SCHILDKNECHT
SMART DATA COMMUNICATION

DATAEAGLE®2000
SENSOR AND MEASUREMENT TECHNOLOGY

FOR SENSOR MANUFACTURERS
The perfect wireless system

Using the Wireless Sensor Gateway DATAEAGLE compact 2730, sensor manufacturers obtain the option to very easily integrate their wireless Bluetooth sensors into user control units. For this purpose, manufacturers can deliver their sensors together with a DATAEAGLE compact 2730 gateway as a package to machine or plant manufacturers, putting them in the position to offer their customers an industrial-suited all-round solution of sensor and radio technology.

A further benefit for sensor manufacturers is generated by the DATAEAGLE X-treme IO 2730 radio distribution box. It provides the opportunity to make wired sensors "wireless" sensors, which is an advantage at constricted installation sites or installation sites difficult to access. Wireless integration of sensor values into the control unit or cloud is done via the counterpart to the radio distribution box near the control unit, the Wireless Sensor Gateway DATAEAGLE compact 2730 already mentioned above.

FOR MACHINE MANUFACTURERS
Transferring sensor data directly into the control unit

For machine manufacturers, the Wireless Sensor Gateway DATAEAGLE compact 2730 provides great benefit as soon as wireless sensors included in the scope of delivery of the machine are intended to be directly integrated into a control unit. The variety of different Ethernet-based fieldbus interfaces of the DATAEAGLE compact 2730 such as PROFINET, EtherCAT, POWERLINK amongst others enable machine and plant manufacturers easy access to existing control units. The end customer has then immediately available all relevant sensor values in the environment of his control unit together with the remaining data, similar to the Plug & Play principle. As an option, this information can of course also be made available in a cloud.

FOR END CUSTOMERS
Application of sensor technology in Retrofit projects

Producing companies are frequently required to modernize their machinery and for this purpose to refit with various sensors. For such Retrofit projects, the Wireless Sensor Gateway DATAEAGLE compact 2730 provides the possibility to integrate Bluetooth Low Energy sensors into the control unit and to comfortably process in the cloud. Even wireless sensors with
analog or digital signal outputs may be integrated in the same manner: For this purpose, they are made "wireless" prior to using the IO radio distribution box DATAEAGLE X-treme IO 2730, additionally facilitating considerably sensor installation in areas difficult to access.

We are pleased to support you in integrating the sensor together with the gateway DATAEAGLE compact 2730 into the control unit or cloud.

CONNECTING BLUETOOTH SENSORS
Sensor data safely transferred to the control unit

DATAEAGLE compact 2730 provides the user the opportunity to very easily integrate wireless Bluetooth Low Energy sensors in control units. The Bluetooth sensor is once coupled to the gateway for parameterizing the sensor protocol. After that, an unambiguous assignment to the respective sensor via the MAC address is possible, which delivers sensor values to the control unit via a fieldbus protocol then.

CLOUD LEVEL

CONTROL UNIT LEVEL

FIELD LEVEL

OVERVIEW DATAEAGLE 2000
Wireless data transmission at all levels
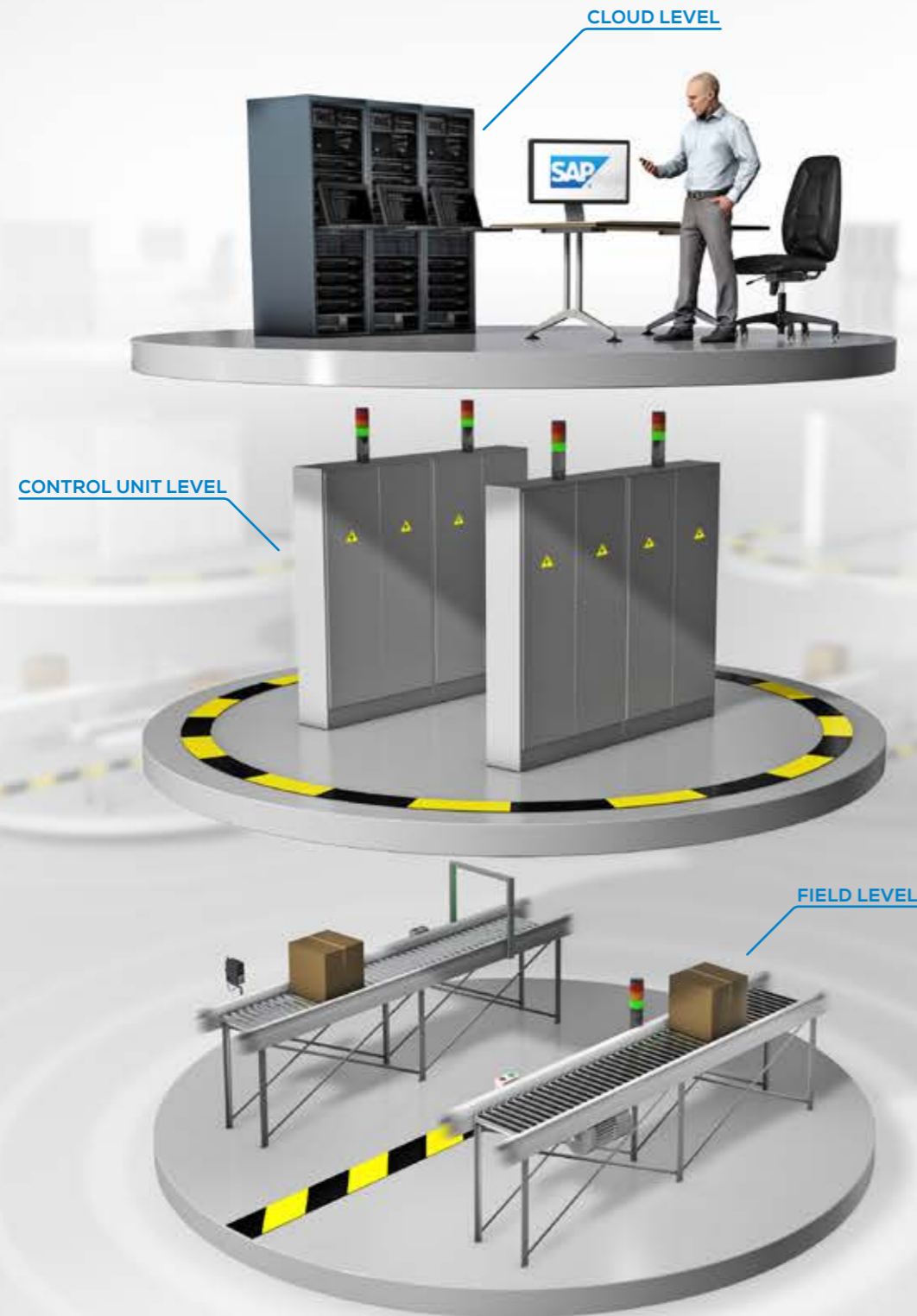
o **CLOUD LEVEL**

Industry 4.0 leads to new business models in the area of production, maintenance and monitoring tasks. Global addressable gateways such as the DATAEAGLE 2730 cloud series, with universal eSIM cards validated by countless providers, play an important role in monitoring globally installed machines and sensors. This allows signals from all over the world and from data sources of all kinds, such as diagnostic messages from large machines or water levels, to be transmitted to the cloud via mobile communications.

1. Wireless Sensor Gateway – DATAEAGLE compact 2730 cloud
2. Wireless Sensor Gateway Mesh – DATAEAGLE compact 2M10 cloud

o **CONTROL UNIT LEVEL**

Often, sensor or machine data are transferred from the field level to the control unit or network for further use. For this, the radio link must be compatible with the communication technology used by the control unit, in most cases a fieldbus. The DATAEAGLE modules compact 2730 are made for this.

1. Wireless Sensor Gateway – DATAEÁGLE compact 2730
2. Wireless Sensor Gateway Mesh – DATAEAGLE compact 2M10

o **FIELD LEVEL**

At the field level, sensor and actuator data of all types are registered or machine data is monitored. Within this level, data can be transmitted wirelessly with the DATAEAGLE X-treme IO 2730 series. First and foremost are the simple point-to-point connections that are used as stand-alone IO systems in many process and manufacturing automation applications and can be expanded into mesh networks with many hundreds of sensors.

1. IO M12-Distribution Box – DATAEAGLE X-treme IO 2730
2. IO M12-Distribution Box – DATAEAGLE X-treme IO 2M10

WIRELESS SENSOR GATEWAY
# DATAEAGLE COMPACT 2730
Via Bluetooth Low Energy directly from the sensor into the control unit

The most widely used application for Bluetooth up to now was and is the connection to smartphones, tablets or PCs. However, in control engineering and automation technology also demand for wireless data transmission of Bluetooth sensors into the control unit is increasing meanwhile. Integration of the "Bluetooth Low Energy" interface into the radio system DATAEAGLE enables to satisfy this wish and to transmit data from Bluetooth sensors directly into the control unit via fieldbuses such as e.g. PROFINET and to process there. Using the radio system DATAEAGLE compact 2730 the user can therefore take advantage of wireless sensors for example at machine parts that are difficult to access; on the other hand he can transmit sensor data to the control unit via Bluetooth Low Energy in a cost-effective and safe manner. The resulting advantage is that data is capable of being directly – without intermediate stop such as e.g. tablets in the hand of persons – sent to the control unit for required processing. This means time saving, safety and cost reduction at the same time.

Advantages and user benefit: DATAEAGLE compact 2730
- Plug & Play: All sensors with Bluetooth Low Energy interface can be used
- Flexibility: The respective used sensor protocol is capable of being parameterized individually
- High range: Safe data transmission via up to 70 meters
- Space-saving: The IP20 gateway enables direct installation in the control cabinet
- Interface into the control unit: Ethernet-based fieldbus protocols integrated
- Wireless Sensor Network: Simultaneous data exchange for up to eight sensors per gateway

CONNECT WIRELESS SENSORS TO THE CONTROL UNIT VIA BLUETOOTH LOW ENERGY

Control Unit · Ethernet · DATAEAGLE compact 2730 · Bluetooth Low Energy · Wireless Sensors

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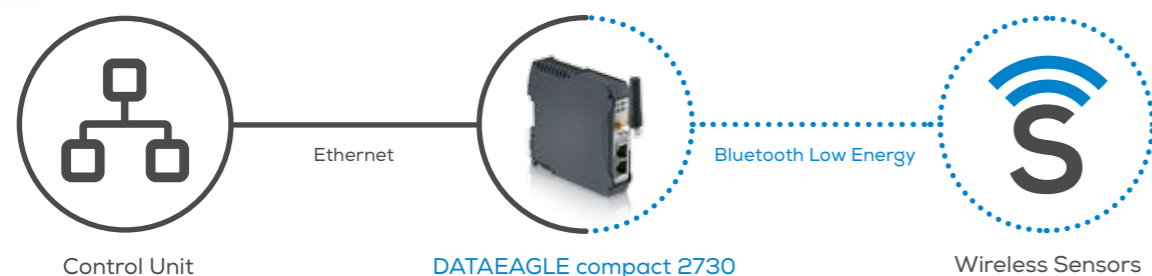
MAKE YOUR SENSORS WIRELESS
DATAEAGLE X-TREME IO 2730
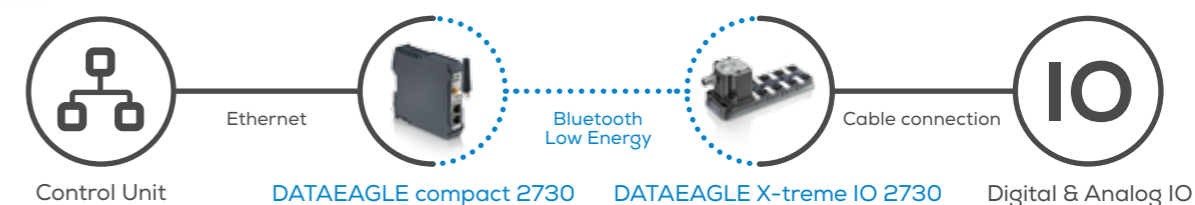The easiest "Bluetooth Low Energy" interface for cable sensors

No radio sensors in your plant yet? The IO radio distribution box DATAEAGLE X-treme IO 2730 extends each analog or digital sensor by a Bluetooth Low Energy interface, enabling to connect any wired sensors to the IO radio distribution box directly at field level and to transmit into the control unit.

DATAEAGLE X-treme IO 2730 is optionally fitted with 4 or 8 M12 connections which are respectively configured as DI or DO and accordingly AI or AO and capable of transmitting digital or analog signals by radio. For transmission, Bluetooth Low Energy is used and this provides for achieving ranges of up to 70 m. Sensor data is then transmitted from the IO radio distribution box to the gateway DATAEAGLE compact 2730; via its fieldbus interface such as e.g. PROFINET data is delivered into the control unit and processed there.

Advantages and user benefit: DATAEAGLE compact 2730 und DATAEAGLE X-treme IO 2730
- Plug & Play: Any sensors with digital or analog signals can be connected to the IO radio distribution box with their standard M12 plug connectors
- High protection class: IP67 enables application directly in the field near sensors
- High range: Safe data transmission via up to 70 meters
- Space-saving: construction of the IP20 gateway DATAEAGLE 2730 enables direct installation into the control cabinet
- Interface into the control unit: Many Ethernet-based fieldbus protocols available
- Wireless Sensor Network: Simultaneous data exchange with up to eight IO radio distribution boxes using a gateway DATAEAGLE compact 2730

TRANSMITTING DIGITAL AND ANALOG IO SIGNALS INTO THE CONTROL UNIT BY RADIO

Control Unit · Ethernet · DATAEAGLE compact 2730 · Bluetooth Low Energy · DATAEAGLE X-treme IO 2730 · Cable connection · Digital & Analog IO

DATAEAGLE COMPACT 2730
Technical data

GENERAL

Voltage supply	24 V DC
Connection voltage supply	Terminal clamps
Power consumption	200 mA
Fixing	DIN rail mounting
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE, FCC
Weight	130 g
Width	22,5 mm
Height	99 mm
Depth	114,5 mm
Colour	Black

RADIO TECHNOLOGY

Frequency	2,4 GHz Bluetooth (Bluetooth 4.2)
Transmitting power	4 dBm
Range	Up to 70 m

INTERFACE

Interface	RJ 45
2-port Switch	Yes
Fieldbus	EtherCAT
	Ethernet/IP
	Modbus TCP
	ETHERNET POWERLINK
	PROFINET
	VARAN
	sercos

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DATAEAGLE X-TREME IO 2730
Technical data

GENERAL

Voltage supply	24 V DC
Connection voltage supply	M12 (male) 5 pole, A-coded, short-circuit and overload protected
Power consumption	100 mA
Fixing	Screw fastening
Protection class	IP67
Temperature range	-20...+70 °C
Conformity	CE, FCC, SRRC, EAC
Weight	150 g
Width	51 mm
Height	150 mm
Depth	65 mm
Colour	Black

RADIO TECHNOLOGY

Frequency	2,4 GHz Bluetooth (Bluetooth 4.2)
Transmitting power	4 dBm
Range	Up to 70 m

INTERFACE

IO Interface	4 x / 8 x M12 (female) 5-pole, A-coded
Sensor-system/actuator supply	Max. 1A Σ
Digital inputs (DI)	PNP
Digital outputs (DO)	PNP (max. 200 mA / Output)
Analog inputs (AI)	0-10 V or 4...20 mA
Analog outputs (AO)	0-10 V or 4...20 mA

VARIANTS

8 DI

8 DO

8 AI (0-10 V)

8 AI (4-20 mA)

4 DI / 4 DO

4 AI / 4 AO (0-10 V)

4 AI / 4 AO (4-20 mA)

↑ Other variants on request

WIRELESS SENSOR GATEWAY CLOUD
DATAEAGLE COMPACT 2730 CLOUD
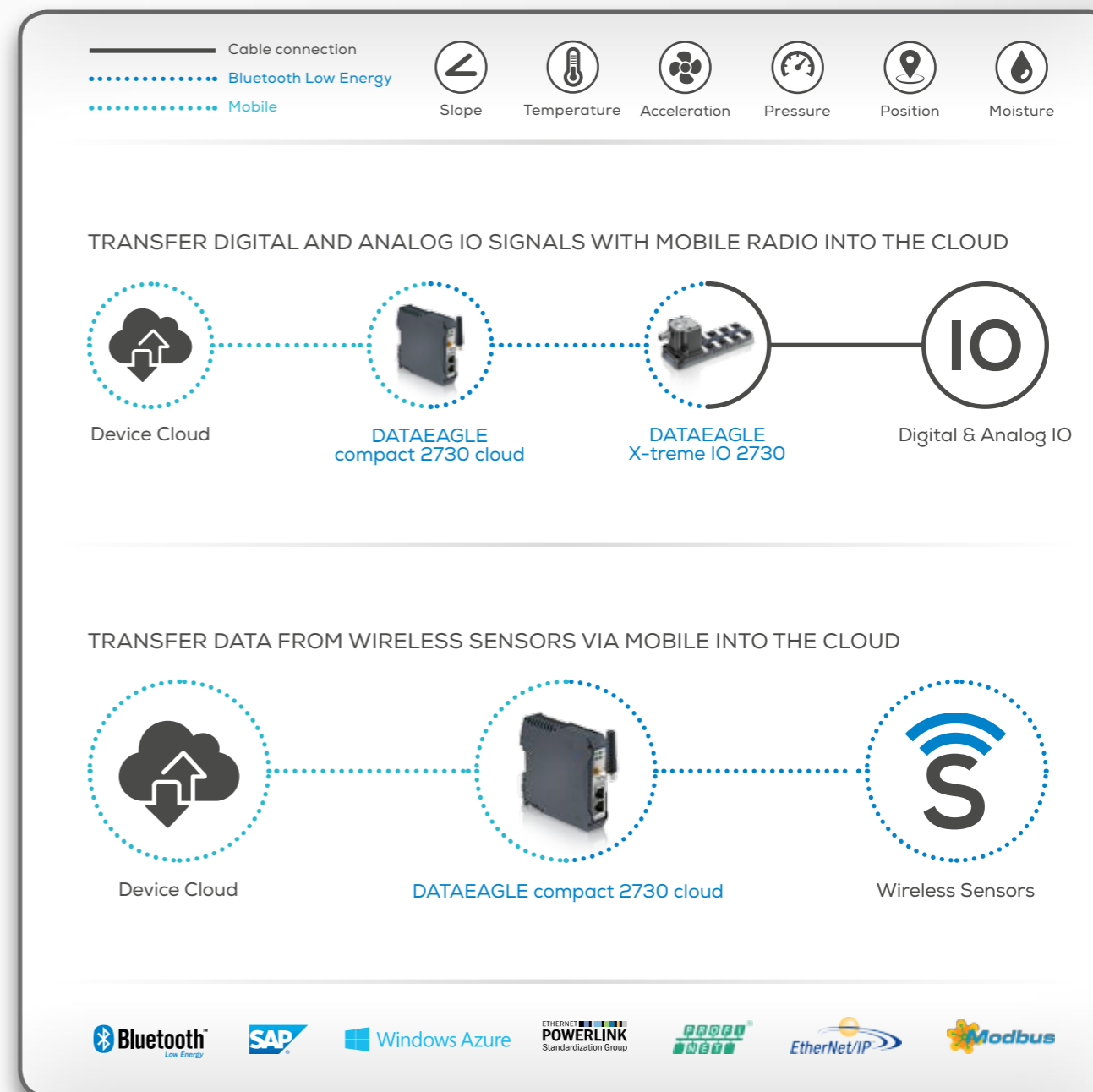Connecting wireless sensor networks with the cloud

Thanks to the optional mobile radio interface the Wireless Sensor Gateway DATAEAGLE compact 2730 cloud enables direct transmission of sensor data via mobile radio into the cloud. Via the Bluetooth Low Energy interface wireless sensors are connected to the DATAEAGLE compact 2730 cloud.

Owing to the globally applicable eSIM card of the DATAEAGLE compact 2730 cloud plants and systems can be networked throughout the world. This makes the Wireless Sensor Gateway the perfect way of analyzing sensor data in real-time as well as an excellent solution e.g. for remote monitoring of systems with regard to timely identification of effects of component fatigue. This creates new business models for the user in the form of services for their customers, for example reduction in operating costs by data analysis or improvement of products and services.

Thanks to data pre-processing in the IoT Edge Gateway DATAEAGLE compact 2730 cloud data volumes are minimized, enabling for only low mobile radio costs – and independently of the respective place of action – at flat tariff. Mobile radio features the highest network coverage throughout the world and provides for easy billing and precisely according to measuring point. Numerous options such as 2G, 3G, 4G, LoRA or Mesh stand for flexibility of the data radio system DATAEAGLE compact 2730 cloud. In the associated online portal, the Device Cloud, devices can be managed as well as data forwarded to a data cloud or an ERP system via an API interface.

Advantages and user benefits: DATAEAGLE compact 2730 cloud
o Plug & Play: Owing to the radio standard Bluetooth Low Energy all sensors with
  Bluetooth Low Energy interface can be used
o Flexibility: The respective sensor protocol applied can be parameterized individually
o Ready for operation throughout the world: Thanks to the global eSIM card applied
  in the gateway, it can directly gather sensor data in more than 130 countries
o Device Cloud: All sensors can be monitored and managed in the online portal at a glance
  as well as interfaces to other cloud portals established via RESTful API

Cable connection
Bluetooth Low Energy
Mobile

Slope | Temperature | Acceleration | Pressure | Position | Moisture

TRANSFER DIGITAL AND ANALOG IO SIGNALS WITH MOBILE RADIO INTO THE CLOUD

Device Cloud | DATAEAGLE compact 2730 cloud | DATAEAGLE X-treme IO 2730 | Digital & Analog IO

TRANSFER DATA FROM WIRELESS SENSORS VIA MOBILE INTO THE CLOUD

Device Cloud | DATAEAGLE compact 2730 cloud | Wireless Sensors

DATAEAGLE COMPACT 2730 CLOUD
Technical data

○ **GENERAL**

Voltage supply	24 V DC
Connection voltage supply	Terminal clamps
Power consumption	200 mA
Fixing	DIN rail mounting
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE
Weight	130 g
Width	22,5 mm
Height	99 mm
Depth	114,5 mm
Colour	Black

○ **RADIO TECHNOLOGY**

Frequency	2,4 GHz Bluetooth (Bluetooth 4.2)
Transmitting power	4 dBm
Range	Up to 70 m

○ **CELLULAR (OPTIONAL)**

3G EU	2G 900MHz / 1800 MHz; UMTS B1, B8
3G EU + WiFi	2G 900MHz / 1800 MHz; UMTS B1, B8; 802.11 b/g/n
3G US	2G 850 MHz / 1900 MHz; UMTS B2, B5
3G World	2G 850 MHz / 900MHz / 1800 MHz / 1900 MHz; UMTS B1, B2, B5, B6, B8, B19
4G	Coming soon

○ **INTERFACE**

Interface	RJ 45
2-port Switch	Ja
Fieldbus	EtherCAT
	Ethernet/IP
	Modbus TCP
	ETHERNET POWERLINK
	PROFINET
	VARAN
↑	sercos

DATAEAGLE X-TREME IO 2730
Technical data

○ **GENERAL**

Voltage supply	24 V DC
Connection voltage supply	M12 (male) 5 pole, A-coded, short-circuit and overload protected
Power consumption	100 mA
Fixing	Screw fastening
Protection class	IP67
Temperature range	-20...+70 °C
Conformity	CE, FCC, SRRC, EAC
Weight	150 g
Width	51 mm
Height	150 mm
Depth	65 mm
Colour	Black

○ **RADIO TECHNOLOGY**

Frequency	2,4 GHz Bluetooth (Bluetooth 4.2)
Transmitting power	4 dBm
Range	Up to 70 m

○ **INTERFACE**

IO Interface	4 x / 8 x M12 (female) 5-pole, A-coded
Sensor-system/actuator supply	Max. 1A Σ
Digital inputs (DI)	PNP
Digital outputs (DO)	PNP (max. 200 mA / Output)
Analog inputs (AI)	0-10 V oder 4...20 mA
Analog outputs (AO)	0-10 V oder 4...20 mA

○ **VARIANTS**

8 DI
8 DO
8 AI (0-10 V)
8 AI (4-20 mA)
4 DI / 4 DO
4 AI / 4 AO (0-10 V)
4 AI / 4 AO (4-20 mA)

↑ Other variants on request

WIRELESS SENSOR GATEWAY MESH DATAEAGLE COMPACT 2M10
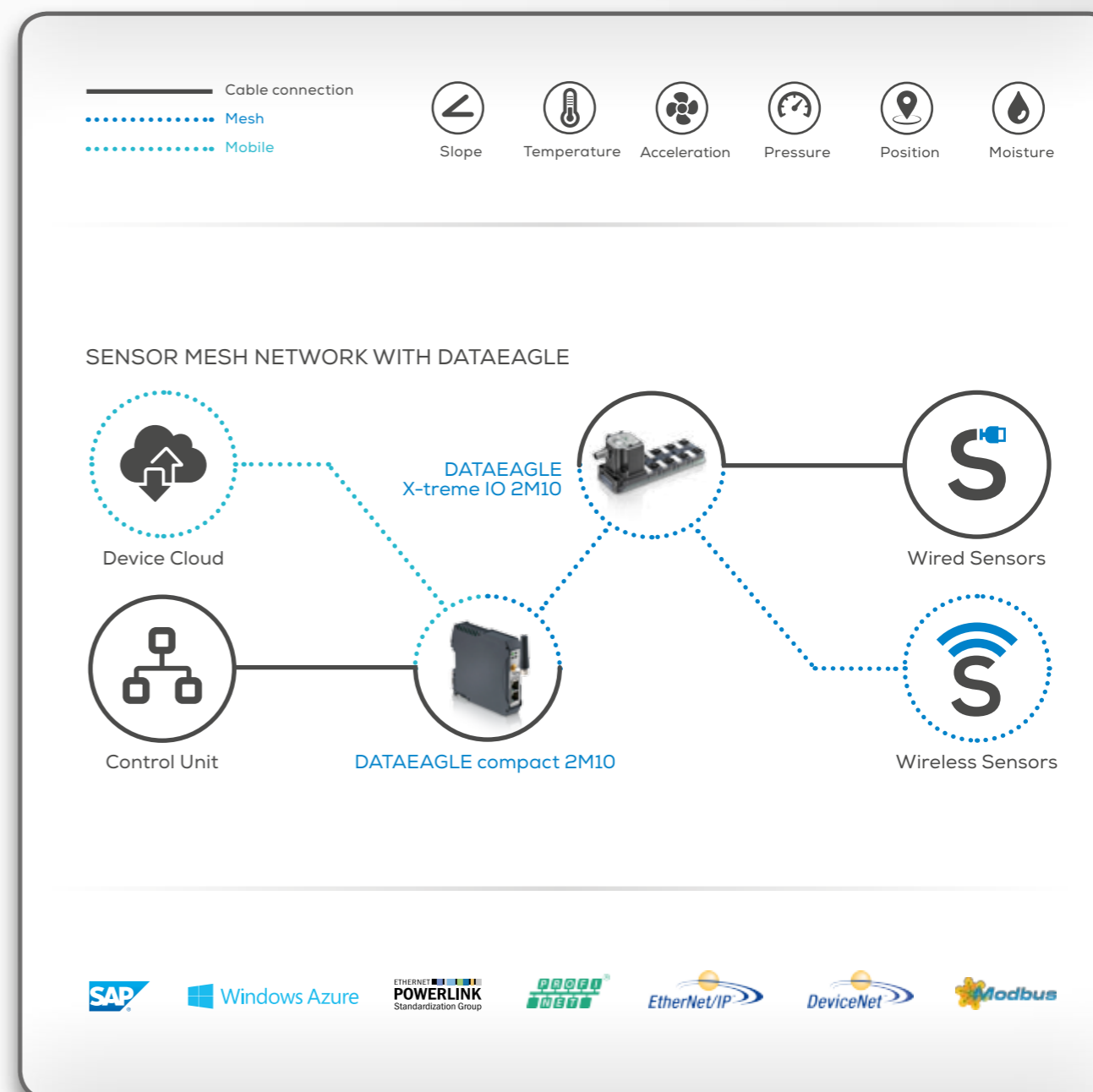
Sensor networks with many radio nodes and high range

Mesh radio networks are capable of transmitting data via up to 1000 radio nodes within the network. The particularity here is self-organization of the routing distance: in contrast to WirelessHART, no additional coordinator is required here. Special radio modules, integrated in sensors, enable wireless sensor-mesh networks. The gateway DATAEAGLE compact 2M10 receives this data wireless from a network consisting of many different sensors, processes data and then forwards it to the control unit via different fieldbus protocols.
For wired sensors it is possible to integrate them via the IO radio distribution box DATAEAGLE X-treme IO 2M10.

As transmission technology, a special mesh-capable radio technology based on 868MHz or 2.4 GHz is applied. This radio technology is also excellently suitable as a direct radio interface for sensors since they are optimized for low energy consumption and a high range. It is possible to integrate up to 128 radio participants. As an option, this system can also be linked with the cloud. Data is available in a central online portal (Device Cloud) then from where it can be transmitted into a data cloud or a customer portal.

Advantages and user benefits: DATAEAGLE compact 2M10

- Wireless Sensor Mesh Network: Up to 128 radio nodes can be integrated as a wireless sensor or DATAEAGLE X-treme IO 2M10
- High range: The maximum range between two radio nodes is 70 meters
- Low energy consumption: Radio technology is suitable for being integrated in wireless sensors
- Integration into the control unit: all common Ethernet-based fieldbuses are integrated in the Gateway DATAEAGLE compact 2M10 as an interface
- Applicable throughout the world: Thanks to the global eSIM card applied as an option, it can directly gather data in more than 130 countries

—— Cable connection	
···· Mesh	
···· Mobile	

Slope Temperature Acceleration Pressure Position Moisture

SENSOR MESH NETWORK WITH DATAEAGLE

Device Cloud

DATAEAGLE X-treme IO 2M10

Wired Sensors

Control Unit

DATAEAGLE compact 2M10

Wireless Sensors

DATAEAGLE
COMPACT 2M10
Technical data

GENERAL

Voltage supply	24 V DC
Connection voltage supply	Terminal clamps
Power consumption	200 mA
Fixing	DIN rail mounting
Protection class	IP20
Temperature range	-20...+60 °C
Conformity	CE
Weight	150 g
Width	22,5 mm
Height	99 mm
Depth	114,5 mm
Colour	Black

RADIO TECHNOLOGY

Frequency	868 MHz / 2,4 GHz Wireless Mesh
Transmitting power	10 dBm (868 MHz) / 1dBm (2,4 GHz)
Range	Up to 70 m

CELLULAR

3G EU + WiFi	2G 900MHz / 1800 MHz; UMTS B1, B8; 802.11 b/g/n
3G US	2G 850 MHz / 1900 MHz; UMTS B2, B5
3G World	2G 850 MHz / 900MHz / 1800 MHz / 1900 MHz; UMTS B1, B2, B5, B6, B8, B19
4G	Coming soon

INTERFACE

Interface	RJ 45
2-port Switch	Yes
Fieldbus	EtherCAT
	Ethernet/IP
	Modbus TCP
	ETHERNET POWERLINK
	PROFINET
	VARAN
	sercos

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DATAEAGLE
X-TREME IO 2M10
Technical data

GENERAL

Voltage supply	24 V DC
Connection voltage supply	M12 (male) 5 pole, A-coded, short-circuit and overload protected
Power consumption	100mA
Fixing	Screw fastening
Protection class	IP67
Temperature range	-20...+70 °C
Conformity	CE, FCC, SRRC, EAC
Weight	150 g
Width	51 mm
Height	150 mm
Depth	65 mm
Colour	Black

RADIO TECHNOLOGY

Frequency	868 MHz / 2,4 GHz Wireless Mesh
Transmitting power	10 dBm (868 MHz) / 1dBm (2,4 GHZ)
Range	Up to 70 m

INTERFACE

IO Interface	4 x / 8 x M12 (female) 5-pole, A-coded
Sensor-system/actuator supply	Max. 1A Σ
Digital inputs (DI)	PNP
Digital outputs (DO)	PNP (max. 200 mA / Output)
Analog inputs (AI)	0-10 V oder 4...20 mA
Analog outputs (AO)	0-10 V oder 4...20 mA

VARIANTS

8 DI

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8 AI (4-20 mA)

4 DI / 4 DO

4 AI / 4 AO (0-10 V)

4 AI / 4 AO (4-20 mA)

↑ Other variants on request

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