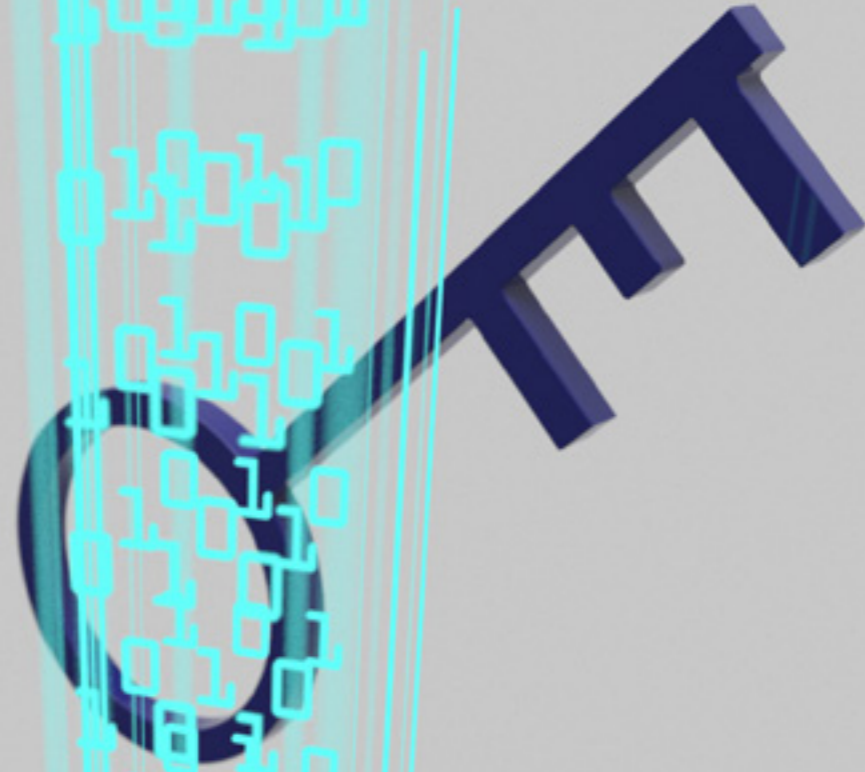
Card personalization station

This component of the Convego® Issuance Partner solution consists of a custom desktop computer with a hardware security module and dedicated communication ports. These integrate in a plug and play manner with the existing personalization environment and personalization machines.

The software is specifically configured to manage the card personalization process and includes specific applications for:

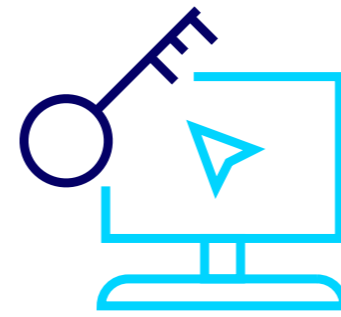
- Control of the personalization machine.
- Management of chip personalization profiles.
- Configuration and management of card personalization jobs.
- Secure processing of input data files.
- Logging of operation results and errors.
- Secure import and storage of production keys.
- Management of users and access rights.
- Personalization of chip cards according to the functionalities, layouts, and options agreed with the customer.





Key management station

Throughout all production processes, our top priorities are security, data protection, and data integrity. Our key management station ensures security throughout the entire smart card personalization value chain. Every step and every tool is secured through this solution—from receiving data from the data provider, to the final personalization and delivery of return or activation reports back to the issuer.



The Key Management Station (KMS) is used for generating, exchanging, administering, and distributing the keys required for every step of personalization within a high-security environment. The system supports the use of both symmetric and asymmetric keys generated using proven algorithms, such as:

- Triple DES.
- AES.
- RSA.

All sensitive information is handled or stored in hardware security modules, certified according to Federal Information Processing Standards (FIPS) requirements.

Administration of keys is always performed within a highly secure environment, protected in accordance with the latest security requirements of the payment associations and authorities, which regularly audit and certify tools and processes.

Did you know...

»G+D supports personalization centers in more than 35 countries—and has a presence on every continent.«

Data generation station

Generating the data to be personalized in a card can be complex. Our CIP FlexiGen solution, accessed through the data generation station, is designed to make this process easier.

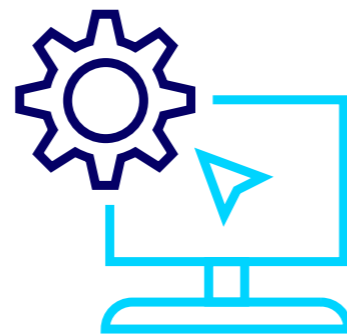
CIP FlexiGen can support any kind of card application, from payment and loyalty to access and authentication. It can:

- Handle any kind of input or output data file formats.
- Generate symmetric or asymmetric keys.
- Create key certificates or certificate requests according to payment scheme requirements.
- Provide data for third-party cards or third-party applications.
- Output data to be used by third parties.

All of the cryptographic operations take place within High Security Modules certified to Federal Information Processing Standards, so security and compliance are guaranteed. The solution also complies with Logical Security recommendations and mandates issued by the international payment schemes and local payment associations. The solution then works securely with the key handling station, powered by G+D's CIP Key Management System (KMS), to manage and administer keys securely and efficiently.

CIP FlexiGen can also be used to transform customer data. It can create personalization data files according to the EMV Common Personalization Standard format, using as reference a customer-supplied specification. CIP FlexiGen can also efficiently manage the generation of PINs, as well as personalization data for use in carrier and PIN mailer printing.

Multiple CIP FlexiGen processes can be operated at the same time, to balance the load in the personalization system. All CIP FlexiGen configurations can be easily transferred to a G+D personalization site to provide contingency or disaster recovery as a value-added service.



Did you know...

»G+D supports card issuance projects for over 180 different financial institutions around the world.«





Personalization station

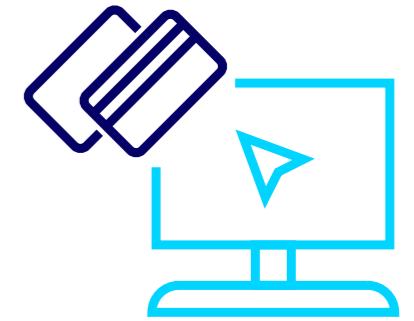
This part of the solution governs the actual production and personalization of the cards themselves. Drawing on over 20 years of expertise in the area of card personalization, G+D's CIP Universal Production Platform (CIP UPP) has proven to be a state-of-the-art, extremely efficient, and highly secure environment for card personalization.

Designed as a modular system, CIP UPP operates independently, without relying on specific personalization equipment suppliers. Its structure consists of a central framework, managing both machine and personalization applications. This independence guarantees quick adjustments to different personalization machines, smart card operating systems, and card applications—even those supplied by third parties.

Through the CIP UPP framework, the same application used in the personalization of one specific product can be used on all supported machines. The solution also enables one machine to use multiple personalization applications to personalize different products.

These features enable our partners to balance the daily workload according to our customers' and SLAs. It also provides the needed flexibility to cope with unexpected requests, such as the personalization of an urgent VIP card.

The CIP UPP system powers the whole personalization process, including quality inspections and log reporting. As with the other parts of the CIP solution, UPP is connected to our CIP KMS and makes use of FIPS-certified High Security Modules to perform cryptographic operations and manage all sensitive data. Configurations for all the UPP components can also be easily and quickly shared with G+D. This streamlines implementation, deployment, and the testing of business contingency plans.



Did you know...

»G+D personalizes over 400 million payment cards every year.«

PIN mailer printing station

Producing PIN information for your customers is a crucial component of the card issuance process. This sensitive information must be generated and managed securely, to prevent fraud. In addition, sensitive information needs to be distributed to customers in a tamper-evident way to reassure them that their data, and their money, remains safe.

This component of the CIP consists of a customized desktop PC, which includes a Hardware Security Module and specific software applications, designed to:

- Design and manage printing layouts.
- Configure and manage printing jobs.
- Securely process input data files.
- Log operational results and any errors.
- Securely import and store production keys.
- Manage users and access rights.
- Print PIN mailers to the layouts and options agreed with the customer.

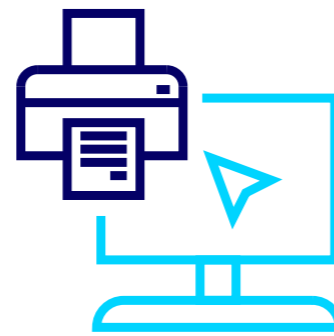
The station is a completely autonomous offline printing client equipped with all the hardware and software required for securely managing PIN values and printing them onto mailers. This includes:

- Key management.
- Administration of users.
- Logging.
- Job/batch management.
- Handling of remake process.

The printing solution is optimized to use laser printers, with paper sheets containing tamper-evident panels or labels to keep the PINs confidential.

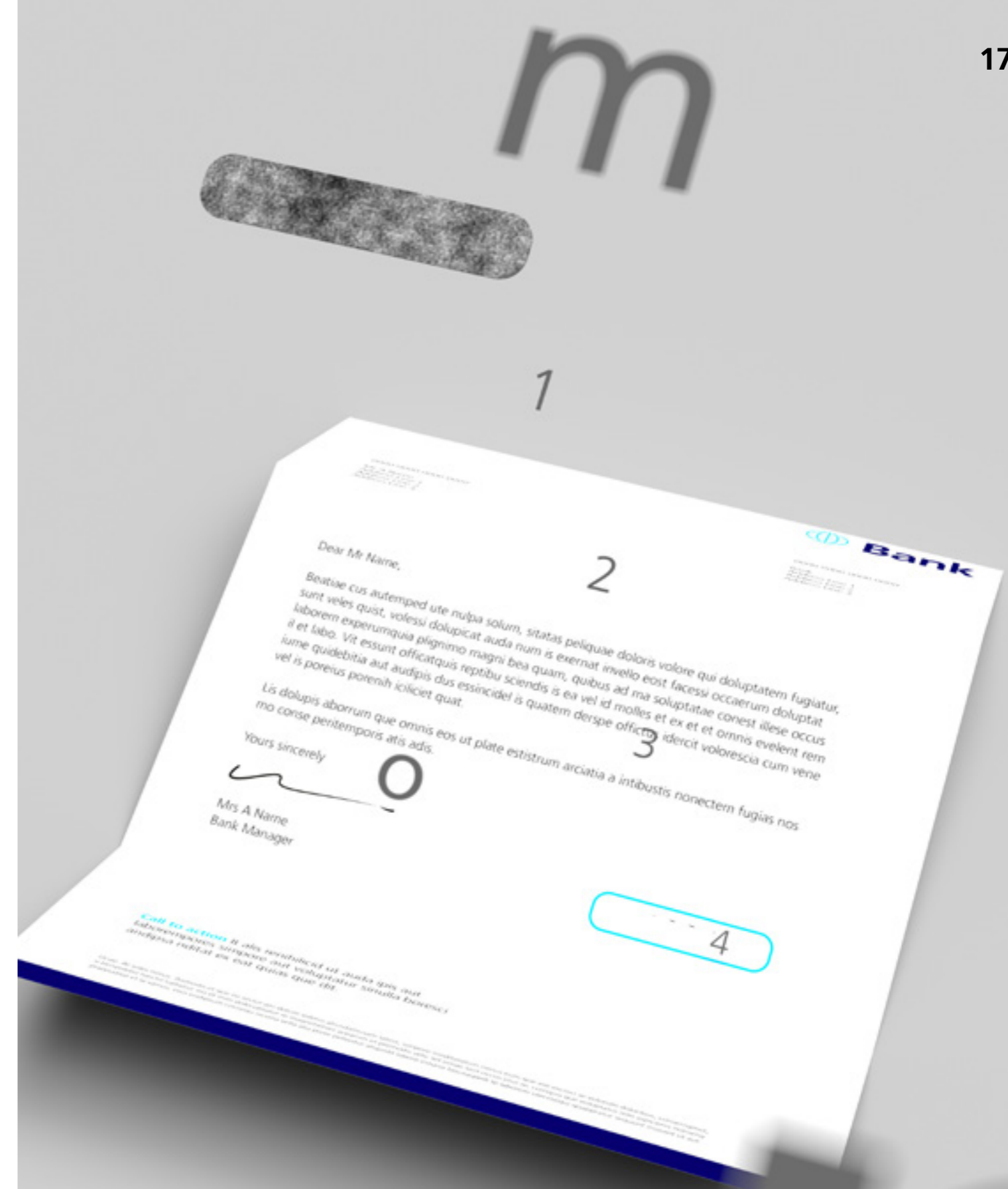
Additionally, the printing station offers:

- Use of laser printers calibrated according to printing layouts and types of paper.
- Support of any paper containing laser-printable security labels, for example PINTab, Hydalam, or CS3.
- Fully configurable printing layouts and backgrounds which can be completely individualized.
- Pre-visualization of composed printable images for validation.
- Sanitization of already processed files.
- Localized menus and messages.



Did you know...

»As a card vendor, G+D manages over 180 different services for our clients.«



The PIN printing process in detail

PIN mailer printing input data is generated at a certified G+D data center after the card has been personalized.

In addition to cardholder names and respective addresses, input data files contain individual PIN values securely encrypted with a transport key.

At the same time as generating the printing data, the solution produces customized PDF files containing the printing background and XML files defining the printing layout. These files can be completely individualized according to the customers' needs.

All input data, background, and layout files are packaged within an encrypted archive file and securely transferred to the remote location where the PIN mailer printing equipment is installed.

Once decrypted, printing files are processed by the PIN printing station to generate a pool of printing jobs.

After secure authentication, operators individually select and run jobs from the pool. All tasks are guided by the printing software, making the whole process easy to follow.

During printing, individual PIN values are securely decrypted inside the High Security Module, injected into the printing files, and immediately sent to the printer.

Upon completion of a printing job, remakes of individually selectable records can be run with authorization from a supervisor.

At the end of the whole process, a summary of all operations will be generated for auditing purposes.



Security and compliance by design

The solution fully complies with Payment Card Industry Security Standards (PCI) regulations and international payment scheme mandates:

- Each station is individually equipped with a FIPS-certified High Security Module.
- Sensitive data is securely managed according to ISO 9564.
- PIN mailer data generation and printing takes place after the card has been personalized.
- Printing station functions require authentication and are monitored.
- Re-runs of printing jobs require authorization.
- Supported mailer materials are tamper-evident.
- Each station manages its own printing jobs and the stations do not share configurations.
- Printable data is strictly limited to that required for PIN mailer delivery.
- Transport keys are securely exchanged and stored.
- PIN data is always kept encrypted until the final moment of printing.
- The printer is directly attached to the CIP PMPS station to eliminate the risk of interception.
- Generation of reports for audit controls.

Card validation

The CIP card validation station is a complete sophisticated testing and card validity checker. Users can define and run testing scenarios to check whether cards have been personalized correctly, or validate personalized cards to ensure they meet the specifications laid out earlier in the process.

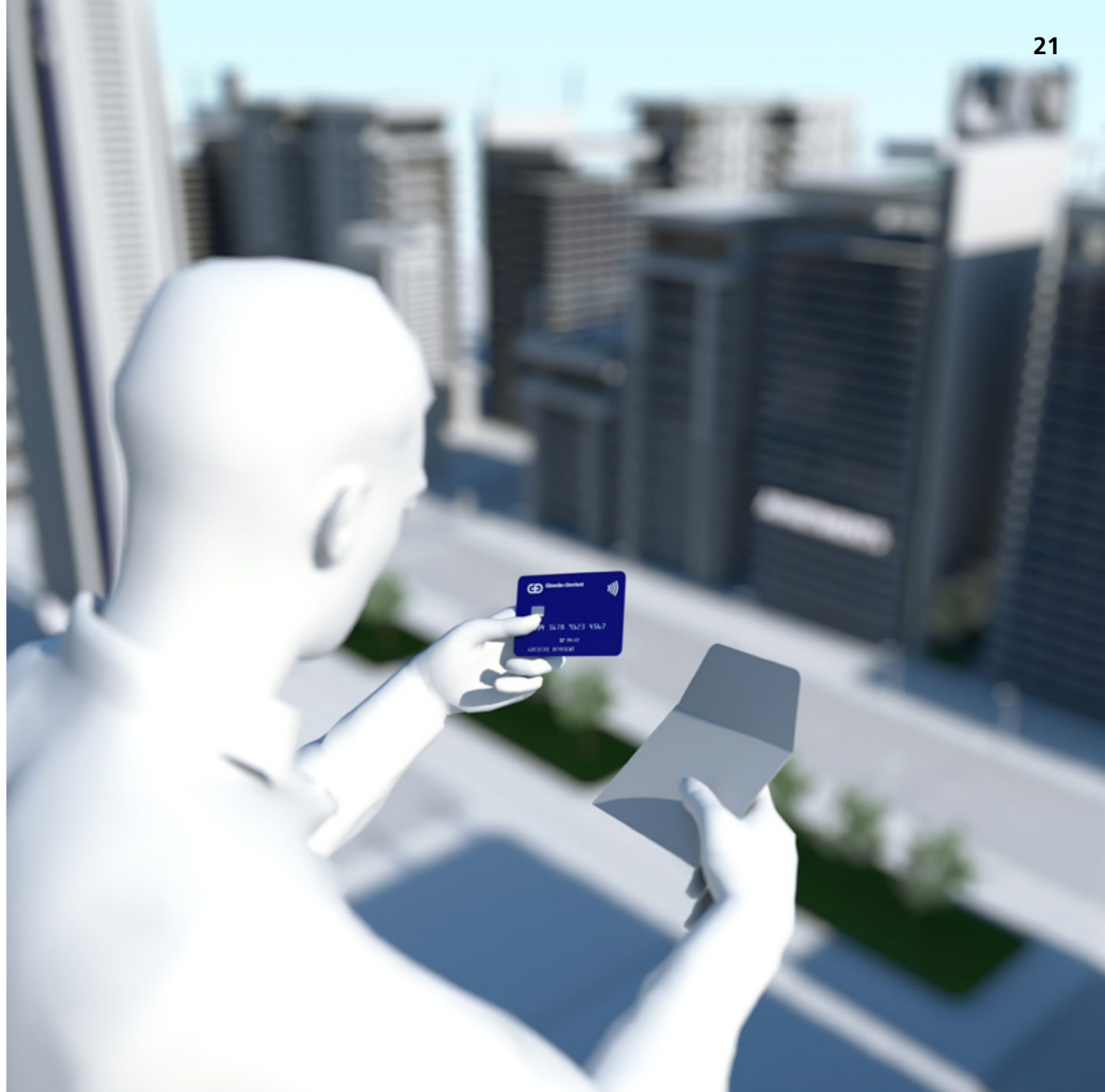
This is a customized desktop PC, including a dual interface card reader and specific software applications to manage:

- Definition and management of testing scenarios.
- Logging of operation results and errors.
- Management of users and access rights.
- Validation of personalized cards according to the functionalities, layouts, and options agreed with the customer.



Did you know...

»G+D has been working with payment technologies for over 170 years«



Smart services for added value

Further complement and enhance the Convego Issuance Partner solution by connecting to the Convego® Connect (API) hub with the following additional services—provided by G+D.

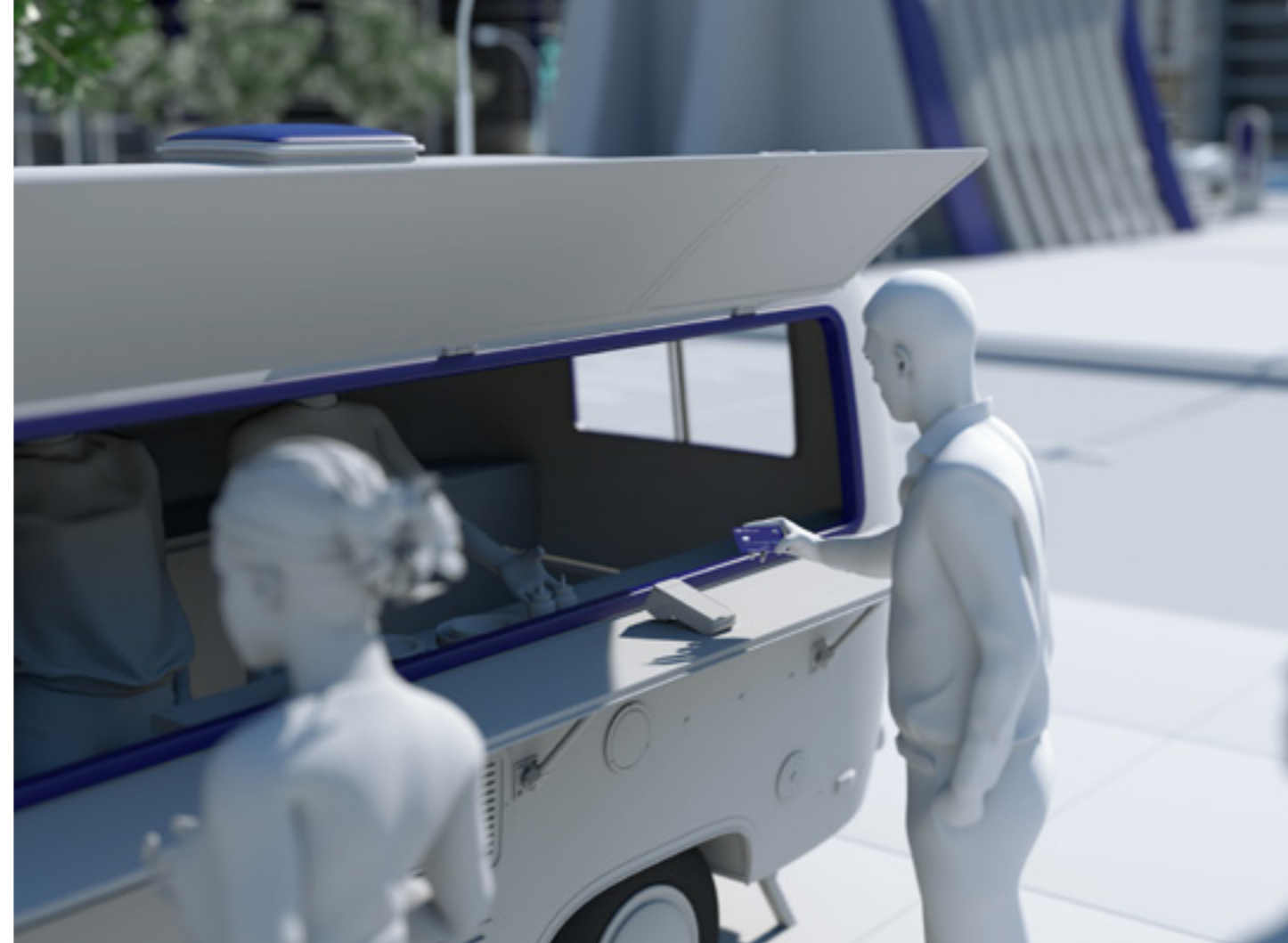
To enhance the CIP solution, customers may request that G+D deliver some of the specialized data processing tasks involved in card personalization. These are time and resource intensive processes, such as:

- Data preparation.
- Content generation.
- Formatting of production-ready files.

G+D offer single points of data delivery to issuers who want to centralize all the data management activities for their branches worldwide. G+D can also accommodate receiving cardholder data from different countries to a central G+D hub. File transmission is securely carried out using the most common protocols, such as ISDN, FTAM, sFTP, X.25, and HTTP with secure layers. We can also process other protocols or communication channels on request. Handling of customer data files takes place in high-security environments, with robust processes in place to manage identity,

verification, and content validation for all formats of customer data. As an additional service, data can be enriched, or additional data generated, to meet specific functionalities required by the customer for personalized card or wearable applications.

Production-ready data can be delivered to any location and entity through multiple channels. Whether the content is personalization data for a card, an SMS message, a print-ready file, or commands for an applet loaded into a mobile device, it will be provided in compliance with the finest security standards. Once the customer data files have been personalized, activation, return files, or production reports are sent back to the issuer using the same channel.

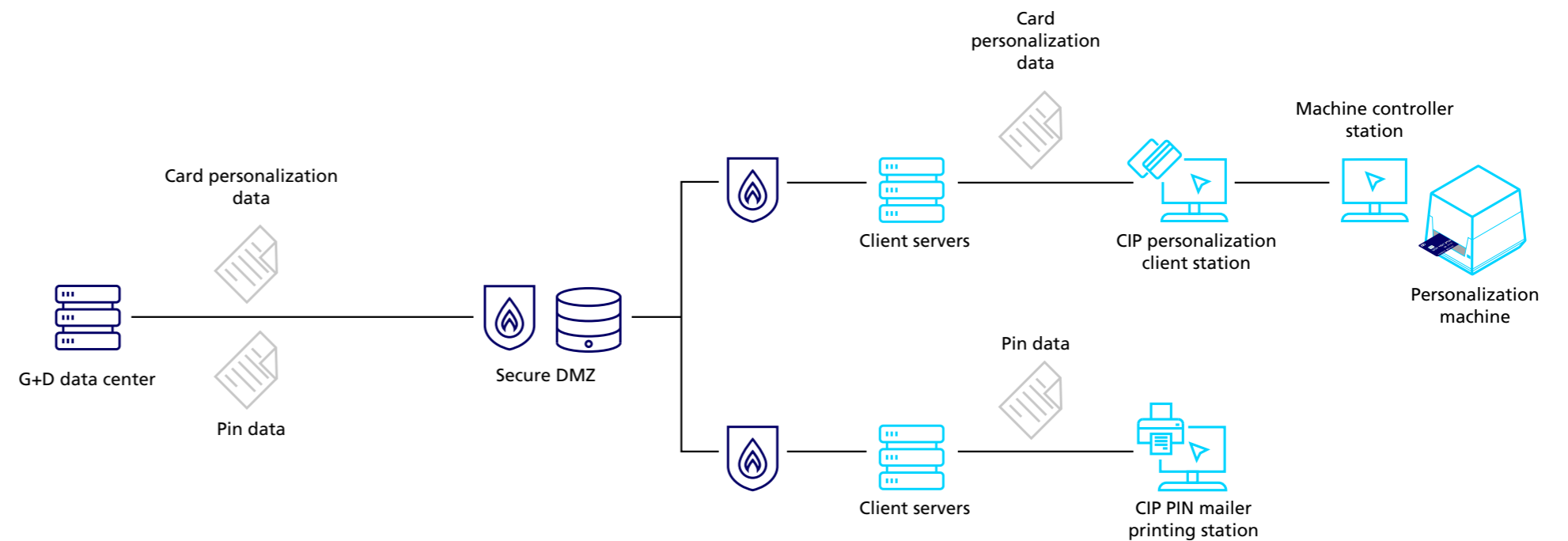


Backup and contingency

All the hardware and software components deployed onsite as part of a Convego® Issuance Partner Solution are the same as those used by the many G+D card manufacturing and card personalization sites around the world. These sites process millions of cards each year so robustness is built into the entire solution.

This also means that any specific configuration in use by a customer can be shared with any G+D site, where processes for data generation and personalization can be replicated in a fast and secure manner, implementing business contingency plans in the most efficient way.

As part of the service, G+D will store and manage emergency stocks of cards and related fulfillment materials which might be required in case of the activation of a contingency plan.



Why choose G+D as your perfect issuance partner?

Drawing on its over 170 years of passion for payments and payment technologies, and its experience of card issuance for over 180 banking institutions located on every continent, G+D is the perfect partner to support your on-site card personalization needs. Our set of sophisticated, modular solutions are completely scalable. Whether you're producing thousands of cards, or millions, G+D can help.

Deploying card personalization services in-house can be a time and resource intensive procedure, but with G+D's experience and expertise, this challenge can easily be overcome. Our solution is configurable, flexible, and modular, so you can quickly and effectively tailor CSCI to your requirements—only using the services you need. This can help to reduce your time to market.

G+D production sites worldwide use the same tools and components included in the Convego® Issuance Partner solution, so configurations can be shared seamlessly from site to site. This is extremely useful for business contingency planning, whether it's required due to peaks in regular business activities or disaster recovery efforts. This means that you know you can rely on our solution to deliver, every time.

With CIP, you don't only gain access to a complete set of end-to-end card personalization solutions, but also the sophisticated range of technologies and solutions that form part of our card issuance portfolio. This can include: secure and off-site preparation of PIN mailer and customer data files, sophisticated integrations with wearable tech, digital wallets, and carrier inserts—to name just a few of our offerings.

We offer our clients full support from expert installation and setup support, to in-life management support and guidance. This support also extends to disaster recovery and contingency planning. As our own production sites use the same technologies that are used in CIP, we can seamlessly and securely take over your card issuance jobs in case of emergency. We can even hold a stock of emergency cards and PIN mailer materials, so your SLAs and deadlines are never under threat. No matter how complex your card issuance processes, or how demanding your

requirements, our winning combination of technological solutions and true card issuance expertise means that we can help to transform your card production processes quickly, efficiently, and effectively. Our expertise, market know-how, and the size and scale of our operations mean that we are your perfect, reliable issuance partner.

35+

countries



About Giesecke+Devrient

Giesecke+Devrient (G+D) is a global SecurityTech company headquartered in Munich, Germany. G+D makes the lives of billions of people more secure. The company shapes trust in the digital age, with built-in security technology in three segments: Digital Security, Financial Platforms and Currency Technology.

G+D was founded in 1852 and today has a workforce of more than 14,000 employees. In the fiscal year 2022, the company generated a turnover of 2.53 billion euros. G+D is represented by 123 subsidiaries and joint ventures in 40 countries.



Giesecke+Devrient

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