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SMART DATA COMMUNICATION



IOT EDGE GATEWAY **DATAEAGLE 7050**

Speaks the language of all machines



IOT SOLUTIONS THAT WORK

Global and lifelong connectivity with the new IoT Edge Gateway DATAEAGLE 7050

Discussions and predictions regarding the Internet of Things (IoT) almost always end up in realizing that **successful solutions and business models are only possible using a globally functional, high-security and at the same time cost-effective connectivity between “things” involved.** The new IoT Edge Gateway DATAEAGLE 7050 exactly makes this realization reality. It provides best possible global connectivity at low costs and at the same time high flexibility for collecting and pre-processing data to be transmitted.

In systems of process technology or water and energy management cost-intensive pumps, compressors or generators provide valuable assets whose permanent operational availability – even at very remote locations – is of highest importance and therefore requires protection by diagnosis and maintenance measures. For this purpose, these machines are increasingly fitted with sensor systems capable of registering both normal degree of wear and irregular operating behavior or inadmissible operating conditions. This data is available immediately on the spot but at the same time should be accessible also to the head office of the operating company and/or the manufacturer and his maintenance staff. **Such a typical IoT solution enables short-term and cost-effective maintenance measures, thereby increases machine availability and at the same time avoids cost-intensive travel operations of maintenance staff. This may involve completely new business models for machine manufacturers if for instance a compressor manufacturer is keeping the compressor on the spot as his own property and is just selling the quantity of compressed air.**



PRODUCT VIDEO

[IoT Edge Gateway DATAEAGLE 7050 - Speaks the language of all machines](#)



GLOBAL NETWORK VIA MOBILE RADIO

Available data transport routes

Mediating global connections, in the dim and distant past of communication technology this was the job of the human switchboard operator (German "Fräulein vom Amt"), up into the 80ies still having assisted in switching international phone connections. From the technological point of view, those times are over, but demand for global connectivity has remained and due to the Internet of Things – IoT is featuring rapid growth. High data quantities require transmission from globally distributed transmitting stations (devices, machinery or systems with its sensory technology) to locally installed gateways, where they are evaluated and processed and finally sent to cloud portals for utilization and/or being forwarded. From the technical point of view, the "road network", globally available for those data transports is manifold:

There are far-reaching [site-to-site connections \(VPN\)](#), with tunneled Ethernet connections well suitable for single events – such as time-limited remote maintenance; however, for long-term monitoring they are quite inappropriate, since a VPN tunnel always requires being reestablished; moreover, missing data pre-processing involves comparably high transport costs.

Of course, [the internet](#) is attractive, which however up to now in many countries is still representing only a restricted regional coverage and whose utilization for safety reasons is additionally prohibited by many IT departments.

Finally, there is the globally very densely built [mobile radio network](#) with its many hundreds of providers which also reaches distant places and with several billions of participants is the globally most often used communication technology at all. Exactly this connectivity potential is applied by the [IoT Edge Gateway DATAEAGLE 7050](#) of [Schildknecht AG](#) by means of its universal eSIM card with a validity at 400 network operators in all over the world.



1920



2017



DATA COMMUNICATION

From the machine into the cloud and back, at flat tariff

As the name suggests, the [IoT Edge Gateway DATAEAGLE 7050](#) has been designed for being installed at the edge of a network, concretely at or in close proximity to the data-supplying machine and at the same time at the edge of the network leading from the machine to the cloud. The task of the gateway is collecting data already here (at the edge), processing and reducing it and thereby optimizing further transport across the network with regard to speed and costs. At the same time, this relieves mobile radio networks and the cloud, which in view of predicted rapid growth of intelligent devices and real-time expectations of users is indispensable, by implication making the IoT Edge Gateway really future-proof.

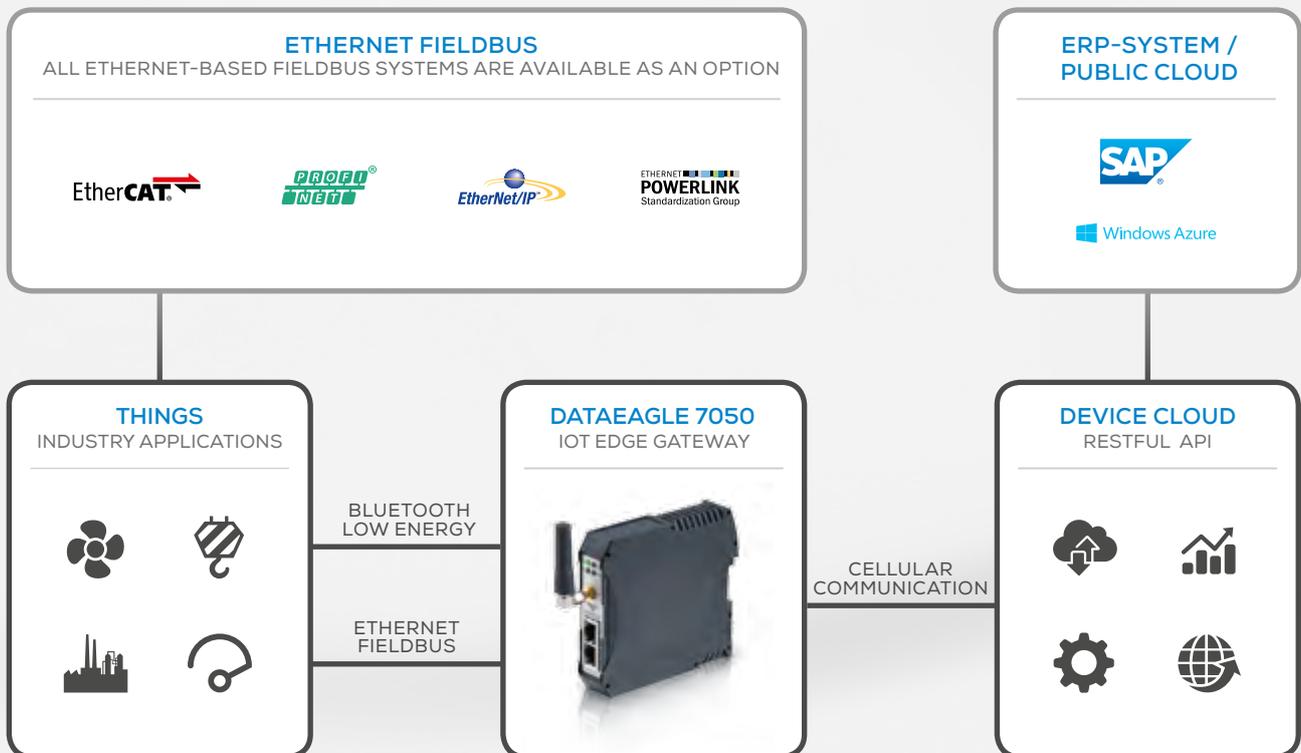


FEATURES AND FUNCTIONS

IoT Edge Gateway DATAEAGLE 7050

- **Collection of operating and diagnosis data** of the machine and its sensory system. There are numerous inputs available for this: Selection ranges from classic 4-20mA/0-10V-connection technology via Bluetooth Low Energy, Ethernet-based field-buses (PROFINET, CAN, Modbus, etc.) and in future also IO-Link up to inputs for Ethernet. All inputs have a modular design, enabling high flexibility both in case of basic equipment and also later extensions of the gateway.
- **Analysis and pre-processing** of collected data on the spot: This is provided by a program running in the gateway while evaluating data in an "intelligent" and configurable matter and e.g. only arranges for forwarding if data is changed or indicates an alert. In addition, data is compressed and after that sent to the device cloud in very small – also configurable – data packages at lower costs. This is considerably more cost-effective than for instance the operating concept of a mobile phone which sends packages of fixed size even if its content is only very small.
- **Anonymization of data:** Data is only provided with a time stamp and sent as pure values without any further information. Only a secured allocation at the customer or in the [DATAEAGLE Portal](#) makes this data becoming information again.
- **Update possibilities** using OTA (Over The Air) via the [DATAEAGLE Portal](#).

- o **Very low transport costs.** Monthly costs for a measuring point are in the range from **0,00€ to approx. 20,00 €** depending on the current operating mode: it optionally ranges from online mode (permanent connection) via interval mode (transmission only at certain values or at certain time intervals) up to free "sleep mode", during which the device is only "awakened" in case of need. This flexibility is enabled by the eSIM card included in the device, which thanks to its validity at approx. 400 network operators provides global and also lifelong connectivity since it is not – like conventional cards – switched off in some countries after not having been used for a certain period of time.
- o **Shipping processed data** via the locally strongest mobile radio provider from which data is directed to the specified cloud portal – where appropriate via further networks – and finally by internet back-bone (refer to picture ..). For this transport "across networks" the gateway is fitted with a universal, globally valid eSIM card which automatically induces utilization of the respectively strongest radio network (unsteered roaming). The number of networks potentially involved in the path from the gateway to the device cloud does not mean any impairment since user costs are calculated centrally in the portal (Device Cloud) in a role-based manner according to a flat tariff.





ENCRYPTION TECHNIQUES

End-to End data security is ensured

IoT solutions only have the chance of being fully accepted and utilized if during global transmission data is protected against failure and/or unauthorized third-party access. Taking a modern, highly reliable computer center for the portal for granted, both unambiguous identification of participants and high availability of communication connection remain challenges to be resolved. [The TÜV-certified IoT Edge Gateway DATAEAGLE 7050](#) solves this task by combination of encryption levels for both transport and backend-frontend application.

- o **Transport encryption** by server authentication (AES with ECDH), device authentication (DAS with ECDH) and hardware authentication (Kryptochip)
- o **Backend encryption** (on the server) by strict insulation of user databases, access control using RBAC and database encryption using AES
- o **Frontend encryption** (on the client) by access control using RBAC and TLS encryption (https)

AES: Advanced Encryption Standard
ECDH: Elliptic Curve Diffie-Hellman
DSA: Digital Signature Algorithm
RBAC: Role-based Access Control
TLS: Transport Layer Security
API: Windows Standard Interface for encryption

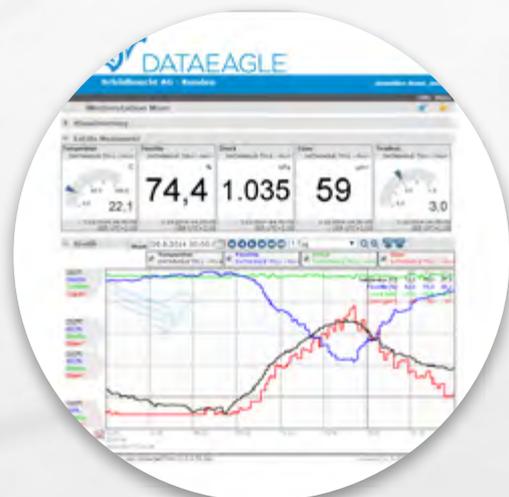


THE PORTAL AS A CENTRAL HUB

Device Cloud - www.portal.dataeagle.de

Wherever machinery equipped with IoT Edge Gateway is installed, it can feed its data into the network of the locally strongest mobile radio provider and send to the central switching center via this and further networks in the form of a Device Cloud under Portal.Dataeagle.de.

This portal with its dashboard and graphical interface assumes tasks such as administrating users, devices and access rights, sends new settings to the device or provides users the possibility to accept data by standardized RESTful API and integrate them in their own programs such as for instance ERP systems or cloud services; further functions comprise alerting, transmission and receipt confirmation for SMS, field intensity indicator of current data connection or creation of pdf documents and their delivery to authorized recipients.





20 YEARS OF DEVELOPMENT

Experience generates added value for the user

A particular strength of the [IoT Edge Gateway DATAEAGLE 7050](#) represents its "genetical" past: As the youngest member of the series of the [DATAEAGLE radio modules](#) proven on the market for more than 20 years and having been under continuous revolution, it applies comprehensive experience in using radio technology in the automation industry. Numerous technology generations and hundreds of user cases are thereby "patron" of the [IoT Edge Gateway DATAEAGLE 7050](#); so the first mobile radio applications have already been implemented more than ten years ago, amongst others in networking the first SMART FACTORY in Kaiserslautern. This makes a difference to market participants entering this market segment only now and generates an added value for users which in view of the requirements of Industrie 4.0 (a government initiative to promote the computerization of manufacturing) is paying well quickly.





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