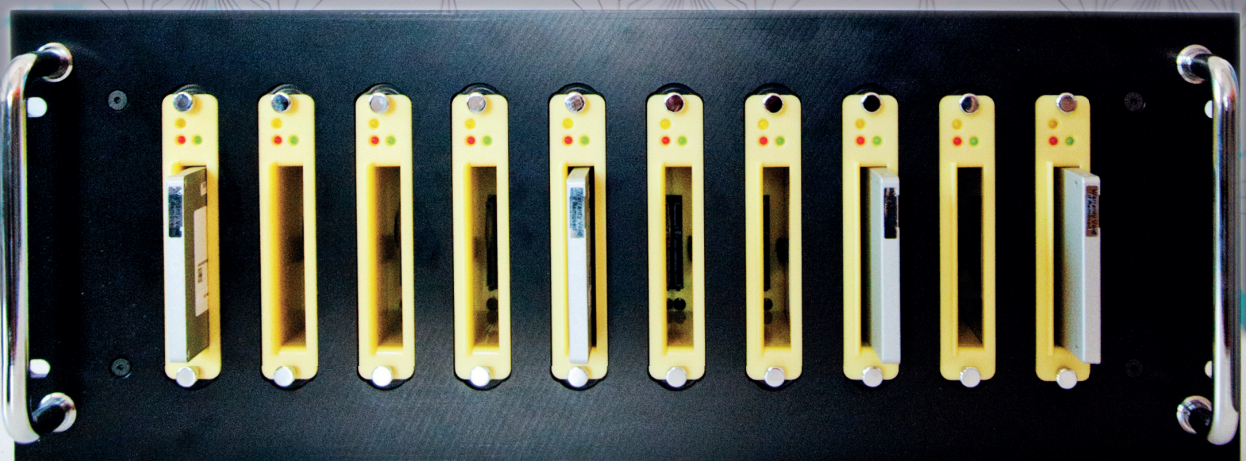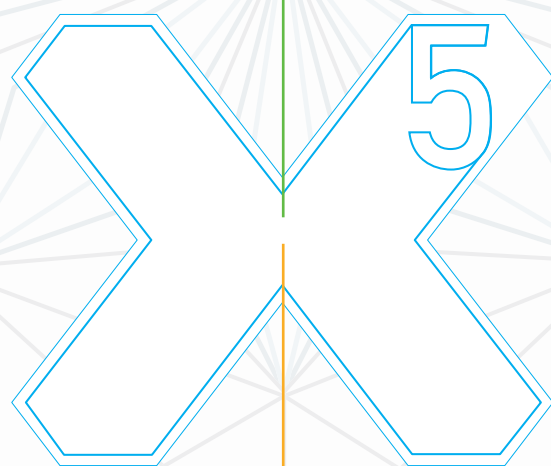The first copy system that keeps track of which data is stored at which location on which media at which time.
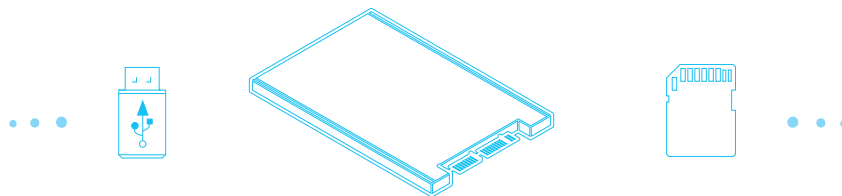
X
NET
TECHNOLOGIES

X⁵ COPY SYSTEM

X⁵

COPY SYSTEM

X-NET / X⁵ is the only storage media production system able to simultaneously copy individual data onto 80 SSD, USB, CF etc. Just in time copy technology reliably ensures the availability of the right storage media at the right time and place.

UNINTERRUPTED COPY PROCESSES

Every single one of the up to 80 slots is used asynchronously and records data on different storage media (SSD, Cfast, CF, USB, SD etc.) at up to 150MB/s. Faults (e.g. defective data carrier) are displayed immediately. After removal of the defective data carrier or insertion of a new data carrier, the affected recording process is continued automatically. In the mean time, all other slots are still working without any impact.

After each copy process, the data is verified for enhanced security. Recording of special security devices e.g. dongles or special media from the customer is provided.

SIMPLE HANDLING

X^5 is controlled with the connected monitor and keyboard or over web interface (e.g. tablet PC). LEDs at each SATA slot display the status of the production.

The flexible interfaces and adjustable software plugin mechanism of the OpenRC framework facilitate optimal integration of the X^5 copy system into a company's work flow, e.g. through linking with central ERP or PPS systems.

SUSTAINABILITY

The X^5 copy system is the most flexible storage media management system on the market. The use of adapters enables the simultaneous storage of data on various media types or on media sets. This ensures that the X^5 can be geared up for future generations of media.

X^5 copy systems can be extended with additional features and modules subsequently. Long term availability of components and spear parts ensure a long life time of X^5.

VARIOUS MEDIA
INDIVIDUAL
SECURE
JUST IN TIME
SCALABLE

5 FEATURES OF THE OPTIMAL DATA STORAGE MANAGEMENT SOLUTION

SECURE

Each data carrier can automatically be recorded with unique data (e.g. encryption, individual software key). **This allow highest security standards as each mass product is delivered with customised software.** If one gets hacked, the other products of the same series will not be leaked, too, as only individual items are affected.

INDIVIDUAL

X^5 automates the production of 1:1 copies integrated in the environment of mass production. Before the actual copy process starts, X^5 pools data together from different sources (e.g. file server, data bases, ERP, PPS) and prepares data individually for one (1:1) or many (1:n) data carriers. Various data preparation processes (e.g. document production, matching of data, encryption, video formats) are supported.

JUST IN TIME AND ASYNCHRONISM

Recording (and validation if required) of data take place asynchronously. The copy process starts immediately after insertion of a data carrier and/ or all information concerning the product is available in the centralised data storage and/or in a time interval that allows timely finishing. Idle periods while loading or unloading X^5 are reduced to a minimum. Reliability is increased as faulty copy processes are taken over through other slots immediately. Clustering of (de-centrally located) X^5 systems enables peak production. **Data carrier are recorded on demand and contain respective data assigned to different products.** Each slot indicates completion individually and can be assigned to the corresponding product accurately.
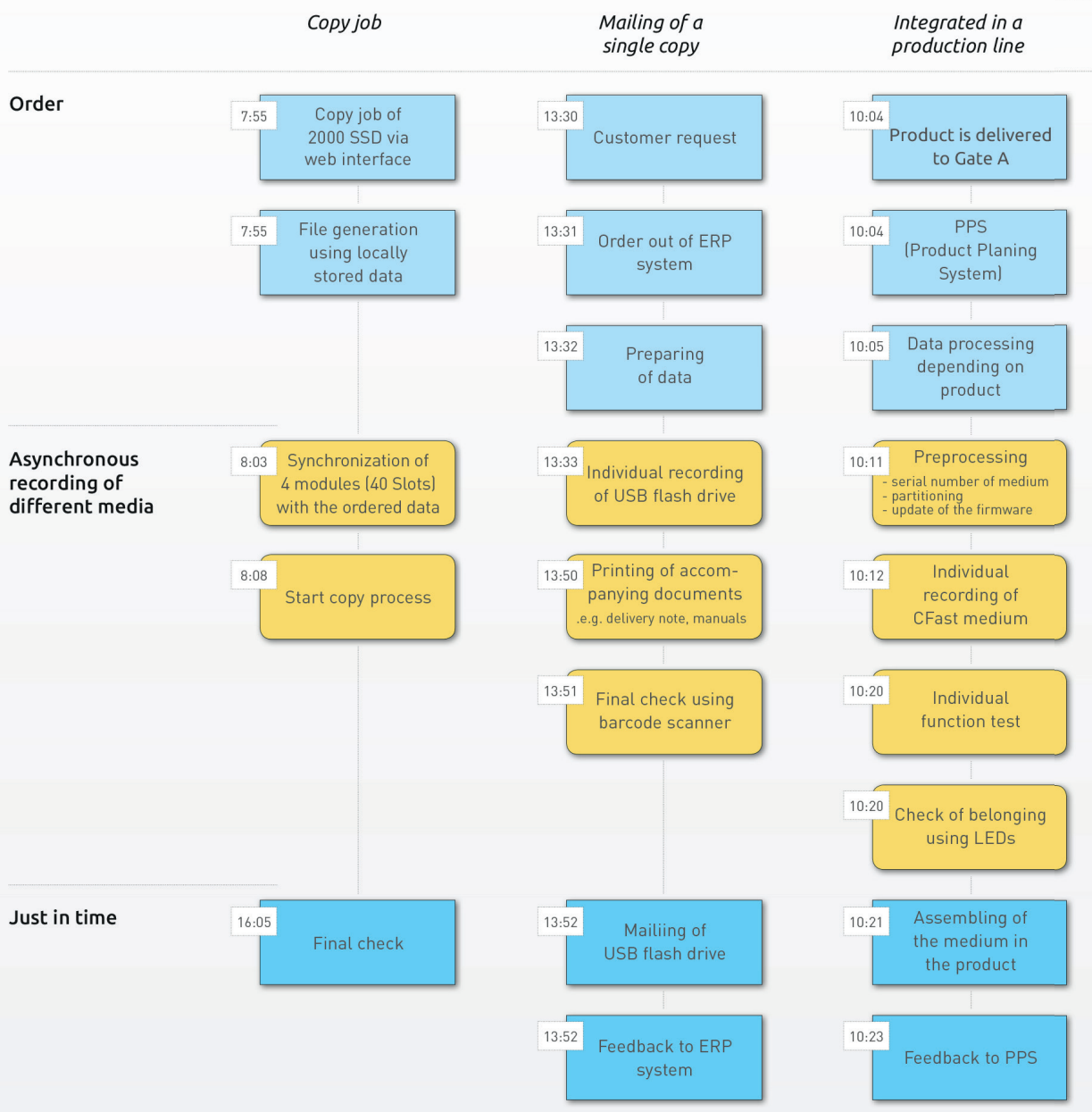
VARIOUS MEDIA

Recording on different types of data carrier happens parallel through using adapters and/or various modules. The system automatically recognises the type of medium and starts the defined recording process. Media sets can be recorded in one working process.

SCALABLE

Hardware and software are designed modularly. The number of recording modules can be adjusted according to the required throughput and data volume. **Later extension of additional modules is possible.** Recording jobs can also be distributed among several X^5 systems, a clustering of X^5 systems is supported.
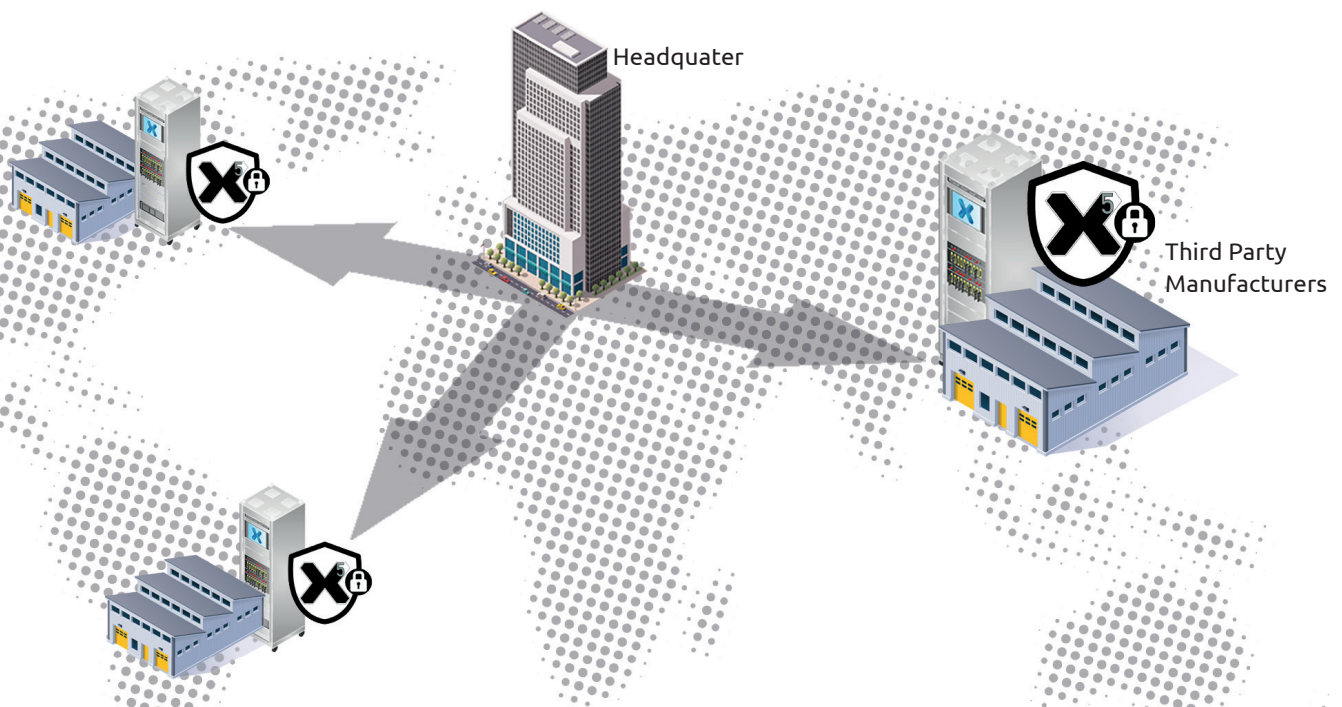
One system – Many possibilities. Customised for your requirements, X⁵ can be used for a variety of applications where any type of individual physical media is needed. The work flow shows three processes that are parallel carried out with one X⁵ system.

	Copy job	Mailing of a single copy	Integrated in a production line
Order	7:55 — Copy job of 2000 SSD via web interface	13:30 — Customer request	10:04 — Product is delivered to Gate A
	7:55 — File generation using locally stored data	13:31 — Order out of ERP system	10:04 — PPS (Product Planing System)
		13:32 — Preparing of data	10:05 — Data processing depending on product
Asynchronous recording of different media	8:03 — Synchronization of 4 modules (40 Slots) with the ordered data	13:33 — Individual recording of USB flash drive	10:11 — Preprocessing - serial number of medium - partitioning - update of the firmware
	8:08 — Start copy process	13:50 — Printing of accompanying documents .e.g. delivery note, manuals	10:12 — Individual recording of CFast medium
		13:51 — Final check using barcode scanner	10:20 — Individual function test
			10:20 — Check of belonging using LEDs
Just in time	16:05 — Final check	13:52 — Mailiing of USB flash drive	10:21 — Assembling of the medium in the product
		13:52 — Feedback to ERP system	10:23 — Feedback to PPS

FIT FOR INDUSTRY 4.0

X^5 copy systems are designed to support customised workflows and copy processes tailored to our customers' specific needs. Application ranges from automatic storage of individual product-specific data to Just in time production and simple copy processes. When implementing a storage process we consider and incorporate your entire production workflow and adjust the X^5 copy system to your specific needs.

The combination of software and hardware components allows individualisation of security strategies. X^5 enables the production of 1:1 copies in-line or outsourced to third party manufacturers and the integration of secure life cycle management strategies.

Headquater

Third Party Manufacturers

X^5 is designed to handle the complex requirements of producing companies and is network-compatible. It records the data on the corresponding data carriers and verifies it. Further on, X^5 supports authentication processes and makes use of secure communication tools.

The standard version **X⁵ Basic** enables in-line duplication of data carrier (e.g. SD, microSD, CF, Cfast, USB, SSD, M.2) and of media sets combining several types of data carriers. Standardised interfaces automate the production work flow, allow the connection to several data sources and provide quality control functionalities.
High level encryption is supported, especially in combination with the use of special types of data carriers, recommended by X⁵.

X⁵ Consulting includes the analysis of production and products to identify individual security strategies and tailor-made solutions. In a series of workshops focussing on security and on software replication for products, the current situation in the production environment is analysed. The results are summed up in a written recommendation provided to the consumer. The enabled know how transfer helps customer to develop in-house security strategies.

X⁵ Advanced consists of X⁵ Basic supplemented through customised software and/or hardware. Product-specific and unique encryption for products and secured communication in production increase the security level significantly. Customer work flows are considered and solutions are designed to increase automation in production and service, to enable higher flexibility (e.g. covering output peaks), to provide logging and traceability functionalities and to save costs through just in time production and reduction of production time.

X⁵ PRODUCT AND SERVICE RANGE ❯ PERFECTS YOUR WORKFLOW

X⁵ Basic

» uninterruptible copy process

» simple handling through LED signals

» graphical user interface

» writing speed of up to 150 Mbyte/second

» convenient for various types of media

» support of encryption mechanism and logging

» expansible and scalable

X⁵ Consulting

» analysis of security & strategy

» identification of risks and chances

» identification of resources and environments to be included

» identification of interactions during product life cycle

» conception of individual solutions to secure products and productions (e.g. copy protection, update and service strategies, data security)
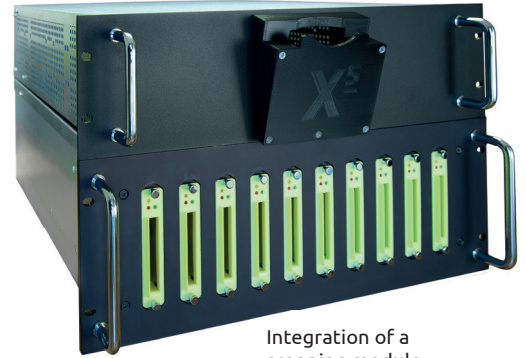
» concepts for customised solutions

X⁵ Advanced

» supply of individual solutions

» customisation of each produced data carrier and each software distribution

» security of the product is ensured, also for future applications

» production corresponds highest security requirements

» development of customised and individual micro controller

An X⁵ System can be equipped with up to 8 (different) modules.

Integration of a scanning module.

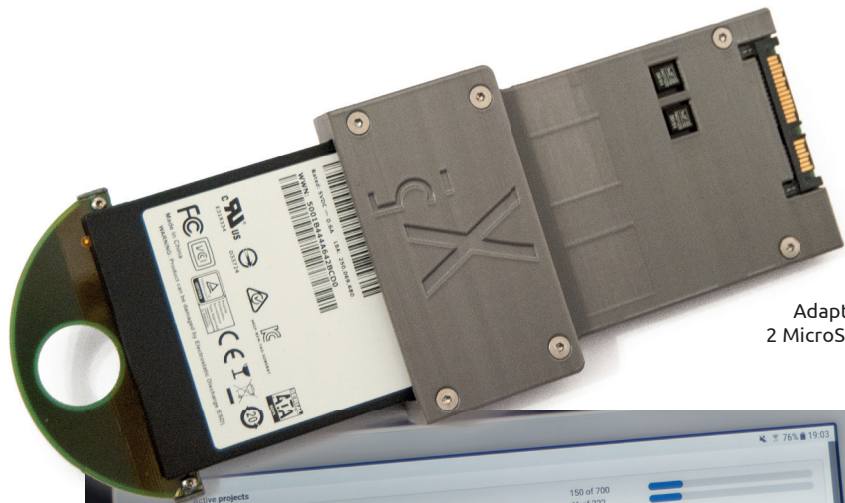The standard version X⁵ Basic is equipped with at least 2 modules, monitor and server.

TECHNICAL SPECIFICATIONS

19" copy module	
Number of Slots	10
Max write speed per slot (asynchron)	150 MB/sec
Base Interface	SATA – 2,5"
Media types	2,5" SSD / 2,5" HDD / CF / Cfast / USB / SD / Micro SD
Replacement frame	slots, modules and wear parts can be replaced during operation
Software	X-Net OpenRC Framework
Copy System	
Max. number of copy modules (per X⁵ System)	8
Display	19" touch-screen
Size of control server	1 RU-Server
UPS	19" Rack-mounted
19" rack	WxDxH 600x600x2000 (w/o wheels)

Adapter for 1 SSD and
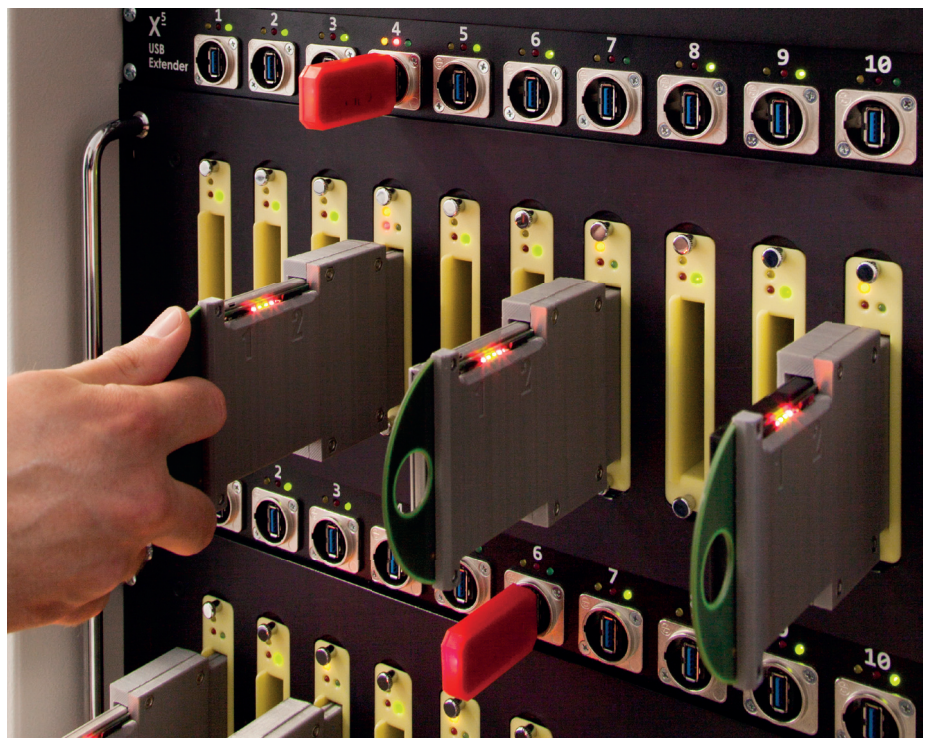2 MicroSD in a media set.

SOFTWARE

The OpenRC software framework offers flexible interfaces which enable easy linking of different data sources, copy jobs and upstream or downstream processes. The storage of data can be adjusted via customised workflows and processes according to customer needs. Signal lights and an overview screen on your monitor display the current production status in real-time, allowing operation by responsible employees. Three areas are available for controlling and monitoring the X^5:

X Optimized operation via touch-screen: the monitor is located directly on the copy station and provides detailed information regarding each slot such as progress bars, process ID, error messages etc. Each control unit is equipped with a touch-screen.

X Web-interface: the copy station can also be accessed and operated via a web browser. This allows copy processes to be monitored and controlled via various mobile devices such as Tablets or Smartphones as well as any conventional PC or laptop.

X Via software interfaces (XML, REST) all functions of the copy station as well as process status can be accessed and controlled by third party systems.

Plugins for pre- and post-processing: workflow-specific plugins can be executed before, during and after the copy processes, allowing e.g. storage media to be analysed, formatted and their firmware to be upgraded.
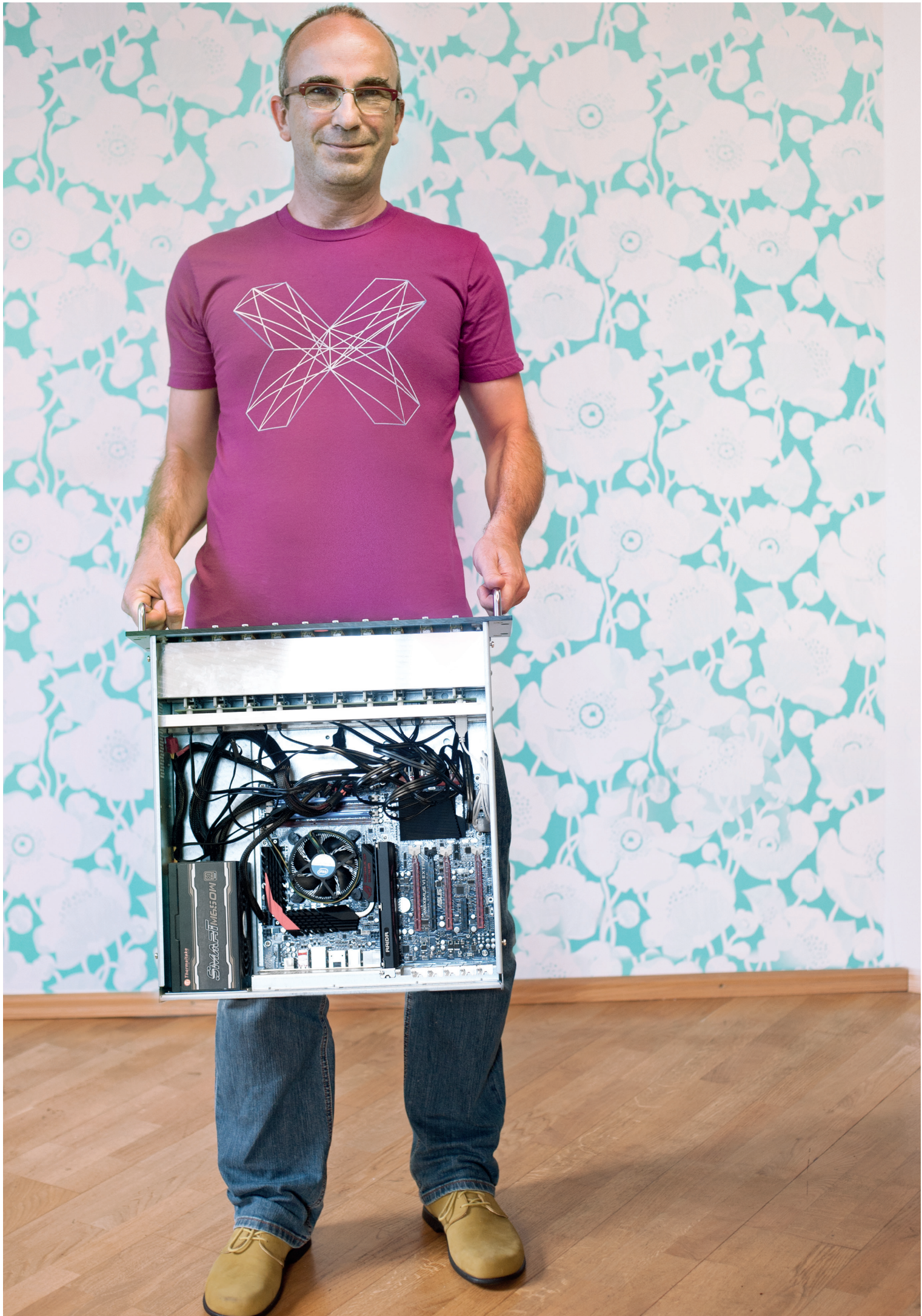

Control of X5 using the graphical user interface on a mobile device.

Each single USB and SATA slot displays its status with signaling LEDs.

"The art of reproduction – every piece a singleton – Andy would have loved our copy system."
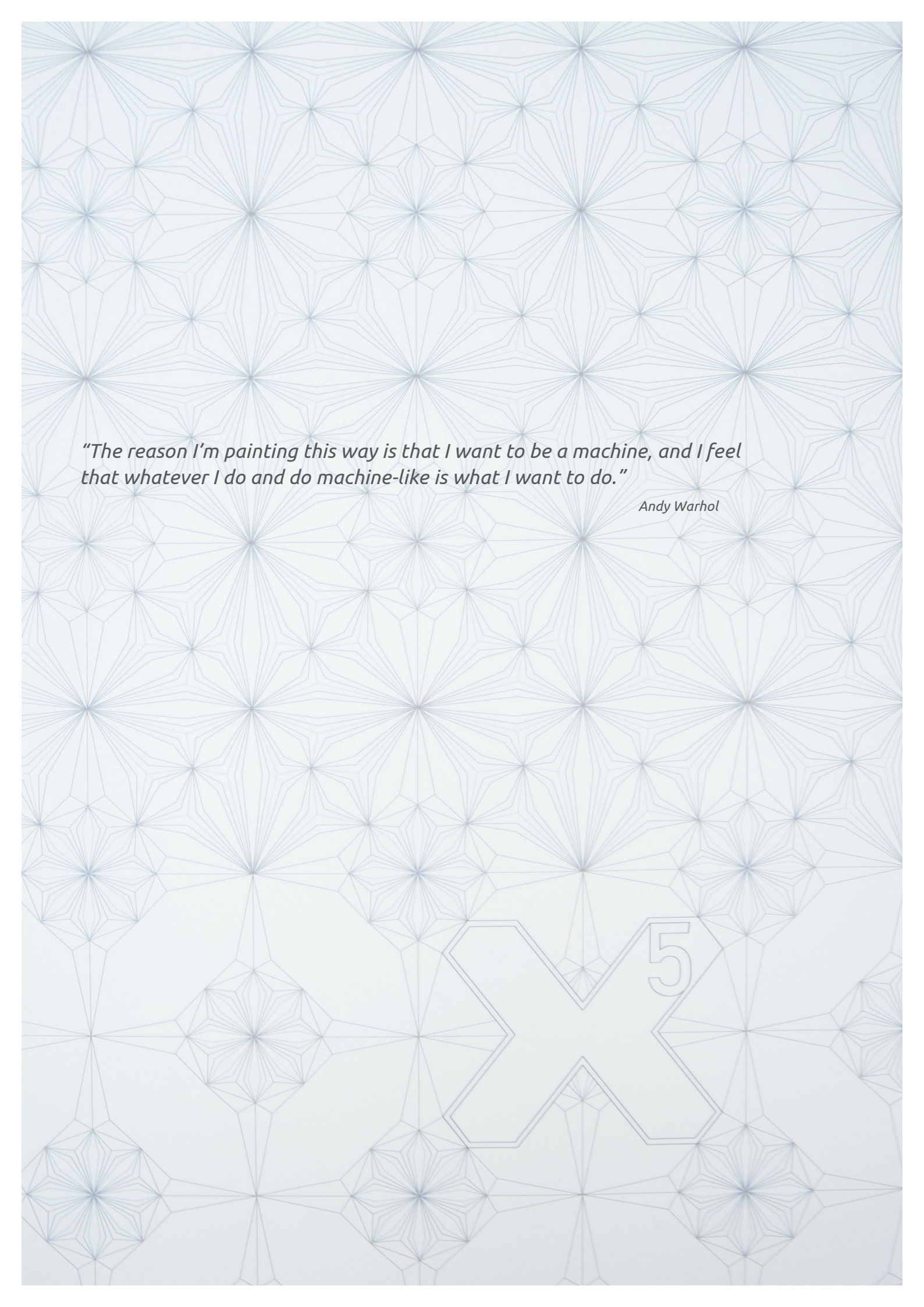
Nikolaus Dürk

"The system is designed for flexible use and not only allows asynchronous single unit production but also the use of various storage media. In this way the workflow can be retained over several media generations and operations can run parallel."

Katharina Kloiber

"Our production process requires a continuous production. Disruptions can be solved while the process is ongoing. Wearing parts such as copy slot modules can be replaced during operation. Other copy jobs on the same machine aren't affected."

Wolfgang Eibner

"The reason I'm painting this way is that I want to be a machine, and I feel that whatever I do and do machine-like is what I want to do."

Andy Warhol

"The system is designed for professional use. As a system integrator with more than 10 years of experience, the development process of the SSD copy system was supported by and able to build on a wealth of experience and comprehensive knowledge in the field of on-demand and Just-in-Time product-specific single and mass production."

Roland Lehner

X-NET develops copy systems for optimal support of customer-specific workflows and processes. Products range from automatic media storage solutions (USB, HDD, SSD, SD, CF, CD, DVD, BD etc.) and Just in time production systems to simple copy processes. When implementing a copy process we take the customers' entire production workflow into consideration and adjust the copy system exactly according to your needs.

X-Net Technologies GmbH is located in Linz, Austria, and specialized on the implementation of special-purpose solutions.
X-Net realizes projects that e.g. deal with just-in-time production or with the mass production of individually recorded data carriers. The high expertise results from the extensive technical knowledge in the area of IT infrastructure and network engineering as well as the know how, which was acquired since the foundation of X-Net in 1999.

The team of X-Net realizes the conceptual design and the implementation of special-purpose solutions and provides high-level support for the installations which can be done completely remote or on-site. When developing and implementing new solutions and customized plug-ins, X-Net uses open source components to reach a high-grade autonomy.

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