PKI & Key Management

ECOS **TrustManagementAppliance®**

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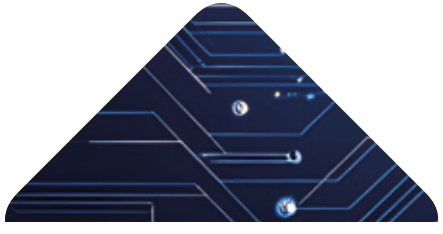
ecos

Secure Machine Identities for IoT and OT

Your foundation for a connected future



- **Certificate lifecycle management**
- **Unlimited scalability**
- **Security by design**

Cybersecurity
Made in Germany

Secure machine identities for IoT and OT

Your foundation for a connected future

While digital transformation is driving innovation in the industrial sector, it is also increasing complexity and cybersecurity requirements. Connected factories, IoT platforms and smart devices are both the fuel of modern industry and an attractive target for cyberattacks.

The ECOS TrustcAppliance® (TMA) provides digital identities, keys and certificates as the foundation for cybersecurity and future-proof digital infrastructures.

Rethinking security: Tackling the challenges of IoT and OT
IoT and OT environments play by different rules than traditional IT networks.

- **Scalability**: Millions of devices, sensors and actuators exchange data in real time. A unique and trusted identity is required for each of these devices.
- **Lifecycles**: IoT and OT devices are often in use for decades. It is imperative to have long-term security strategies that take into account future threats such as quantum computing.
- **Limited resources**: Many IoT devices only have limited computing power or storage capacity and require specially optimized security solutions.
- **Process integration**: Digital certificates and keys must be seamlessly integrable into production processes and already existing systems.

Advanced security measures are vital for the industry

Security by design is becoming an imperative with the increased level of regulations imposed by **NIS-2** and the **Cyber Resilience Act**.

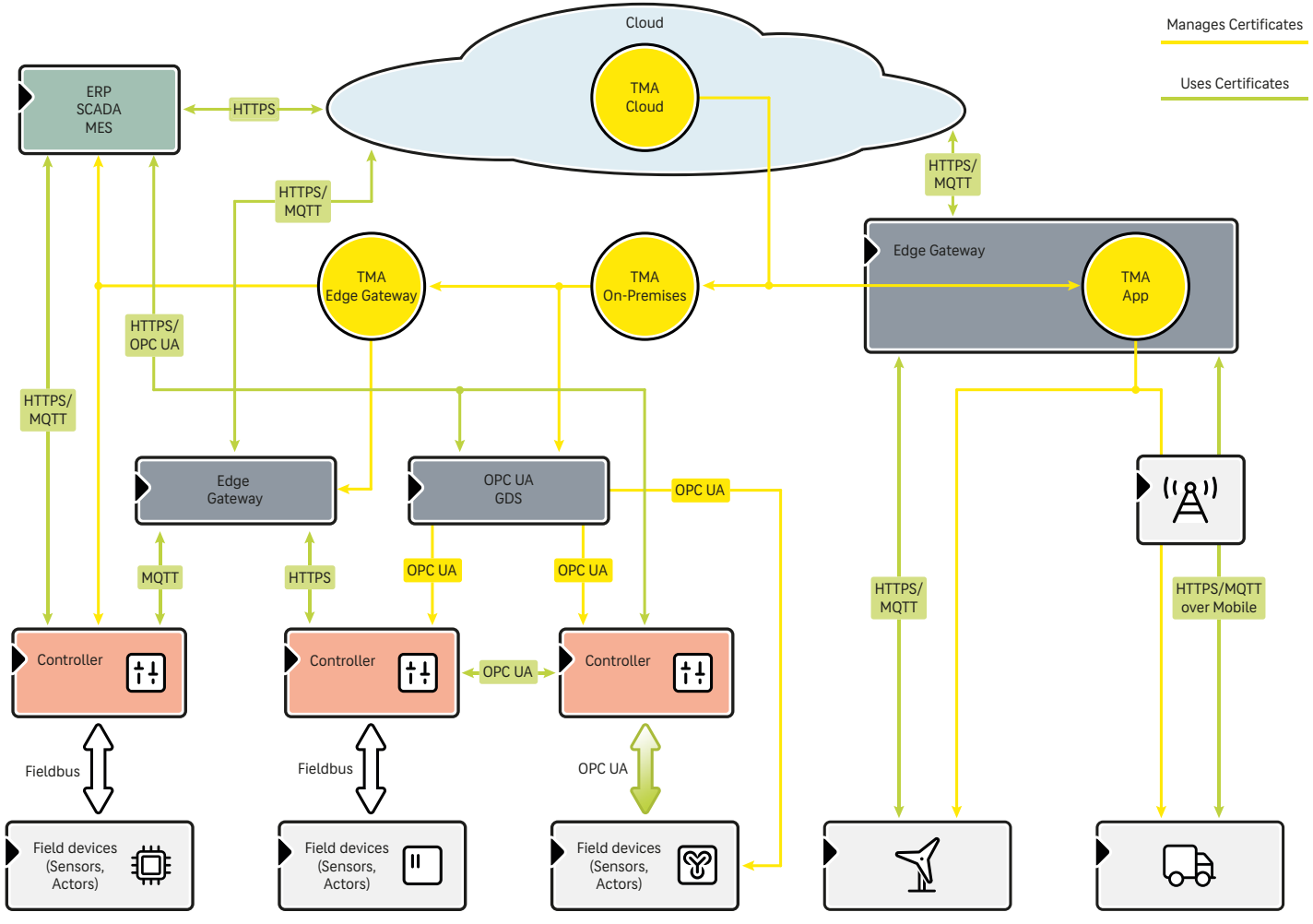
With the ECOS **TrustManagementAppliance®**, ECOS also provides organizations with comprehensive **advice** on **planning, implementing** and **use**, not only to achieve compliance, but also to improve your processes in the long term.

Cybersecurity made in Germany

With development, consulting and support all in Germany, we respond to our customers' needs individually and solution-oriented.

Secure communication in IoT and OT infrastructures
ECOS **TrustManagementAppliance®**

Sample application of the ECOS TMA in an OT environment



The figure illustrates a typical OT environment in which the components are communicating with each other.

While many fieldbuses provide only limited or no support at all for authentication and encryption, this is a standard feature of more recent protocols such as **OPC UA**. Further communication, for example via **MQTT** or **HTTPS**, can be secured by **TLS**. The different components require certificates. Certificates and digital keys may also be required for the devices being manufactured and must be securely installed during the production process.

The ECOS **TrustManagementAppliance** offers various options for organizing and automating certificate management and distribution. For example, it can provide certificates to an OPC UA Global Discovery Server, which distributes them throughout the OPC UA network. The TMA can also provide certificates for other systems through a variety of interfaces and flexible adaptability.

Depending on the requirements, the ECOS **TrustManagementAppliance** can be operated as a virtual machine on-premises, as an app on a multi-vendor edge gateway, or in the cloud. A new feature is the operation as ECOS **TMA Edge Gateway**, which is specially designed for manufacturing environments that require high availability and offline capability, but still need to be securely operated without special knowledge.

ECOS **TrustManagementAppliance®**
Cybersecurity made in Germany

The ECOS TMA is designed to meet the specific requirements of IoT and OT environments.

With the ECOS **TrustManagementAppliance®**, you are laying the basis for a long-term secure digital infrastructure. Our solution simplifies the creation, management and distribution of digital keys and X.509 certificates, which are essential for **confidentiality**, **integrity** and **authenticity** in IoT and OT infrastructures.

Our certificates are a prerequisite for the protection provided by:

- **Encryption**: To protect sensitive data and communication from unauthorized access, no matter whether between devices, systems or locations.
- **Signatures**: To ensure that data and software have not been altered and to guarantee the integrity of programs and machine controls.
- **Authentication**: To provide trusted machine identities, which is essential for zero trust concepts and secure networks.

Whether control units, SCADA, PLCs, IoT platforms or ERP systems: Our solutions provide the key to secure communication, regardless of protocols such as **MQTT, OPC UA** or **HTTPS**.

Encrypting, signing, authenticating

The ECOS TMA allows you to easily manage digital keys and certificates—for encrypted, signed and authenticated communication in IoT and OT systems.

Your benefits at a glance
Certificates and keys made easy
◆ Automated **creation, management** and **distribution** of certificates and keys.
◆ **Certificate lifecycle management**: Keep track of lifecycles, automatically renew certificates and reliably revoke compromised keys.
◆ Support of all relevant standards: **X.509 certificates, symmetric and asymmetric keys, protocols such as SCEP, ACME, EST, CMP** and much more.
Seamless integration into your environment
◆ **Flexible use**: Integration into existing PKIs, operation as root or sub-CA and connection to public CAs.
◆ **Open interfaces**: REST API, AD synchronization, SCIM, RADIUS, SNMP and log aggregation
◆ **Suitable for manufacturing**: Certificate application during manufacturing process through customized adaptations.
◆ **Available everywhere**: Whether on-premises, in the cloud, as an edge gateway in external systems or with service providers, online or offline.
Future-proof solutions
◆ **Post-quantum resilience**: Prepare for the era of quantum computing with cryptoagility and hybrid certificates.
◆ **Scalability**: Whether 100 or 100 million certificates, the ECOS TMA grows with your needs.
◆ **Investment security**: Designed to meet the security needs of the future.
Long-term partnership
◆ **Focus**: Specialized know-how for OT and IoT solutions.
◆ **Efficiency**: Quick to implement into your infrastructure.
◆ **Consulting and support**: Guidance from the design phase through the planning, implementation, and use of secure machine identities.

PKI and lifecycle management of certificates and keys for IoT/OT

Security begins with trusted identities

TMA Universe

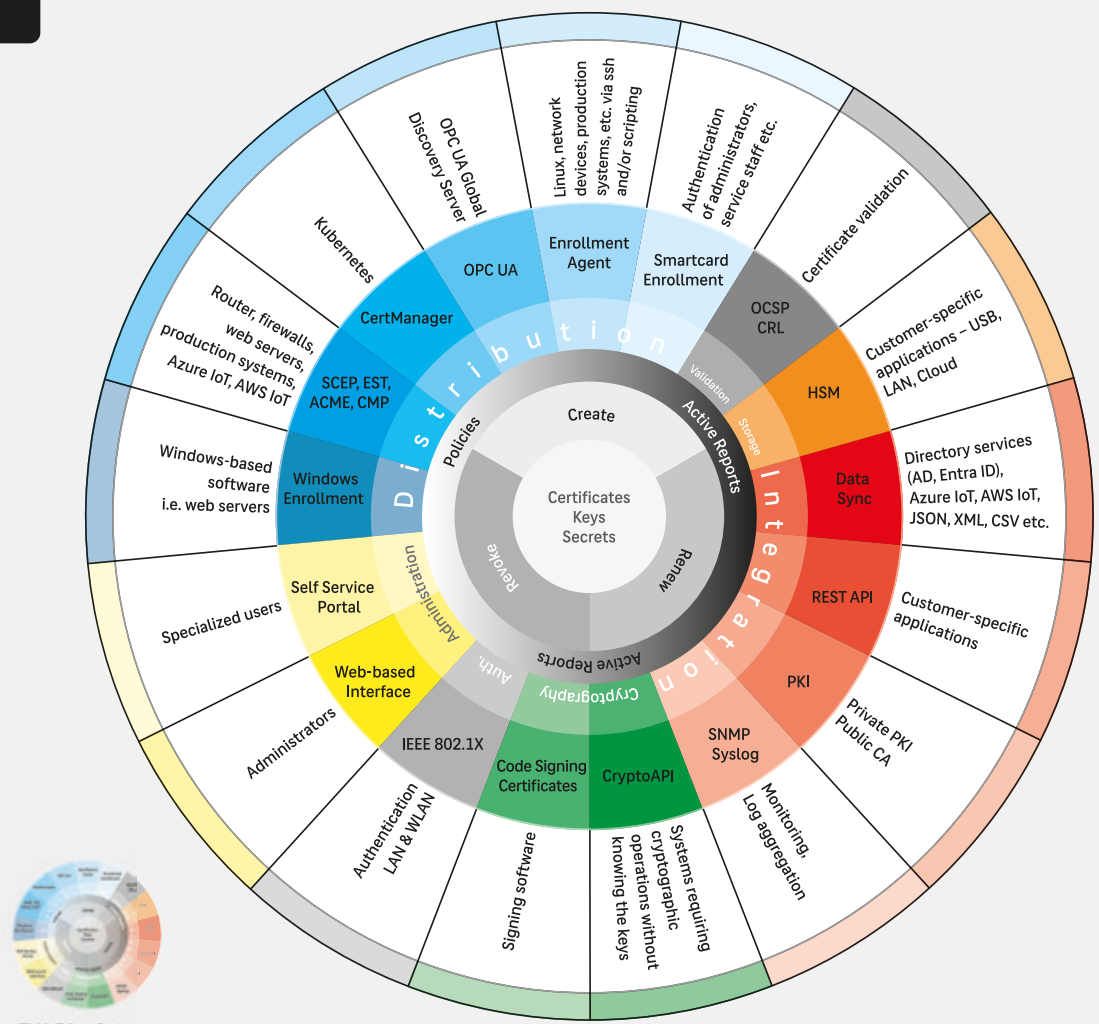
The ECOS **TrustManagementAppliance**® offers a comprehensive platform to securely manage cryptographic identities and keys in IoT and OT environments. Its architecture includes centralized functions for **creation**, **storage**, **distribution**, **validation** and **management** to ensure secure, scalable and automated management of digital identities across networked infrastructures.

Main features:

- **Automatic distribution**: Supports all major standard protocols, OPC UA, Kubernetes and more.
- **Certificate**: Automates issuing, renewal and revocation processes as well as OCSP and CRL.
- **Key storage**: Secure storage on HSMs, USB, LAN or cloud.
- **Logging & monitoring**: Integration in log aggregation systems and SNMP for event monitoring

Interfaces & integration:

- **IoT & OT compatibility**: Supports cloud IoT and industrial production systems.
- **Protocols & APIs**: REST API, SCEP, EST, ACME and CMP for a seamless integration.
- **Directory services**: Integration with Active Directory (AD), Entra ID and other LDAP-based systems.
- **Self-service & Administration**: Web-based interface and self-service portal for easy administration.



Automated certificate management
With the ECOS **TrustManagementAppliance®**

Why machine identities are indispensable

From sensors and actuators to complex production machines: The identity of every device must be verifiable beyond doubt in order to lay the foundations for industrial cybersecurity.

Preventing industrial espionage and information gathering for potential cyberattacks by encrypting all data streams.

Ensuring authenticity and trustworthiness in machine communication.

Securing industrial infrastructures against manipulation or attacks that may jeopardize entire production chains.

Fast. Secure. Automated.

Automated certificate management:
Secure and efficient with the ECOS TMA
Support for common standards:
For a seamless integration

Compliant certificate process:
Verification against predefined policies
Secure certificate provisioning:
Only approved requests are forwarded
Fully automated process

INDUSTRIAL CYBERSECURITY
Protecting What Powers Tomorrow

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ECOS **TrustManagementAppliance®**
Security begins with trusted identities

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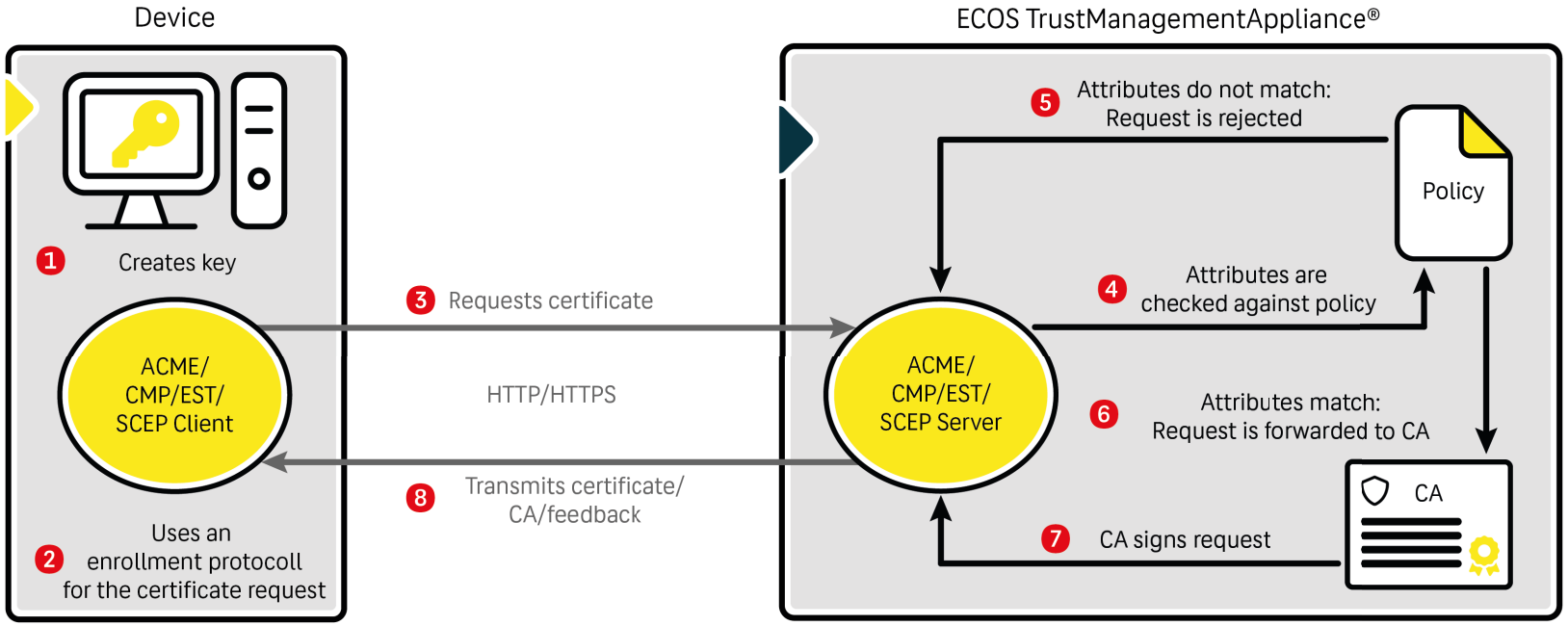
Issuing and renewing certificates with standard enrollment protocols



Automated certificate enrollment process

A key is generated on the device. It then sends its certificate request to the ECOS TrustManagementAppliance® server (❶, ❷ and ❸).

The certificate request's attributes are checked against the pre-defined policies (❹). If the attributes match, the certificate request is forwarded to the Certification Authority (CA) and, once successfully signed, sent back to the device (❻, ❼ and ❽).
If the attributes do not match, the request is rejected (❺).

The ECOS TrustManagementAppliance® ensures secure and compliant certificate provisioning in IoT and OT infrastructures through this structured process.

ECOS **TrustManagementAppliance®**

Your partner for industrial cybersecurity Made in Germany

Take advantage of a solution that is specifically designed to meet the needs of IoT and OT environments. **Efficient, scalable and a safe investment**, our experience and expertise provide you with the solid foundation for a connected future.

We deliver the highest security standards to meet the needs of your unique environment.

Choose the ECOS TrustManagementAppliance®: Shaping your secure digital future together.

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Make an appointment for a consultation!

For more detailed information on the ECOS TrustManagementAppliance®, please download the technical white-paper here.

ECOS 124.PB.TMA.2025/02.EN.04