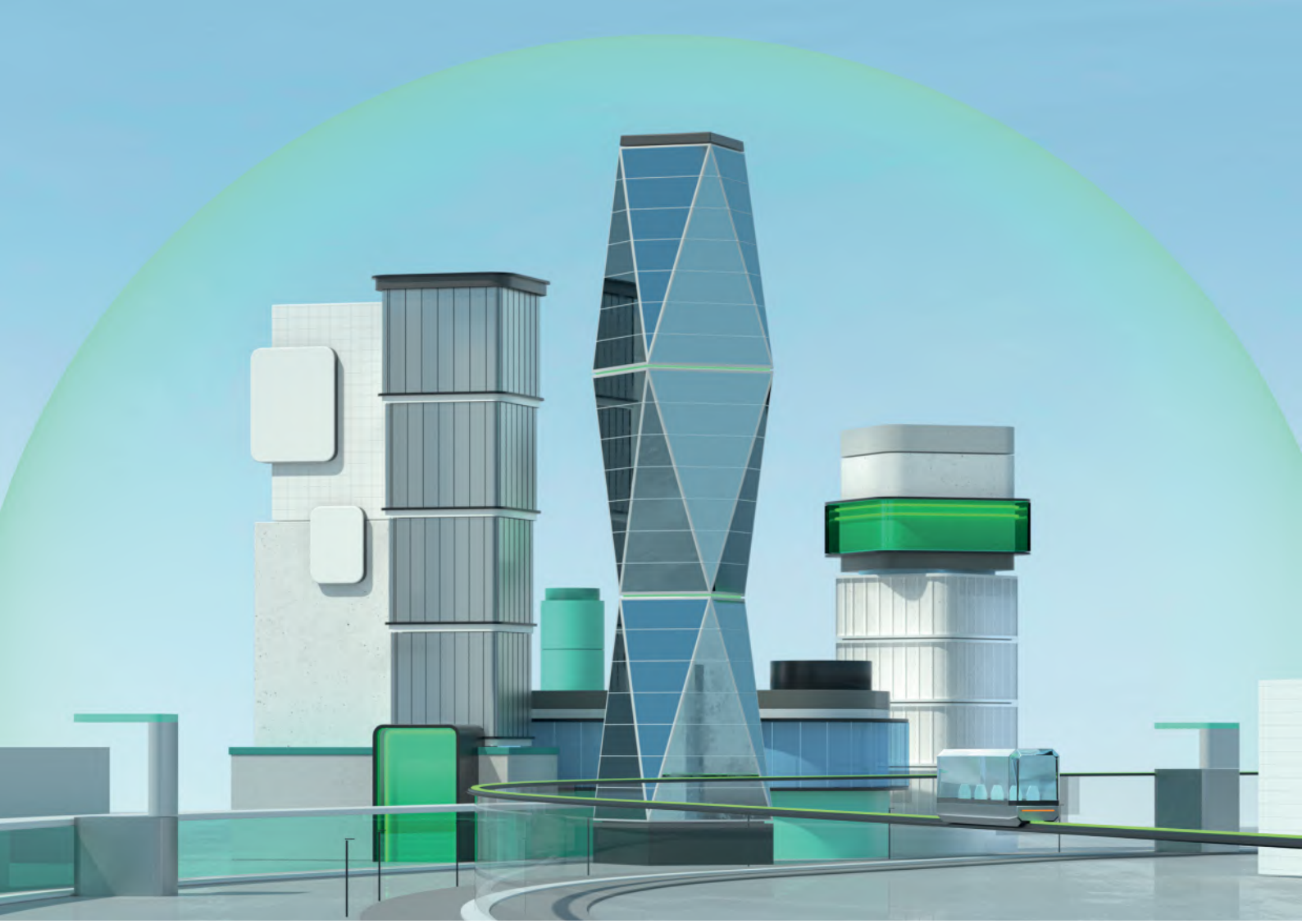


# Kaspersky IoT Infrastructure Security

KasperskyOS

Be Immune

Kaspersky
IoT Infrastructure
Security

# Protection of the internet of things on the gateway level

The internet of things (IoT) can make the world safer, more comfortable and productive. It can help conserve resources and efficiently manage digital infrastructures in different areas, from video surveillance to smart cities. It also enables the transformation of manufacturing into Industry 4.0.

The IoT concept encompasses an enormous amount of devices, technologies, software, and data transmission protocols. Such a diverse environment faces many risks at all levels.

It is possible to protect the internet of things **on the gateway level**. The device transfers all the data from equipment to cloud platforms. It means that security of the whole IoT networks depends on its security.

Kaspersky offers secure by design gateways based on KasperskyOS. These gateways are the key elements of the **Kaspersky IoT Infrastructure Security** solution and they help build reliable and functional systems for the internet of things.

The first Cyber Immune product to hit the market is **Kaspersky IoT Secure Gateway 100** based on the Siemens SIMATIC IOT2040 hardware. It securely transfers data from industrial equipment to cloud platforms using the OPC UA protocol. It has been created by Kaspersky and its subsidiary, Adaptive Production Technology (Aprotech), which helps industrial companies undergo digital transformation.

Another gateway is also a part of the solution. **Kaspersky IoT Secure Gateway 1000 β*** offers data protection and monitoring features. It is based on the Advantech UTX-3117 hardware, and uses the MQTT over TLS protocol to collect data and manage connected devices. Kaspersky Security Center enables centralized configuration and monitoring of all the events of KISG 1000. Together, the two products protect IoT infrastructures on the gateway level, making it possible to monitor them and manage events from a single console.

In future, the product line of **Kaspersky IoT Infrastructure Security** will continue to expand.

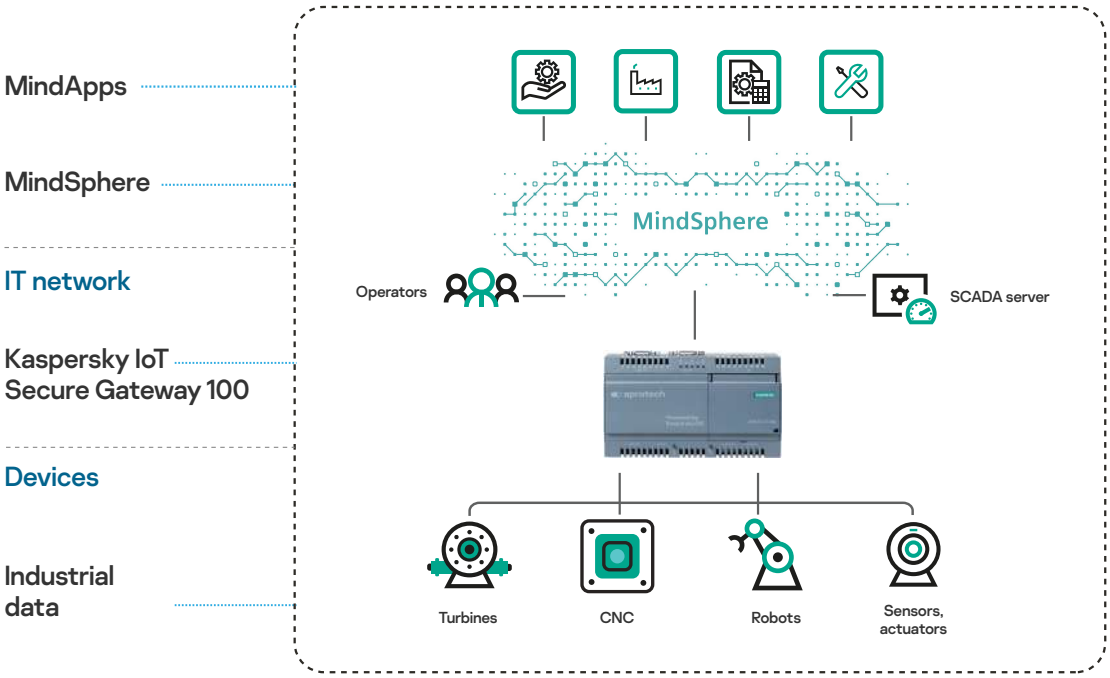
* The current version of the product is intended for non-commercial piloting

# Kaspersky IoT Secure Gateway 100

## Cyber Immune gateway for industrial internet of things

**Kaspersky IoT Secure Gateway 100** is the first Cyber Immune product based on KasperskyOS that is available on the market. The gateway helps industrial companies go through digital transformation: it is a universal bridge for fast and secure connection of OT with corporate IT.

Connecting industrial equipment to a cloud platform enables a detailed understanding of how it works; it allows for better control of production lines, optimizes manufacturing and minimizes downtime, increasing overall business efficiency. Kaspersky IoT Secure Gateway 100 is directly connected to various equipment to securely collect data, converting it to a convenient format and passing it to the Siemens MindSphere cloud platform for storing and processing.




**Kaspersky IoT Secure Gateway 100 in industrial IoT**

This IIoT gateway is capable of collecting large volumes of data generated by equipment. A typical SCADA system collects about 10-15% of data from the equipment. This is not sufficient for machine learning, predictive analysis and building math models.

Unidirectional transfer of data through Kaspersky IoT Secure Gateway 100 prevents external access to equipment from the outside. KasperskyOS technologies are the basis of the Cyber Immune gateway; they give it innate protection from cyberattacks. The microkernel of KasperskyOS paired with Kaspersky Security System block all unauthorized processes before execution.

This means that Kaspersky IoT Secure Gateway 100 secures the authenticity of the telemetry from equipment and permits the building of robust user applications on its basis for Siemens MindSphere, as well as working effectively with ERP and MES to control the production cycle.

## Features and benefits of KISG 100

| Connection | |
|---|---|
| **OPC UA (version 1.04)** | Collect and transfer data through proven protocol |
| **Siemens MindSphere** | Store and process data in dedicated IoT cloud |
| **Software** | |
| **OS** | KasperskyOS, SSL/TLS support |
| **Connectivity** | Mind Connect API 3.5<br>Siemens MindSphere |

## Supported hardware for KISG 100

| Siemens SIMATIC IOT2040 | |
|---|---|
| **Processor** | Intel Quark X1020 |
| **Size** | 53 (L) x 144 (W) x 90 мм (H) |
| **RAM** | 1 GB DDR3-SDRAM |
| **Ethernet** | Supports 100 Mbps LAN<br>2 x Ethernet (RJ45) |
| **I/O interfaces** | 1 x USB 2.0<br>1 x USB client<br>2 x COM ports (RS 232, RS 485) |
| **Data storage** | 1 x microSD |

## About Adaptive Production Technology services

Aprotech offers several services in partnership with Siemens to help industrial companies go through digital transformation:

- **BASE 4.0 consulting**
  It makes it possible to determine bottlenecks in the overall technological setup, or in a single technological process of an industrial company. A digital audit simplifies the transfer to new technologies needed for the gradual optimization of business processes. Based on the results of the audit, Aprotech can help implement technologies that can increase business efficiency (e.g. cloud connection).
- **Development of applications for cloud platform (Siemens MindSphere)**
  The IIoT platform has ready-made services for the basic monitoring of connected equipment as well as specialized applications for predictive analytics, big data analysis, as well as manufacturing efficiency analysis.
- **OEE service** (Overall Equipment Effectiveness)
  The service includes analysis of the general effectiveness of equipment as well as creation of tailored recommendations to improve OEE on the level of a single machine/production line. Three factors are assessed: availability of equipment, its productivity, production quality.

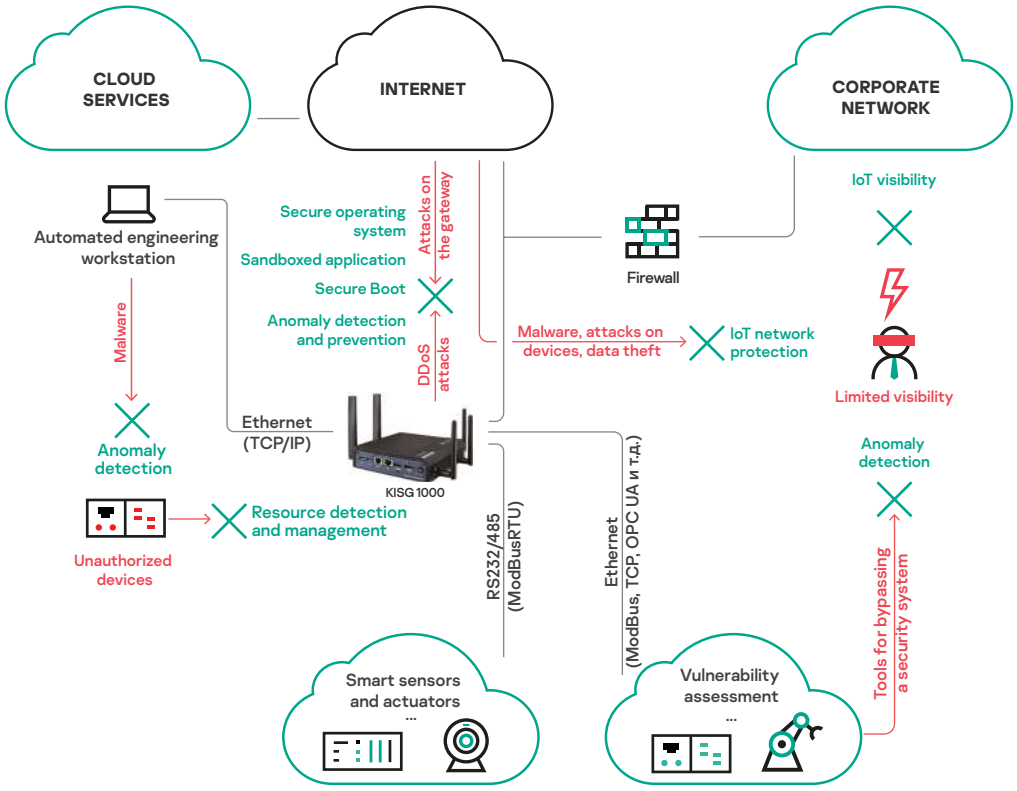
# Kaspersky IoT Secure Gateway 1000 β*

## Secure gateway for protected internet of things

**Kaspersky IoT Secure Gateway 1000 β** based on KasperskyOS is a product designed for building secure IoT systems. This secure-by-design device provides cybersecurity for the whole IoT infrastructure. The gateway has firewall functions, as well as the technologies of active protection, intrusion prevention and detection. KISG 1000 β also helps to securely connect IoT to public or private clouds. Centralized management and monitoring are carried out using the Kaspersky Security Center platform.

Here are the key features of Kaspersky IoT Secure Gateway 1000 β:

- Can work in other industries as well as manufacturing
- Aggregates data collected via different protocols (Zigbee, LoRa, Modbus, CanBus, PROFINET, OPC UA, etc.), and converts it for transmission over cellular networks and Ethernet (MQTT, CoAP, AMQP, XMPP)
- Not only collects, checks and distributes telemetry, but also transmits control commands received via MQTT to devices
- Performs security functions, such as device detection and classification, logging security events in IoT systems and protection from network attacks (IDS / IPS)




**IoT protection with Kaspersky IoT Secure Gateway 1000**

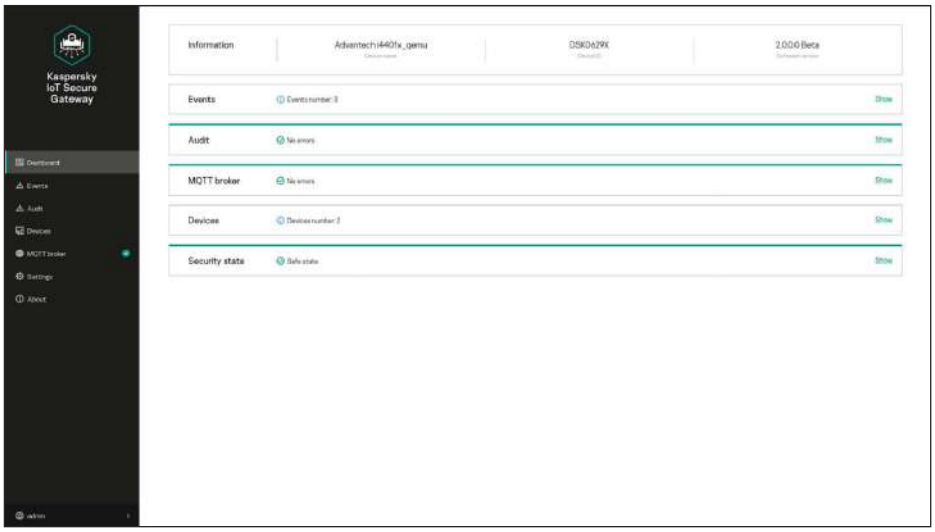
Kaspersky IoT Secure Gateway 1000 can be used as a security gateway — a specialized border network solution for protection of IoT and IIoT infrastructure from hacker attacks. It's possible to configure it for particular needs, as well as add new functions from partner products.

* The current version of the product is intended for non-commercial piloting

# Features and benefits of KISG 1000 β*

| | |
|---|---|
| **Подключение** | |
| **Ethernet** | Connection to data transmission networks over the Ethernet protocol |
| **Routing and NAT** | Communication between internal and external networks; use of NAT mechanisms |
| **DHCP server** | Building networks of endpoint devices featuring dynamic allocation of their IP addresses |
| **MQTT broker** | The Mosquitto-based MQTT broker enables data collection and management of connected IoT devices (sensors and actuators, smart relays, etc.) |
| **OpenSSL/TLS** | Support for commonly used encryption mechanisms to secure transmitted data |
| **MQTT over TLS** | Secure connection and protected transmission of data between the gateway and the cloud platform |
| **Integration with cloud services** | MS Azure, Amazon AWS, IBM Bluemix, and others.<br><br>Work with any cloud systems using the MQTT protocol; support of simultaneous operation with multiple cloud platforms |
| **Monitoring** | |
| **IoT Device Detection & Classification** | Detects and categorizes IoT devices based on their network activity.<br><br>The user interface lets you see all devices in the network, and new devices will be detected within 60 seconds after they are connected |
| **Reports and notifications (MQTT, SYSLOG, Push notifications)** | The administrator will be notified each time a new device is connected to the network |
| **Flexible security and gateway management** | |
| **Web interface** | User-friendly configuration and monitoring of the IoT network, visibility and transparency thanks to WebGUI. Informative dashboard lets you quickly get all the information you need |
| **IoT gateway protection against cyberattacks** | |
| **Core security** | Security at the level of the operating system kernel (KasperskyOS) |
| **Secure Boot** | Use of encryption methods on IoT devices to verify the integrity and authenticity of the firmware image before booting. Firmware that is corrupted or altered without authorization will not be loaded.<br><br>Secure Boot can be used together with hardware key storage |
| **Secure Update** | Working in conjunction with Secure Boot, this technology lets you upgrade firmware only with correctly signed and encrypted images from trusted sources |
| **IoT infrastructure protection** | |
| **IDS/IPS and Firewall** | Two mutually complementary mechanisms for protection against network attacks.<br><br>Firewall protects against unauthorized network access, and malicious activity detection (IDS/IPS) lets you quickly block an attack against nodes of the protected network |
| **Root of trust** | This approach is based on a chain of trust. The initial point of trust is chosen based on the specific requirements and can be set at the hardware level in complex cases |

* The current version of the product is intended for non-commercial piloting



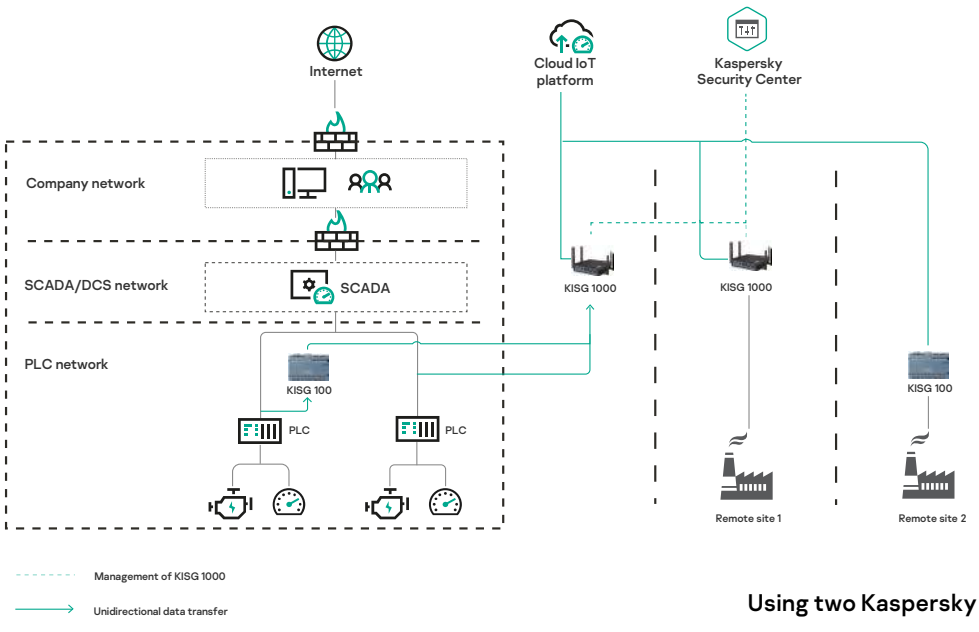

Kaspersky IoT Secure Gateway 1000 β* interface

## Supported hardware for KISG 1000 β

| Advantech UTX-3117 | |
|---|---|
| **Processor** | Intel Apollo Lake E3900 & N series processor, 2MB L2 Cache |
| **RAM** | Dual channel DDR3L 1867MHz, up to 8GB |
| **Ethernet** | Support of Dual 10/100/1000 Mbps LAN<br>LAN1: Intel I210AT<br>LAN2: Realtek RTL8111G |
| **I/O interface** | 1 x RS-232 with 5v/12v<br>1 x RS-422/485 full duplex with Phoenix connector<br>2 x USB3.0 port<br>1 x SATA interface, on-board support for SSD TPM Infineon chip SLB9665. Support for TPM2.0 |
| **Data storage** | 1 x SATA II SSD bay<br>mSATA 1, used concurrently with H/S MiniPCIE slot |
| **Expansion** | 1 x Sub1G or mSATA module supporting half-sized Mini PCIE<br>1 x full-sized Mini PCIE module with 3G/LTE support and SIM slot<br>1 x Wi-Fi M.2 module that supports electronic keys |

## Combining KISG 100 and KISG 1000

Kaspersky IoT Secure Gateway 1000 can be used together with Kaspersky IoT Secure Gateway 100 in IIoT by being installed higher — between the IoT and external data networks.



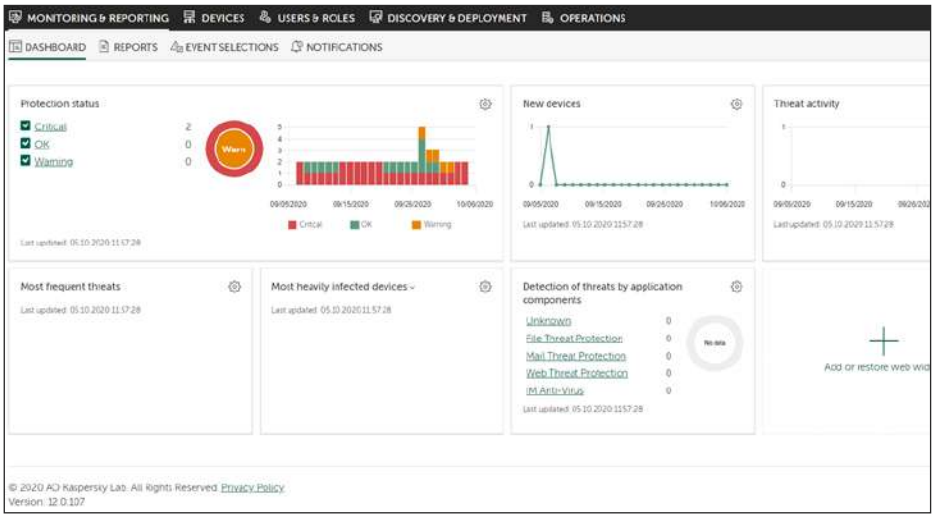

Using two Kaspersky IoT Secure Gateways in IIoT infrastructure

* The current version of the product is intended for non-commercial piloting

# Kaspersky Security Center

## Centralized management and monitoring of Kaspersky IoT Secure Gateway 1000 β*

**Kaspersky Security Center** helps you manage all events of Kaspersky IoT Secure Gateway 1000 β from a single center, track them and conveniently carry out their configuration. These two products form the comprehensive Kaspersky IoT Infrastructure Security solution for transparent, functional and secure internet of things.




Kaspersky Security Center interface

## Features and benefits

Kaspersky Security Center combines tools and technologies to form an advanced integrated platform for centralized administration, monitoring and security of IoT systems.

**Expedites routine tasks**

**Reduces vulnerability to attacks**

**Helps protect all your endpoints and servers**

**Simplifies administration**

**Ensures integrity of systems**

**Provides a complete picture of the IT environment**

| | |
|---|---|
| **Single management console** | Automation, transparency, reduced expenses, increased efficiency of administration, and correlation of events from various sources in IoT systems.<br><br>Restricted use of unsuitable or unsecure applications, devices and websites.<br><br>Quick and simple application of security policies on all endpoints |
| **Role-based access** | Each administrator can only access the tools and data relevant to their work responsibilities |
| **Easy scalability** | Scalability without changing the initial configuration: management of up to 100,000 physical, virtual and cloud-based endpoints using a single Kaspersky Security Center server.<br><br>Optimized backup capabilities |

* The current version of the product is intended for non-commercial piloting

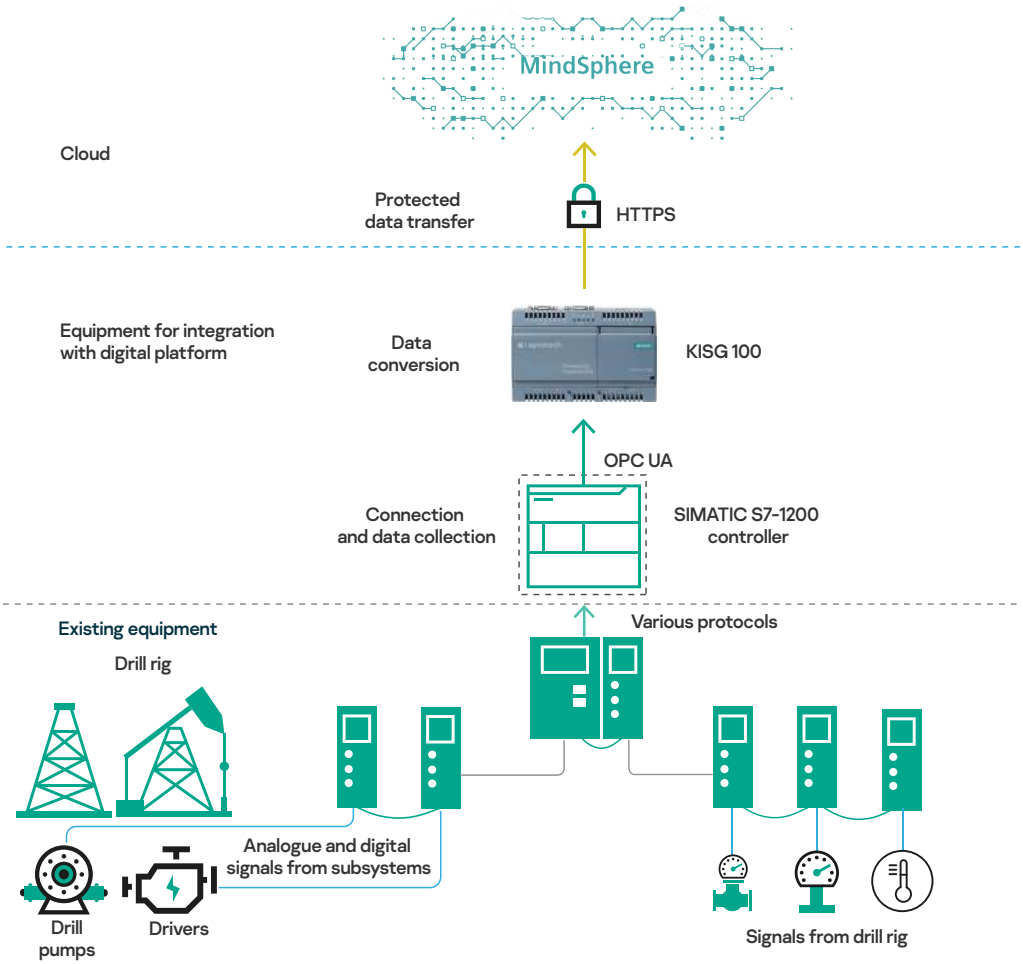
| | |
|---|---|
| **Expandable architecture** | If a new application is purchased or released, the corresponding extension can be installed without patching or re-installing the console |
| **Convenient alerts** | Notifications about incidents through various channels that are convenient for the administrator (text messages, emails, push notifications and others) |
| **Flexible reporting** | Customizable and ready-to-use reports with dynamic filtering and sorting by any data field |

# Use cases for Kaspersky IoT Secure Gateway

## Oil & gas industry

An oil producer wants to digitize their technology to implement machine learning and predictive analytics for their equipment. Cloud-based IIoT makes this possible. Equipment (drill rigs, pumps, drives, etc.) is equipped with sensors connected to the gateway which transfers data to a cloud or local storage and processing platform.

**Kaspersky IoT Secure Gateway 100** helps build functional IIoT infrastructure, securing trusted telemetry and preparing it for processing. The gateway collects data from all devices using specialized protocols and securely transfers it to the Siemens MindSphere cloud, preventing it from being compromised by external connections to the equipment.



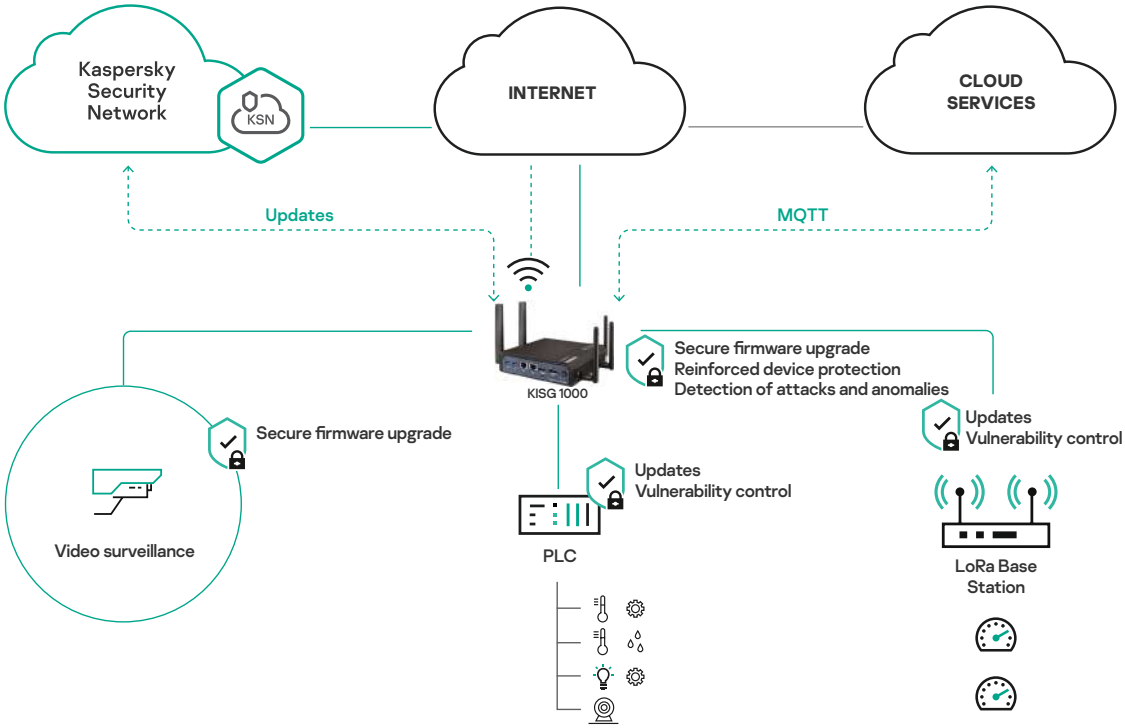

Even if there are vulnerabilities in connected IIoT devices, Cyber Immunity in Kaspersky IoT Secure Gateway 100 will prevent attackers from exploiting them and affecting the work of other equipment.

## Smart city

A residential building is equipped with systems that monitor the consumption of resources and manage electricity and water supply. The meters inside apartments are connected over the LoRaWAN wireless protocol.

Physical security of the systems is provided through remote-access video surveillance systems, motion detectors and door sensors. Information security is ensured by **Kaspersky IoT Secure Gateway 1000 β***, which blocks attacks launched against local devices and workstations, identifies unauthorized connections to the network, and protects the network perimeter and cloud communications.

**Kaspersky Security Center** provides convenient centralized management for the entire IoT infrastructure, helping monitor its security and promptly respond to incidents.



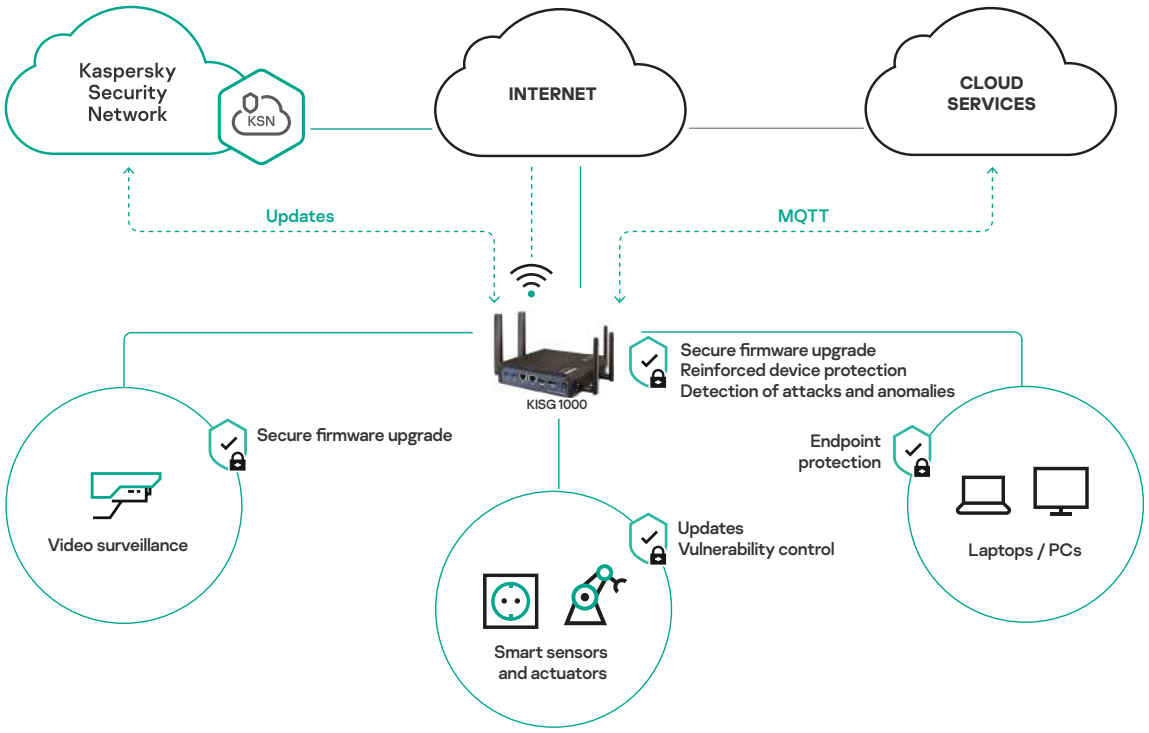

* The current version of the product is intended for non-commercial piloting

## Smart warehouse

A warehouse is equipped with climate control systems that can be managed through the cloud to continually maintain and control the climate in the warehouse from any location. Automated warehouse accounting is conducted via RFID sensors and tags and is managed locally (from user workstations on the network) and centrally.

Remote-access video surveillance systems, volume sensors and door sensors provide physical security for the warehouse. Information security is ensured by **Kaspersky IoT Secure Gateway 1000 β***, which blocks attacks launched against local workstations, identifies unauthorized connections to the network, and protects the network perimeter and cloud communications.

**Kaspersky Security Center** provides convenient centralized management for the entire IoT infrastructure, helping monitor its security and promptly respond to incidents.




* The current version of the product is intended for non-commercial piloting

**os.kaspersky.com**
**www.kaspersky.com**

**www.aprotech.ru**

KasperskyOS
Be Immune

aprotech **Powered by KasperskyOS**