KVM solutions

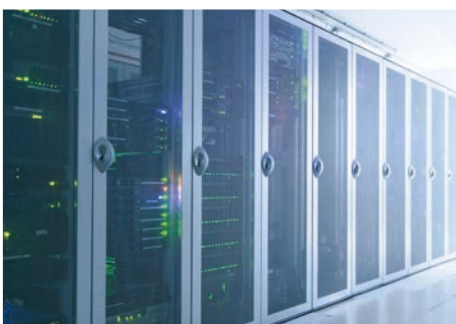
More Safety and Efficiency for:

Control rooms

Air Traffic Control Center

Towers and Remote Towers

Baggage Handling



G&D IF IT'S KVM

G&D IF IT'S KVM

Guntermann & Drunck is regarded as one of the leading manufacturers of KVM products for control room applications in air traffic control and baggage handling, for maritime applications, applications in the broadcast sector and in industrial automation and process control.

With many years of experience and a broad portfolio of powerful products to extend, switch and distribute keyboard, video and mouse signals, G&D provide users from all applications with maximum customer benefits and real added value.

Picture source:
DFS Deutsche Flugsicherung
123rf

KVM solutions for:

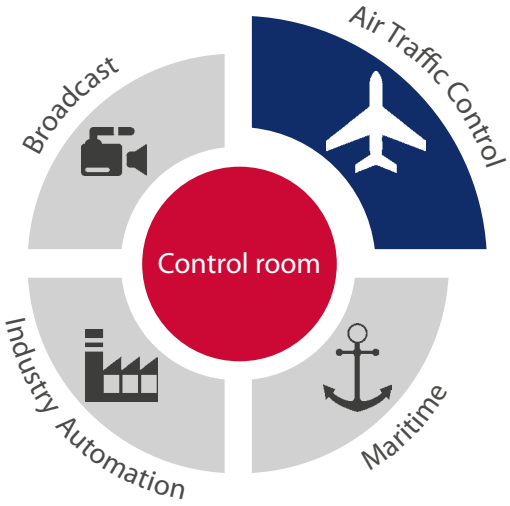
- Towers and remote towers
- Air traffic control
- Control centres at the airport
- Baggage handling

G&D offers the largest KVM product portfolio at the market. You can easily combine different G&D products with each other, thus offering you the greatest possible flexibility and an excellent basis for growing systems.

Our KVM solutions optimise the use of your IT equipment and increase productivity for humans and machines. If you need the best possible KVM equipment for your specific application, then ask for G&D – from professionals to professionals.

Your advantages:

- Improved working conditions, e.g. through noise and heat reduction
- Reliable 24/7 operation
- Preventive monitoring
- Proven redundancy concepts for even more security
- Increase of efficiency
- Personal advice and support for your customized solution



KVM extenders

Products for extending computer signals over distances up to 10,000 m

- DP1.2-VisionXG
- DP1.2-Vision-CAT/-Fiber
- DP-Vision-CAT/-Fiber
- DVI-Vision-CAT/-Fiber
- KVM-over-IP extender systems

KVM switches

Products for operating multiple computers via one workstation

- DP1.2-MUX
- DP1.2-MUX3-ATC
- DL-MUX
- TradeSwitch

KVM matrix systems

Products for simultaneously operating multiple computers via multiple workstations

- ControlCenter-Digital
- ControlCenter-Compact
- ControlCenter-IP

KVM features

Features for increasing productivity of various KVM applications

- Preventive monitoring
- SNMP trap & agent
- CrossDisplay-Switching
- Screen-Freeze function
- Push-Get function

KVM solutions for Air Traffic Control

KVM in control towers| Improve working conditions for air traffic controllers

The mission-critical applications of the control tower require air traffic controllers' absolute and constant concentration. That's why it is so important to provide the very best possible working conditions with no diversions or disturbances. In the limited space of the tower, the noise and heat generated by the powerful processors of the computer system creates an unwanted disturbance.

However, thanks to KVM equipment, you can store computers in an access-protected and air-conditioned technical room. This solution not only saves valuable space in the tower but reduces the noise and heat emissions at the workstation. With KVM extenders and KVM KVM matrix switches, controllers are still able to fully access their computers in real-time and with full performance.

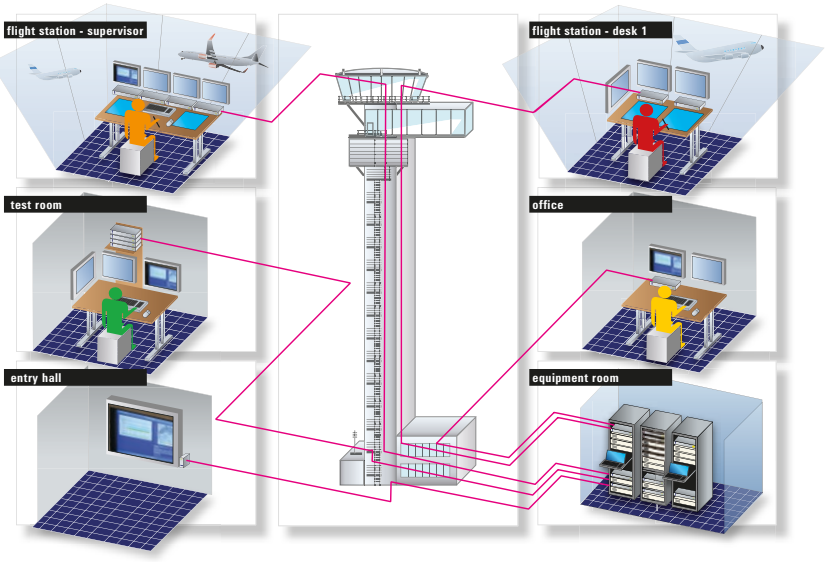
With G&D KVM extenders, you can access computers from a distance of up to 10,000 meters. Controllers can set about their tasks without even realizing they are operating their computers remotely. KVM systems relieve air traffic controllers of their work without being perceived by them.

If several controllers need to access the same computers, KVM matrix switches from G&D offer you the perfect solution.

How KVM works in the tower

KVM products are an essential part in towers. Once the computers had been removed to a central equipment room, they were connected to a KVM matrix switch, e.g. ControlCenter-Digital 288. The extender feature of said matrix switches established connections to offices, the test room and finally up to the flight station with all working positions. Thanks to the KVM equipment in use, all workstations have access to the remote computers – of course taking into account the assigned user rights.

In a separate testing room, employees inspect any IT equipment thoroughly. And even from here, technicians can access and maintain the computers.



KVM in Air Traffic Control Centres | Preventive monitoring, Redundancy and Fallback

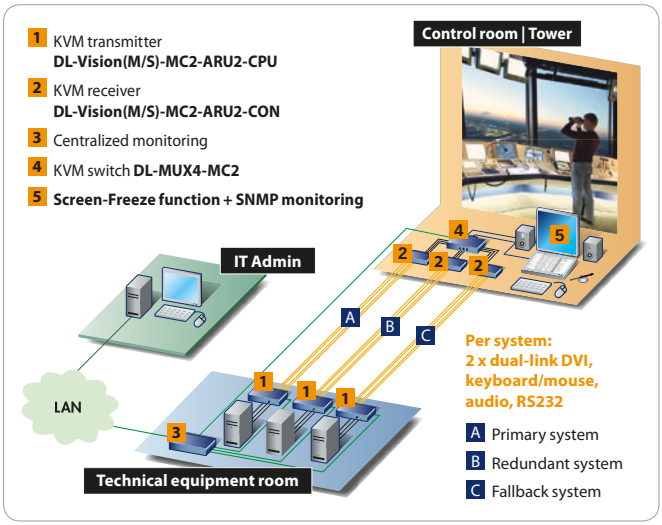
Mission-critical tasks such as coordinating departures and arrivals and monitoring of overflight traffic and satellite navigation requires the maximum reliability of all IT components.

The use of KVM extenders, such as DL-Vision, does not only improve the working conditions for people and computers, but also enables preventive monitoring and event reporting. At any time the administrator can get an overview of the device's status in the web interface. Depending on results or predefined thresholds, the systems trigger and send messages to the system administrator, allowing them to react before any failures occur.

Redundant and fallback systems are especially essential in mission-critical applications. G&D provides you with the option of designing all KVM components, systems, and premises redundantly. Even in the case of complex failure scenarios, controllers can continue their tasks non-stop.

Your benefits | Full safety thanks to redundancy and fallback

- Due to active monitoring & SNMP, the admin will be notified about critical system states, like excessive temperature and suchlike, even before it will be detected by the user. This enables the admin to be responsive to the situation right away
- Redundancy and Fallback concepts allow the controllers to continue his tasks non-stop, save, intuitive and in his usual working environment, even in the case of complex failure scenarios
- Unrestricted computer access with optimized and emission-free work conditions for the users
- Enhanced focus of users by preventing fan noise, heat loss and emission of the computers
- Reduced quantity of peripheral devices ensures tidy work areas
- Possibility of switching and accessing the respective computers remotely
- Centralized, unhindered computer maintenance



KVM solutions for Air Traffic Control

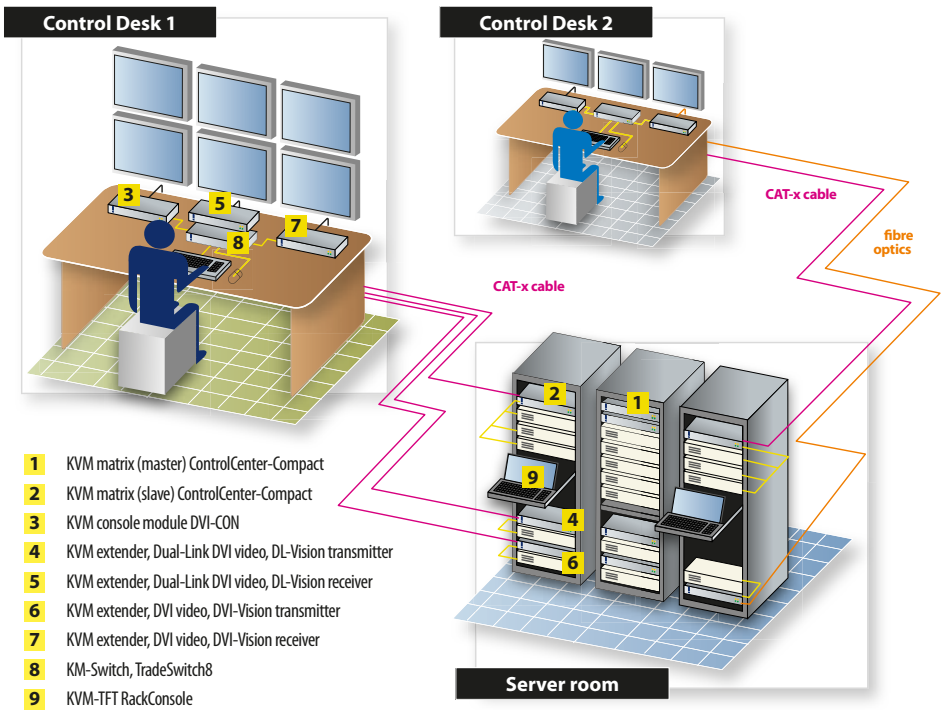
Baggage Handling | Increasing efficiency & remote access to all connected computers

Screening, unloading, sorting, storing, transporting, uploading – a baggage handling system runs in a continuous cycle. That's why efficiency and reliability are so crucial. The baggage handling control room continuously monitors and controls all the processes involved in the task cycle.

Inside this room, operators are working with multiple computers, 24 hours a day, 7 days a week. The use of a KVM matrix switch, e.g. a ControlCenter-Compact, allows several users to access different computers at the same time. Thanks to the KVM equipment in use, the computers are not needed at the workstations, but can be moved into a central server room.

At the workstations, keyboard, monitor and mouse are directly connected to the console modules (e.g. DVI-CON), which again are connected to the central module using CAT cables or fiber optics. Additional special computer modules enable the implementation of DisplayPort™, DVI and VGA signals into the matrix switch.

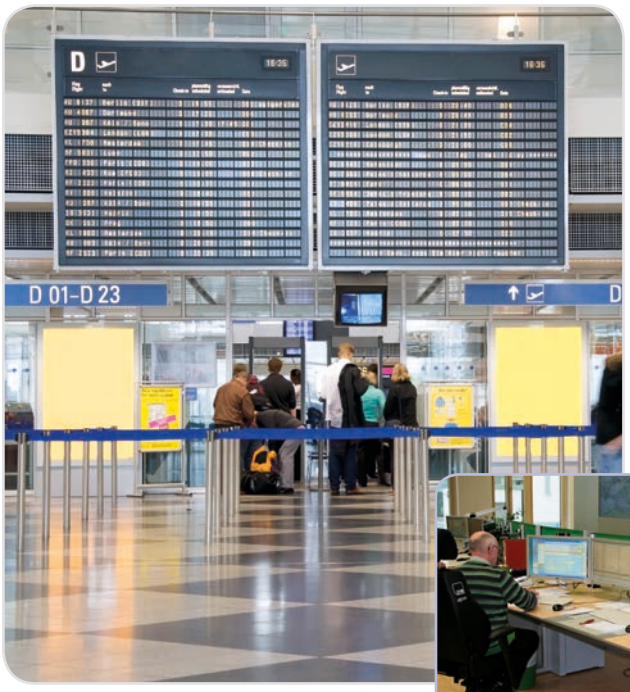
How KVM improves Baggage Handling

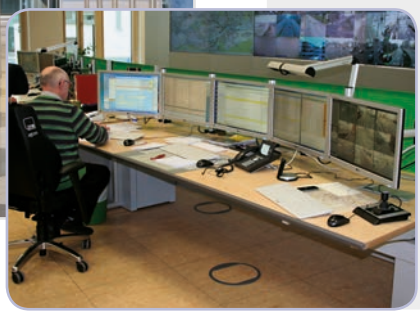


Application example: In the baggage handling section all computers were removed from the control centre and stored into a separate equipment room. Here, they were placed in clearly arranged server racks and connected to a KVM matrix switch. Now several users are able to access a large variety of computers remotely. Some computers, however, could not be connected to the matrix switch, because they were assigned to particular employees. In such cases, KVM extender systems extend computer signals directly to the corresponding desks.

Your additional benefits: By applying G&D's KVM products, computers can be maintained directly in the equipment room, thus helping employees remain focused on their work instead of being distracted by maintenance workers.

General Control Centres at Airports | Efficient multi-monitor workstations



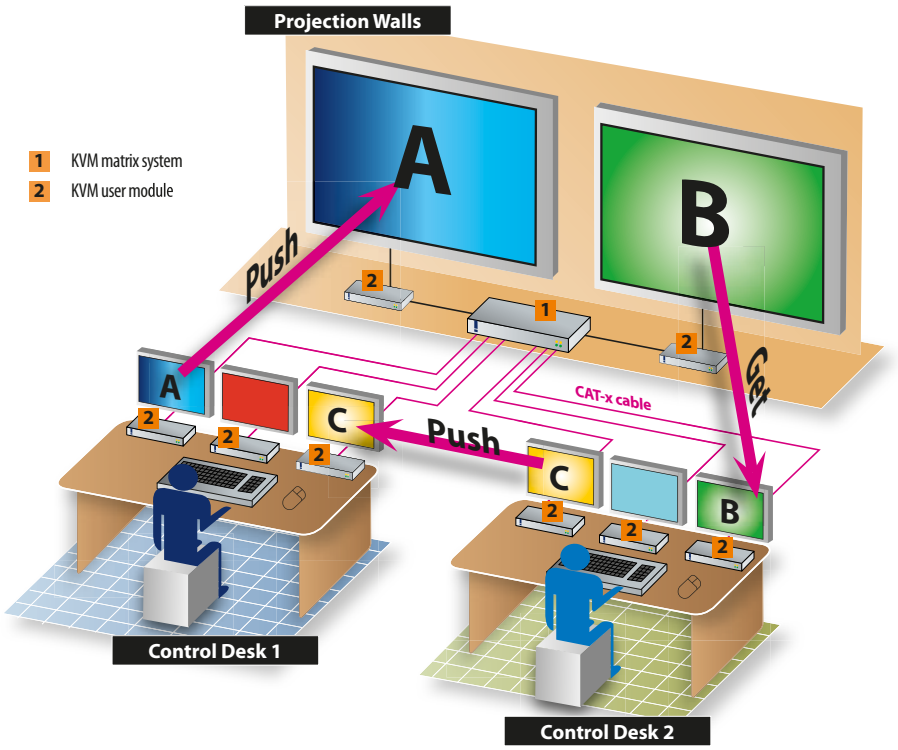


G&D offers numerous useful products and KVM features, such as the TradeSwitch and CrossDisplay-Switching, to improve the working conditions in control rooms.

Workplaces in air traffic control are often equipped with several keyboard and mouse devices to operate different computers. In this case, G&D's TradeSwitch is the ideal solution since it lets you operate up to eight computers with only one keyboard and one mouse.

Switching is simple and intuitive with CrossDisplay-Switching (available for all G&D matrix systems). The mouse can be moved seamlessly across all connected displays. When moving the cursor from the active to another display, the keyboard-mouse focus automatically switches to the connected computer. This provides you with an efficient multi-monitor workstation and pleasant and intuitive operation – without unnecessary peripheral devices.

Push-Get function | Optimized teamwork



G&D's KVM matrix systems support an optional push-get function. This function allows you to push the screen content of a target from one screen to another – or to get it from there. It also optimizes collaboration between team members, and control room staff can easily work together on tasks or problem solutions.

Depending on the application, this function can even reduce the number of computers required.

KVM extenders

Digital and analog extenders enable you to operate your computers over IP systems or dedicated distances up to 10,000 m whilst maintaining real-time performance. The systems consist of a transmitter and a receiver module. A local console at the transmitter module placed in the server room makes it easy for the IT staff to maintain the system.

KVM extenders transmit the following computer signals:

- DisplayPort™1.2a + 1.1a, HDMI, DVI (single link & dual link) and VGA
- Keyboard/mouse (PS/2 & USB)
- USB 2.0 transparent
- Audio & RS232
- Signal transmission over standard IP-based networks, CAT or up to 10,000 m via fiber optics
- Real time perfomance
- Remote power swichting sequences
- For up to four video channels
- Predictive maintanance via SMNP and Monitoring
- Redundant power supply
- Two network interfaces
- Screen-freeze function
- Transparent transmission of E-DDC information
- Ident LED for locating device in large installations

KVM switches

DP, DVI and VGA KVM switches are designed to operate two to eight computers via one console consisting of keyboard, monitor and mouse. By cascading several KVM switches, it is possible to switch and operate up to 64 computers from one workstation.

DVI switches also transmit VGA video signals and so enable users to work in mixed mode.

KVM devices switch the following computer signals:

- DisplayPort™1.2a + 1.1a, DVI (single link & dual link) and VGA
- Keyboard/mouse (PS/2 & USB)
- USB 2.0 transparent, USB 3.0 transparent
- Audio
- Mixed operation of DP, DVI and VGA on input and output side
- Available as variants transmitting one, two, three or four video channels
- Work in a user-friendly and ergonomic environment and have less peripherals at your desk

KVM matrix systems

With KVM matrix systems you can access multiple computers over multiple user consoles simultaneously. They consist of computer modules, central modules and console modules. G&D products allow a flexible operation of large, distributed IT installations even with multiple user consoles connected.

KVM matrix systems transmit the following signals:

- DisplayPort™1.2a + 1.1a, HDMI, DVI (single link & dual link), bidirectional signals and VGA
- Keyboard/mouse (PS/2 & USB)
- Audio
- RS232 and USB 2.0 transparent
- USB 3.0 transparent (CCD-160 + CCD-288)
- Signal transmission over standard IP-based networks, CAT or up to 10,000 m via fiber optics
- Available as variants transmitting multi-channel video
- Several thousand computers can be connected in cascading or with the KVM Matrix-Grid™
- Remote access (local and over IP)
- Push-Get function to show screen contents on other monitors or large screen projections
- Intuitive swichting via CrossDisplay-Swichting

KVM add-ons

Add-on products increase productivity and efficiency of computer application.

G&D provides the following add-on products:

- TFT-RackConsoles for DisplayPort™, single link DVI and VGA; 17" display requires only 1 HU
- Programmable input devices for optimised device control
- Solutions for space-saving rack fasteners
- Easy switching of KVM switches by pressing a button (Operator Panel)
- Centralized, proactive monitoring and configuration of network-capable G&D devices
- Integration of your individual applicated operating concepts (e.g. via touch panels)

Get the most reliable and approved KVM Extenders and make your working positions more efficient and flexible. G&D KVM Extender solutions enable you to access remote computers placed up to 10,000 meters away in real-time without any loss in quality and performance. A system always consists of a transmitter (computer side) and a receiver (user side).

Common features of G&D's digital extenders

- Transmission range up to 140 metres via CAT and up to 10,000 meters via fibre optics
- Support of keyboard and mouse (PS/2 & USB)
- Transmission of bidirectional audio and RS232 signals
- Embedded audio (for DP variants)
- USB 2.0 transparent (for ARU2 variants)
- Proactive monitoring & SNMP
- Single- and multi-channel variants
- E-DDC and DDC/CI support
- Ident LED to quickly find devices in complex installations
- Screen-freeze function
- "Config Panel 21" web interface (based on HTML5, Java-free) to configure systems and show monitoring values
- Redundant power supply (external or internal)
- Galvanic separation of transmitter and receiver (for Fiber variants)

Uncompressed video transmission: pixel-perfect, latency- and loss-free

The question of whether to use compressed or uncompressed video transmission often plays a decisive role when selecting KVM equipment for air traffic control rooms. G&D's non-compressing extender systems extend incoming video signals with absolutely no loss. For uncompressed transmission, the systems require a higher bandwidth, which in turn requires more powerful components.

- Uncompressed latency-free video transmission (zero delay), no frame drops, no tearing

DP1.2-VisionXG

Uncompressed extension of DisplayPort 1.2a video signals

The KVM extender DP1.2-VisionXG can be used to extend high-resolution 4K video signals, or even 8K video signals with MC4 versions, at full 60 Hz.

4K Ultra HD 8K Super Hi-Vision UNCOMP Uncompressed system

DP1.2-VisionXG-Fiber-MC4

More highlights:

- Innovative transmission pools
- Fallback compression for emergency operation
- DDC/CI support
- Ventilation concept for the use in cold/hot aisle installations

DL-Vision-DP and DL-Vision

Uncompressed extension of DisplayPort 1.1a and dual-link DVI video signals

The KVM extender DL-Vision-DP can be used to extend high-resolution 2K video signals, or 4K video signals with MC versions, at full 60 Hz. The KVM extender DL-Vision extends the dual link DVI video signal.

4K Ultra HD UNCOMP Uncompressed system

DL-Vision(MS)-MC2-ARU2

Get the most reliable and approved KVM Extenders and make your working positions more efficient and flexible. G&D KVM Extender solutions enable you to access remote computers placed up to 10,000 meters away in real-time without any loss in quality and performance. A system always consists of a transmitter (computer side) and a receiver (user side).

Compressed video transmission: lower bandwidth and compatible with matrix systems

G&D's compressing KVM extender systems also guarantee very high video quality and are therefore often used in air traffic control. Thanks to G&D's compression method High Dynamic Image Processing, level 3, video signals are reproduced pixel-perfect and visually loss- and latency-free – despite a lower bandwidth. One of the key advantages of compressed signals is that they can be processed, extended and switched via a KVM matrix system.

DP1.2-Vision and DP-Vision

Uncompressed extension of DisplayPort video signals

4K Ultra HD | Mix & Match Compatible with G&D matrix systems

DP1.2-Vision-CAT

- DP1.2-Vision: Support of DisplayPort 1.2a video; Max. resolution per video channel: 4096 × 2160 @ 60 Hz (4 K @ 60 Hz)
- DP-Vision: Support of DisplayPort 1.1a video; Max. resolution per channel: 2560 × 1600 @ 60 Hz

DL-DVI-Vision and DVI-Vision

Compressed extension of dual link and single link DVI video signals

4K Ultra HD | Mix & Match Compatible with G&D matrix systems

DL-Vision(M/S)-MC2-ARU2

- DL-DVI-Vision: Max. resolution: 2560 × 1600 @ 60Hz)
- DVI-Vision Max. resolution: 1920 × 1200 @ 60 Hz

KVM-over-IP extender systems: extend signals by using IP structures

Therefore, G&D now offers you KVM extenders that enable access via IP structures. KVM-over-IP extender systems use G&D's KVM-over-IP technology to transmit signals. Thus, operators can access the connected computers over IP structures. The transmission is based on IP networks over gigabit Ethernet networks (OSI model layer 3).

KVM over IP | Mix & Match Compatible with ControlCenter-IP matrix

DP1.2-Vision-IP

4K Ultra HD

DP-Vision-IP

4K Ultra HD

DL-DVI-Vision-IP

DVI-Vision-IP

KVM matrix systems let you operate multiple computers from multiple workstations.
The basic system consists of three components: the computer module, the central module and the user module.

ControlCenter-Digital and ControlCenter-Compact: powerful, reliable, secure

The ControlCenter-Digital and the ControlCenter-Compact enable the flexible use of KVM technology, provide stability during continuous operation and ensure r. eliable and accessible IT systems at all times.

Special security features of G&D's digital matrix systems

- Proactive monitoring & SNMP
- Processing and output of syslog messages
- Numerous switching and database concepts for even more security in failure scenarios
- Redundancy concepts (up to full application redundancy)
- Failover connections (if the central module fails, you can establish a direct connection between console module and computer module and still operate the system)
- Comprehensive user and rights administration
- Support of external authentication via LDAP, Active Directory, TACACS+, Radius
- Boot loader, operating system and firmware form a trusted computing platform to protect the system against third-party manipulations
- Modules that do not allow transparent USB transmission (e.g. no unauthorised use of USB sticks)
- Redundant power supply
- Shipped in an aluminium housing for best noise immunity

Further common features of ControlCenter-Digital and ControlCenter-Compact

Transmission

- Transmission range between two components up to 140 metres via CAT and up to 10,000 meters via fibre optics
- Support of the following video signals: DisplayPort 1.2a and 1.1a, HDMI, single link DVI and dual link DVI, VGA
- Resolution: up to 4096 × 2160 @ 60 Hz (depending on computers, computer module and console module)
- Support of keyboard and mouse (PS/2 and USB)
- Transmission of bidirectional audio and RS232 signals
- Transparent transmission and switching of USB 2.0 signals
- USB pinning possible

Integrated, RSA-encrypted trusted platform module (TPM) protects any access and configuration data against exposure

Device and features

- Automatic detection of connected console and computer modules
- More flexibility with DynamicPort technology: between 8 to 288 dynamic ports can be freely configured for either console or computer connection
- Cascadable to up to three levels, expansion through bidirectional cascading via KVM Matrix Grid™
- Expansion of switchable signals either through channel grouping
- Two network interfaces for web interface, updates, administration, configuration and monitoring
- Local console for administration and configuration
- Text-based media control via TCP/IP, e. g. AMX, Crestron, VSM and KSE Commander
- Multi-monitor workstations including CrossDisplay-Switching
- "Config Panel 21" web interface (based on HTML5, Java-free) and on-screen display to configure systems and show monitoring values
- Use of touchscreens possible

KVM matrix systems let you operate multiple computers from multiple workstations.
The basic system consists of three components: the computer module, the central module and the user module.

ControlCenter-Digital

Flexibility in new dimensions

ControlCenter-Digital 288

ControlCenter-Digital highlights:

- Available in three different expansion stages: with up to 80, 160 or 288 dynamic ports
- Modular design: replaceable controller card (with central processor unit to administrate, monitor and control the system), replaceable switch card (holds central logic of matrix), I/O CAT cards, I/O Fiber cards, I/O-Card-Multi, I/O-Card-Trunk and fan modules
- Hot-swappable components can be replaced during operation. Hence, the system can be expanded or adapted during live operation.
- Three redundant power supplies ready to be replaced during operation
- Configuration data is saved on two SSDs which are connected over a RAID1

ControlCenter-Compact

High performance in compact form

ControlCenter-Compact 48F-16C

ControlCenter-Compact highlights:

Available in numerous expansion levels:

- CAT variants with 8, 16, 32, 48, 64, 80, 128 or 176 dynamic ports
- Fiber variants with 16, 32 or 48 dynamic ports
- Mixed variants (CAT and Fiber): with 48F-16C, 32F-80C, 32F-48C, 32F-32C, 32F-16C or 16F-16C dynamic ports

(more variants coming soon)

Mix & Match:

CCD and CCC are compatible with each other and use the same computer and console modules, which are also compatible with each other, thus making it possible to integrate extender systems into a matrix. This offers full flexibility and helps with future-oriented planning for growing systems.

ControlCenter-IP

Versatile functionalities combined with the flexibility of KVM-over-IP™

G&D's KVM-over-IP technology can be used extremely flexible. Therefore, the KVM-over-IP extender systems can be operated in a matrix mode using an additional control unit, the ControlCenter-IP. This allows you to distribute and share signals within a LAN infrastructure. In addition, there are many helpful control room features such as monitoring, scenario switching, push-get for optimal collaboration and the integration of video walls, and CrossDisplay-Switching for absolutely intuitive operation of multi-monitor workstations.

KVM over IP™

4K@60Hz over IP

ControlCenter-IP

KVM switches let you operate multiple computers from one console consisting of keyboard, mouse and monitor.Switching is carried out via keyboard hotkeys. Computers with multi-monitor graphics cards can be connected to multi-channel switches.

Common features of DP1.2-MUX3-ATC and MUX-NT switches

- Proactive monitoring & SNMP
- Screen-freeze function
- Embedded audio (except for DL-DVI-MUX-NT) and analogue audio
- Support of keyboard and mouse (PS/2 and USB)
- USB 3.0 transparent
- E-DDC and DDC/CI support
- Two network interfaces for web interface, updates, administration, configuration and monitoring
- Redundant internal power supply
- Galvanic separation of transmitter and receiver (for Fiber variants)
- Update via Config Panel 21 (HTML, Java-free, optimised operation)

DP1.2-MUX3-ATC

Instant switching of DP1.2 signals

The KVM switch DP1.2-MUX3-ATC is designed specifically for the use in ATC applications. With this switch, ATCOs are able to operate up to three computers via one console (e.g. primary, redundant and fallback system). The instant-switching system supports 4K resolutions at 60 Hz and avoids the short image interruptions during switching that are otherwise caused by the display. In the event of a computer failure, users can switch to a redundant system at the touch of a button – within a fraction of a second.

4K Ultra HD | **Incl. Instant switching**

DP1.2-MUX3-ATC-MC2

More highlights:

- Support of DisplayPort 1.2a resolutions (downwards-compatible)
- Resolution up to 4096 × 2160 @ 60 Hz (4 K @ 60 Hz)
- Channel switching via hotkey, SNMP, button, OSD, web interface, IP-Control-API or external serial device (OperatorPanel)
- Instant switching of DP1.2 signals thanks to unique G&D technology
- Automatic switching of channels in case of signal loss
- Hot-pluggable
- Ventilation concept for the use in cold/hot aisle installations
- Extremely high reliability

DP1.2-MUX-NT and DL-DVI-MUX-NT

The KVM switches DP1.2-MUX-NT and DL-DVI-MUX-NT also provide many features for mission-critical applications. The KVM switch DP1.2-MUX-NT enables you to operate up to two computers via one console and supports 4K resolutions at 60 Hz via DisplayPort 1.2a (downward-compatible). The KVM switch DL-DVI-MUX-NT enables you to operate up to four computers via one console and supports 2K resolutions at 60 Hz (4K @ 30 Hz) via dual link DVI. The DVI-I interface supports digital and analogue video signals (VGA).

4K Ultra HD

DP1.2-MUX-NT

OperatorPanel

Facilitates the operation of KVM switches

With the OperatorPanel, you can switch your KVM switch comfortably from your desk by pressing a button (up to eight channels). An “Enable” key prevents accidental switching. The OperatorPanel is also available as a handy in-desk variant for table mounting.

OperatorPanel 4

Benefit from G&D's sophisticated KVM features and expand your KVM system – for additional security, better collaboration and easier operation.

Preventive monitoring, SNMP trap & agent

Operational safety and reliability are essential for G&D devices. Together with SNMP trap & agent, the monitoring function of many G&D devices offers the following options and functions:

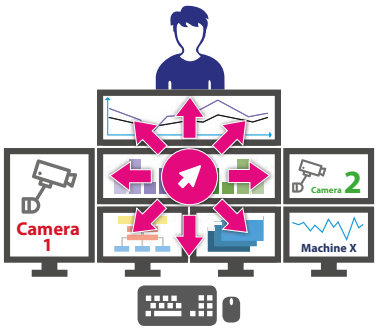
- Monitoring of system statuses
- Transmission of information via SNMP and as syslog message
- Defined conditions and exceeded thresholds are stored in the web interface and can be viewed anytime
- SNMP management software automatically receives any status event sent by G&D devices
- The SNMP-GET function enables you to query, for example, the device temperature and to provide statistics on top values as well as to recognise critical values in advance.
- SNMP-SET requests have an active impact on a G&D product (for example when changing channels at a KVM switch)

Redundancy, switching and database concepts for even more security in failure scenarios

CrossDisplay-Switching enables user-friendly switching via mouse cursor. The function is available for the ControlCenter-Compact, the Our KVM systems offer numerous options for creating redundancies for mission-critical applications. When used in air traffic control, all IP components must be available at all times. It is therefore particularly important that IT security concepts contain redundant systems in these fields of application. If a primary route, a computer or a workstation fails, you can simply switch to a redundant route, a back-up computer or a redundant workstation. This way you can finish your work safely and in a familiar environment. Numerous switching and database concepts provide additional security and facilitate the use of the installation.

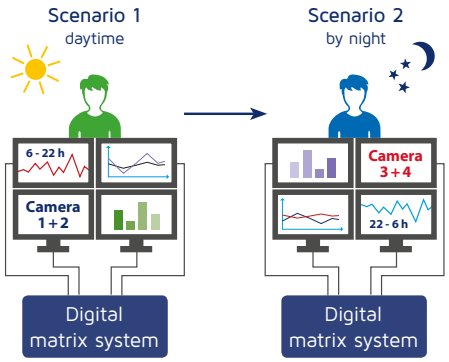
TradeSwitch function and CrossDisplay-Switching

CrossDisplay-Switching enables user-friendly switching via mouse cursor. The function is available for the ControlCenter-Compact, the ControlCenter-Digital and the ControlCenter-IP as well as for the TradeSwitch. More information on this topic is provided on page 7.



Scenario switching

Scenario switching lets you store the switching condition of one or multiple workplaces or even of the entire system. The selected switching states are saved in a script in the matrix system and can be accessed and executed via the OSD of workplaces assigned with the required rights. One single command allows a user to switch the computers of all consoles of a control room from day to night shift.



Push-Get function

With the Push-Get function, users can move the screen contents of a target to (push) - or get it from - the display of another console. This display can be a large screen projection, for example. All consoles can exchange computer and screen contents or work together on tasks. More information on this topic is provided on page 7.

DDC/CI support

For ANSPs, who value perfect workplace ergonomics, the DP1.2-VisionXG, DL-Vision and all KVM-over-IP extender systems offer the support of the DDC/CI protocol. Thus, screens in control rooms can be automatically configured and the brightness of the screens, for example, can simply be adjusted to external light conditions.

For more information, go to **https://www.gdsys.de/en/kvm-solutions/further-information/redundancy-concepts/ or contact us.** We will be glad to advise you.

G&D
IF IT'S KVM

From professionals for professionals

Trust in our professional KVM solutions - from planning to support

Headquarter

Guntermann & Drunck GmbH
Systementwicklung
Obere Leimbach 9
D-57074 Siegen

Phone +49 271 23872-0
Fax +49 271 23872-120

sales@gdsys.de
www.gdsys.de

US office

G&D North America Inc.
4001 W. Alameda Avenue
Suite 100, Burbank, CA 91505

Phone +1-818-748-3383

sales@gd-northamerica.com
www.gd-northamerica.com

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