Secure Bluetooth instrumentation Advance with confidence





The power of Bluetooth in your plant

Bluetooth has been part of our domestic lives for many years and is now gaining a foothold in industrial applications.

The technology was developed to cover a wide range of applications, from consumer electronics to industrial processes. Bluetooth enables control and measuring instruments to be accessed remotely, making it easy to monitor and maintain devices that are located in hard-to-reach areas.

What are the advantages of using Bluetooth in your plant?

- Fast and wireless configuration and interface
- Standard communication cabling, e.g. 4-20mA, is unaffected
- Faster communication than HART
- Remote instrument access from a safe working area
- No need to open the device housing to set up the instrument advantageous in hazardous areas
- No driver or software installation needed
- No need to connect at the control panel and disturb the loop, making the process much safer

One app for device configuration

Commissioning devices or checking diagnostic information is easier than ever thanks to Bluetooth.

The Bluetooth-enabled device connects to Endress+Hauser's SmartBlue app using a phone or tablet, giving you quick and easy access to the device diagnostics and process information. It's ideal for hazardous or difficult-to-access areas, as you can choose a safe place within a radius of up to 20 metres around the device to run the app, and all your data is to hand in real time.

To download the app on Apple and Android:



The advantages of SmartBlue:

- Time-saving: quick access to the sensor without specific tools or cables
- Ease of use: intuitive menu and guided commissioning
- Availability: diagnostics and real-time process information are always available
- Expandable: No limit on the number of connected devices
- Data security: your data is protected with Endress+Hauser's extra security layer, CPace

Top-level security for your devices and data

As interest in convenient wireless access to field instruments has grown, so have the concerns around data security. As more and more sensors can be configured remotely via Bluetooth, the protocols used must be secure to guarantee operation in an industrial environment.

What is important to consider when integrating Bluetooth in industrial applications?

- Security against unauthorised access
- Eavesdropping/listening attacks must be unsuccessful even with weak passwords
- Phishing attacks must not reveal sensitive information
- Data found in a stolen or lost smartphone must not reveal any information about access to the measuring device
- Data found in a stolen measuring device must not reveal any information about access to it

A secure method developed by Endress+Hauser

In response to these concerns, cryptography experts at Endress+Hauser have developed the CPace standard, which uses simple passwords to provide a level of protection approaching that of certificate-based systems. With the security level almost comparable to that of passports or European identity cards, Endress+Hauser offers the highest level of Bluetooth security on the market.

Award-winning technology

The CPace method has the potential to eventually protect internet-based applications well beyond the process industry. CPace has been recommended by the Internet Engineering Task Force (IETF), which oversees the standardisation of internet communication protocols, after it carried out a comprehensive security analysis. The protection level offered by CPace has also been classified as 'high' by the Fraunhofer Institute for Applied and Integrated Security in Germany.



The benefits of Endress+Hauser's secure Bluetooth connection

- Increased usability, time-efficiency and security of your plant when using Bluetooth-enabled devices
- Secure use of passwords in industrial plants independent of the password length
- Usage independent of device type and power specifications
- Prevention of phishing and man-in-the-middle attacks
- Stronger security than other solutions in standard use: Endress+Hauser's solution is recommended by IETF

Remote asset management in ATEX zones

Field Xpert industrial tablets for device configuration allow remote management of devices in potentially explosive areas (Ex zone 2 for the SMT70 and Ex zone 1 for the SMT77), as well as non-hazardous areas (SMT50). All three make it quick and easy to commission and maintain devices and document your progress by connecting to field devices wirelessly using Bluetooth. The instruments can then be configured and managed during their entire life cycle, which results in time and cost savings for each device. The tablets are ready to go, right out of the box with intuitive, pre-installed software and access to Endress+Hauser's digital service, Netilion.



Range of devices

Endress+Hauser offers a comprehensive range of sensors with Bluetooth functionality. All configurable remotely and in complete safety!

Pressure

Absolute and relative pressure sensors Cerabar PMP51/71B and PMC51/71B

Available with either metallic or ceramic measuring cells, the Cerabar pressure transmitter is suitable for even the most demanding applications. Highly stable, abrasion resistant and suitable for full vacuum applications, the Ceraphire ceramic measuring cell also provides outstanding pressure shock resilience. For applications with high pressures or temperatures, a metallic measuring cell can be specified in a choice of materials. For applications with regular temperature fluctuations, the patented TempC membrane can be used for increased accuracy.





Differential pressure sensors Deltabar PMD55B, PMD75B and PMD78B

The flexible Deltabar differential pressure transmitters, available for direct connection to impulse lines or specified with capillary diaghragm seals, can be utilised to monitor pressure, level or, when used with a primary element, flow. Available with standard process connections and by request non-standard connections for replacing alternative devices, the Deltabar instrument can be used widely across many on-site applications.

Accessible via the SmartBlue app, the Cerabar and Deltabar range of pressure transmitters feature intuitive set-up wizards to help with commissioning, SIL set-up and proof testing procedures. With easy-to-follow guided sequences, these operations can be performed quickly, from up to 5 meters away, without having to remove the instruments from your process.

Example of a quick configuration of a pressure transmitter:



Select your device from the list of Bluetooth devices within range



A general overview of device information is displayed

PTX-3327	PV 0.979 bar SV 19.1 °C
Terminal voltage 1	
12.2 V	
Terminal current	
8.66 mA	
Electronics temperat	ure
18.2 °C	
Pressure	
0.979 bar	
Scaled variable	
48.95 %	
Sensor temperature	
19.1°C	

Navigate to additional details such as terminal voltage and scaled variable

Configuration report		Endress+Hauser		
Device information / Device information				
Status signal	CK.	Primary variable (PV)	1.018 bar	
Secondary variable (SV)	19.8 °C			
Diagnostics / Active dia	gnostics / Active diag	nostics		
Active diagnostics		Timestamp	0d00h00m00h	
Previous diagnostics		Timestamp	0400h00m00s	
Operating time from				
restart	18402h57w48s	Operating time	135418h58m29s	
Diagnostics / Event log	book / Event logbook			
Diagnostics / Minimum Pressure min	/maximum values / N 0.982 bar	linimum/maximum values Pressure max	1.032 bar	
Counter limit undersuns		Counter limit overnuns		
sensor Prein	0	sensar Pmax	D	
Minimum senser		Maximum sensor		
temperature	15.1 %	temperature	29.1 %	
Counter limit overruns		Counter limit underruns		
sensor Treas	0	sensor Tmin	0	
Minimum terminal voltage	11.2 V	Maximum terminal voltage	22.2 V	
Minimum electronics		Maximum electronics		
temperature	14.7 °C	temperature	30.0 %	
Diagnostics / Simulatio	n / Simulation			
Simulation	011			
Diagnostics / Heartbeat	Technology / Hearth	eat Verification / Heartbeat W	rification	
		Operating time		
Start verification	Cancel	(Verification)	1d04h59m39s	

Quickly create an easily downloadable configuration report

Level

Vibrating fork level switches Liquiphant FTL51B, FTL62 and FTL64

Specialised for process industries and already developed according to IEC 61508, the Liquiphant can be used directly in SIL2 and SIL3 applications. As you carry out the proof test, you can connect with Bluetooth to use the guided wizard in the app. The step-by-step instructions walk you through the procedure. Once completed you receive a test report in PDF format for your safety records. The Liquiphant is unaffected by fluctuations in product properties, flow rates, turbulence, gas bubbles, foam, vibration and clogging. The FTL62 version also offers anti-corrosion coatings (Enamel, PFA, ECTFE) and FTL64 allows use at high pressures and temperatures (100 bar / +280°C).



The new Liquiphant's Heartbeat verification wizard allows you to monitor the condition of the device securely over Bluetooth without process interruption. Using our free SmartBlue app you can document the verification results to get an early indication of corrosion or build-up, giving you the opportunity to replace or clean the device before it fails.



Free space radars Micropilot FMR5x, FMR6x

Micropilot FMR5x and FMR6x free space radars offer maximum reliability due to Multi-Echo Tracking and Heartbeat Technology, which includes continuous self-diagnostics and in situ verification without process interruption. The FMR62 is the first 80GHz radar developed according to the international functional safety directive IEC 61508, and for aggressive media it has extraordinary advantages with its PTFE filled flush-mounted antenna and small beam angle. The integrated PEEK antenna version allows very small process connections. Safety and reliability of your measurement can be further improved with optional foam and build-up detection.

Radar transmitters require commissioning after installation. This can be challenging when using the push buttons on the instrument or remotely over the loop. Our free SmartBlue app allows you to adjust parameters securely over Bluetooth and extract data from the device in situ, which can assist with any subsequent support queries.

Guided wave radars Levelflex FMP5x

Levelflex FMP5x is the instrument for level measurement even under extreme process conditions like foam, dust or steam. It offers maximum reliability even in the case of turbulent surfaces or when numerous tank baffles interfere with the measurement. Levelflex is used for continuous level measurement of liquids, solids and slurries and can also be used to track the interface between two media. The measurement is not affected by changing media, temperature changes, gas blankets or vapours.





Cost-effective radars Micropilot FMR10 and FMR20

The Micropilot FMR10 and FMR20 are 26 GHz radars. They offer continuous level measurement without contact and are ideal for a large number of applications in the water sector and in storage tanks. These fully encapsulated devices are tamper proof and easily configured with your mobile device using a secure Bluetooth connection. Thanks to a unique RF electronic component, both devices are very compact and install easily in tight spaces.

Flow

Promag 10 electromagnetic flowmeter Promag W 10, P 10, H 10 and D 10

Compatible with the W, P, H and D sensors, the Promag 10 is ideally suited for basic flow applications of conductive liquids in all industries. Reduce time spent commissioning by utilising the set-up wizards via the SmartBlue app or through the auto-rotating, touchscreen display, both of which can also be used to initiate the integrated self-verification. The Promag 10 is available with 4-20mA HART, pulse or Modbus RS485 output options for seamless integration as well as ATEX approvals (Promag P sensor only) for installation in hazardous areas. The Promag 10 is also ideal for installation in tight spaces with the patented 0xDN full bore option, maintaining accuracy without the need for inlet runs or suffering pressure loss.





Promass 10 Coriolis flowmeter Promass K 10

Available in line sizes from DN08 to DN80, the new Promass K 10 is an economical Coriolis flowmeter for the measurement of mass and volume flow as well as density. The Promass K 10 offers excellent accuracy on both liquids (up to $\pm 0.15\%$) and gases (up to $\pm 1\%$) in a user-friendly package with features such as Heartbeat Technology – for continuous diagnostics and quick self-verification – as well as a touchscreen display. ATEX approvals are available for installation in hazardous areas and the Promass K is equipped with Endress+Hauser's Gas Fraction Handler for stable measurement even in the presence of entrained gas.

The Proline 10 range of Promass and Promag flowmeters is available with Bluetooth technology for simple commissioning via the free SmartBlue app. The integrated set-up wizards quickly guide the user through the commissioning process to reduce set-up time whilst ensuring correct configuration.

Flowmeter for utility monitoring Picomag

Endress+Hauser's Picomag is a compact electromagnetic flowmeter, ideal for the monitoring of water usage. The large colour display can show two values from temperature, conductivity, instantaneous flow and total flow, which can then be transmitted over 4-20mA, pulse or IO-Link via the 2 freely configurable outputs. Setup is simple using the same SmartBlue app as the rest of our Bluetooth-enabled products.



The SmartBlue app is free to download and can be used to quickly communicate with the Picomag via Bluetooth for straightforward commissioning.

Temperature

Temperature transmitters iTEMP TMT71, TMT72 and TMT142B

Suitable for both RTD and thermocouple inputs, the TMT71 and TMT72 Bluetooth-enabled temperature transmitters can be specified for mounting in the head of a temperature probe or in a control panel. Measurement output is offered via 4-20mA while communication for reparameterisation is available via HART or the SmartBlue app. For transmitter positioning in the field, the TMT142B can be specified with either a protective aluminium or stainless steel housing and includes a backlit display, allowing easy reading of measured values.



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Analysis

Compact single-channel transmitter Liquiline Compact CM82

The Liquiline Compact CM82 is the smallest transmitter for Memosens sensors. Its slender housing measures only 11 cm long and 2 cm wide, including a connection to which you can attach your sensor directly, without a cable. Together with the sensor, it fits into most assemblies and couldn't be easier to install.

Via a uniquely secure Bluetooth connection, you can see all nearby CM82 measuring points on your tablet or smartphone and operate them conveniently from a distance. Also, this facility allows configuration, calibration, diagnostics display (NAMUR NE 107) and simulation.



Handheld multiparameter transmitter Liquiline Mobile CML18

The CML18 allows you to check any measurement point in your installation with Memosens technology. Compatibility with sensors already installed at fixed measuring points guarantees full data consistency between your measurements. Calibration can be performed with the transmitter or via Bluetooth. The device is also equipped with a datalogger to record values and export them later.

UK

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