Viator Bluetooth® HART Interface

HM-PF-BT-EX-010041
HM-PF-BT-GP-010040

Manual

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With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

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1 Introduction

1.1 Content of this Document

This document contains information that you need in order to use your product throughout the applicable stages of the product life cycle. These can include the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

Note

This document does not substitute the software manual and/or instruction manual.

Note

For full information on the product, refer to the software manual and/or instruction manual, and further documentation on the Internet at www.pepperl-fuchs.com.

The documentation consists of the following parts:

- Present document
- Instruction manual
- Datasheet

Additionally, the following parts may belong to the documentation, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Additional documents

1.2 Manufacturer

Pepperl+Fuchs Group Lilienthalstraße 200, 68307 Mannheim, Germany
Internet: www.pepperl-fuchs.com

1.3 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

1.4 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:

Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols

Note

This symbol brings important information to your attention.

Action

1. This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

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2 Overview

The Viator Bluetooth® HART interface (Viator) is a point-to-point modem for temporary connection to HART-enabled field devices and is for use primarily as a configuration management tool. The Viator is an intrinsically safe device, designed for use in explosion-hazardous areas. It can operate approximately 20 hours powered by three internal, replaceable AAA alkaline battery cells.

> **i** **Note**
>
> For HM-PF-BT-EX-010041 only type-proofed batteries are allowed to be used. See the separate instruction manual for detailed information.

The PC host uses an internal Bluetooth® interface or an external Bluetooth® adapter to communicate with the Bluetooth® modem. The modem attaches to a HART field device with 18-inch lead wires terminated in mini-grabber clips.

Optional ViatorCheck software provides a PC-based user interface to monitor and configure operation of the Viator. See chapter 10.

The Viator contains a Class 2 Bluetooth® radio with a range of up to 20 m when used with a Class 1 Bluetooth® adapter on your computer. The operating range can be reduced by interference from other nearby devices transmitting in the 2.4-GHz ISM band. These interference sources include some cordless telephones, wireless networking devices, and even microwave ovens. Interference can prevent the establishment of a Bluetooth® connection and may also cause HART network message retries.

The Viator Bluetooth® interface approvals, certifications, technical data, control drawing, and this document are available at www.pepperl-fuchs.com.

For the most recent version of this document, visit www.pepperl-fuchs.com.

2.1 Intrinsically Safe and General Purpose Models

This manual covers both the intrinsically safe (HM-PF-BT-EX-010041) and general purpose (HM-PF-BT-GP-010040) models of the Viator Bluetooth® HART interface.

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3 Technical Data

HM-PF-BT-EX-010041 & HM-PF-BT-GP-010040

Electrical specifications	
Battery type	3 x AAA-size batteries, 1.5 V DC, alkaline cells, type LR03 **The model HM-PF-BT-EX-010041 should be used only with approved batteries. For a complete list of approved batteries see chapter 3.1.**
Operating duration	approx. 80 h (continuous operation)

Interface	
Physical	Bluetooth® v2.1, Class 2, EDR
Transmitter frequency	2402 ... 2480 MHz (Bluetooth®)
Transmitter radiated power	max. 5.5 dBm
Detection range	20 m in air
Antenna	Integrated omnidirectional

Output	
Signal	HART-compliant trapezoidal wave at 1200/2200 Hz

System requirements	
Hardware requirements	Any PC, PDA, laptop, or other computer with Bluetooth® capability
Operating system	Windows®, Windows® Mobile® or any OS that supports Bluetooth COM port

Ambient conditions	
Operating temperature	-20 ... 50 °C (-4 ... 122 °F)
Storage temperature	-20 ... 60 °C (-4 ... 140 °F)
Relative humidity	0 ... 95%, non-condensing

Mechanical specifications	
Degree of protection	IP20
Connection	HART I/O Interface cable, 0.5 mm² (20 AWG) fine-strand, termination test clips
Material	Polycarbonate
Dimensions	88 mm x 42 mm x 19 mm
Cable length	0.5 m

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General information	
Supplementary information	Observe the certificates, declarations of conformity, instruction manuals, and manuals where applicable. For information see www.pepperl-fuchs.com.

⚠ Danger!

Approved batteries for HM-PF-BT-EX-010041

The model HM-PF-BT-EX-010041 should be used only with approved batteries. For a complete list of approved batteries see chapter 3.1.

3.1 Approved batteries for HM-PF-BT-EX-010041

The model HM-PF-BT-EX-010041 should be used only with approved batteries. See the following list of approved batteries.

Approved Battery List

| Manufacturer	Battery type LR03/AAA
Panasonic	Pro Power
Panasonic	Industrial Powerline LR03AD[1]
Varta	Industrial Pro No. 4003
Energizer	Industrial EN92

1. Marking of the battery shows LR03 only.

4 Markings and Certifications

4.1 Intrinsically Safe Model (HM-PF-BT-EX-010041) Certifications

Directive conformity	
Radio and telecommunication terminal equipment	
Directive 2014/53/EU	EN 300328 V 2.2.2:2019-07 EN 301489-1 V 2.2.3:2019-11 EN 301489-17 V 3.2.4:2020-09 EN 62311:2008-01 EN 62479:2010-09 EN IEC 62368-1:2020-03
RoHS	
Directive 2011/65/EU (RoHS)	EN IEC 63000:2018-12

Approvals and certificates	
FCC approval	FCC Part 15 B , FCC ID: 2A3WYID7
IC approval	ICES-003, IC: 30237-IDC747

Approvals	
ATEX	
ATEX Certificate	CML 16 ATEX 2379
ATEX Marking	⟨Ex⟩ II 1G Ex ia IIC T4 Ga -20°C ≤ Ta ≤ +50°C
Directive conformity	
ATEX 2014/34/EU	EN 60079-11:2012-01 EN IEC 60079-0/AC:2020-02 EN IEC 60079-0:2018-07
UL approval	
UL approval	Class I, Div. 1 or Div. 2 Groups A, B, C, D T4 Class I, Zone 0, AEx ia IIC T4 Ga; Ex ia IIC T4 Ga
IECEx approval	
IECEx certificate	IECEx CML 16.0138
IECEx marking	Ex ia IIC T4 Ga -20 °C to +50 °C
UKCA approval	
UKCA certificate	CML 21UKEX2638
UKCA marking	⟨Ex⟩ II 1G Ex ia IIC T4 Ga -20 °C ≤ T_{amb} ≤ 50 °C

Danger!

Approved batteries for HM-PF-BT-EX-010041

The model HM-PF-BT-EX-010041 should be used only with approved batteries. See the following chapter for a complete list of approved batteries: see chapter 3.1.

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4.2 General Purpose Model (HM-PF-BT-GP-010040) Certifications

Directive conformity	
Radio and telecommunication terminal equipment	
Directive 2014/53/EU	EN 300328 V 2.2.2:2019-07 EN 301489-1 V 2.2.3:2019-11 EN 301489-17 V 3.2.4:2020-09 EN 62311:2008-01 EN 62479:2010-09 EN IEC 62368-1:2020-03
RoHS	
Directive 2011/65/EU (RoHS)	EN IEC 63000:2018-12

Approvals and certificates	
FCC approval	FCC Part 15 B , FCC ID: 2A3WYID7
IC approval	ICES-003, IC: 30237-IDC747

4.3 Front labels

The serial number label contains the serial number of the device.

An additional label consists of two lines of text. Line 1 (top) contains the Bluetooth name of the device. Line 2 (bottom) contains the manufacturing date of this device.

Label Format	
Line 1:	P+FViator_xxxx[1]
Line 2:	Manufacturing date WWYY

1. last 4 digits of MAC address

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4.4 Rear Label

HM-PF-BT-EX-010041

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68307 Mannheim, Germany   www.pepperl-fuchs.com

Intrinsically Safe Device | À SÉCURITÉ INTRINSÈQUE

PROC.CONT.EQ.FOR USE IN HAZ.LOC.

Cl. I Div. 1 Grps A, B, C, D; T4
Cl. I Div. 2 Grps A, B, C, D; T4
Cl. I, Zn 0, AEx, ia IIC T4 Ga; Ex ia IIC T4 Ga
$-20°C \le Ta \le 50°C$

c UL us LISTED
33R6

Intrinsically safe when installed per Control Drawing 116-B033B.

CE 0102   UKCA 2503   ⟨Ex⟩

II 1G Ex ia IIC T4 Ga
$-20°C \le Ta \le 50°C$
CML 16 ATEX 2379
IECEx CML 16.0138
CML 21UKEX2638

Entity Parameters:
U_i=30V, I_i=130mA, P_i=1W, C_i=0uF, L_i=0mH
U_o=1.8V, I_o=2.5mA, P_o=1.1mW

WARNING / ATTENTION
Use only approved batteries: See instructions manual!
Do not mix old and new batteries
Do not replace batteries when explosive
gas atmosphere may be present.
Utiliser seulement les piles recommandées:
voir le manuel d'instructions
Ne pas mélanger les piles neuves et les piles usées.
Ne pas remplacer les piles dans un environnement où
des atmospheres explosives peuvent se présenter

Contains FCC ID: 2A3WYID7
Contains IC: 30237-IDC747

Figure 4.1

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HM-PF-BT-GP-010040
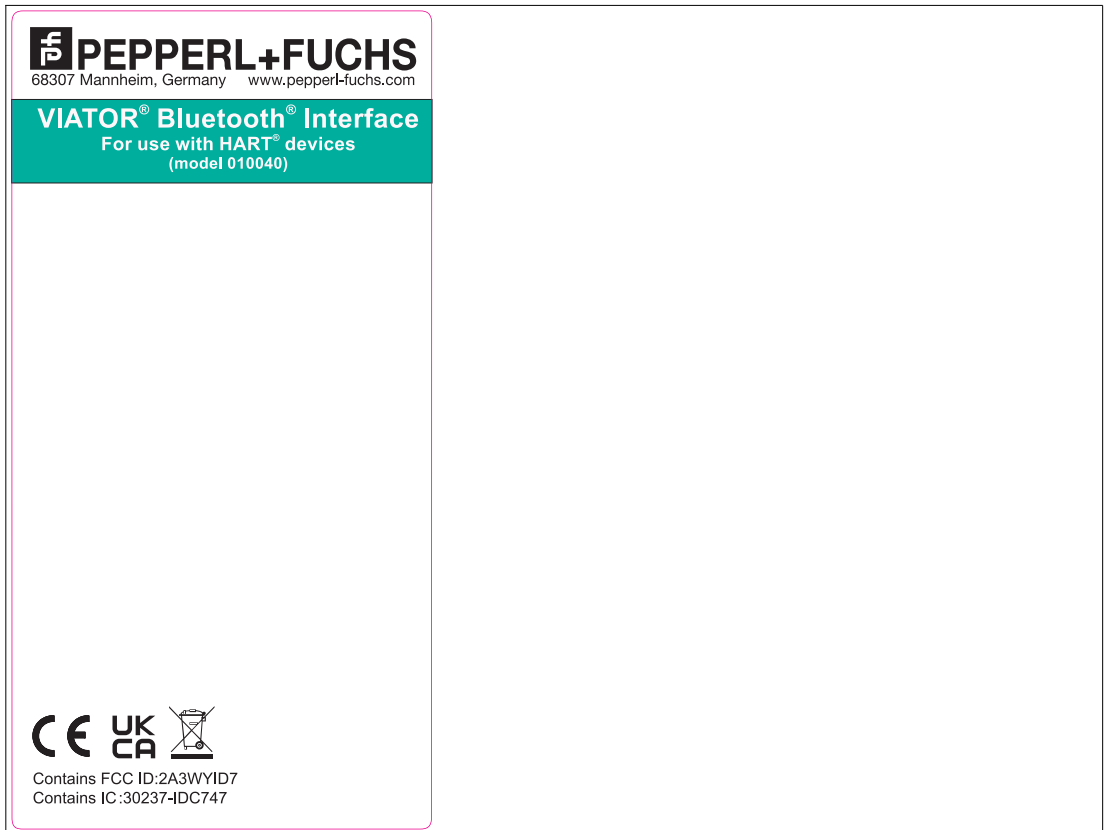
Figure 4.2

Entity parameters are listed on the label.

4.5 FCC Class

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

5 Getting Started

5.1 Hardware and Software Requirements

- Viator Bluetooth® HART interface, HM-PF-BT-EX-010041 or HM-PF-BT-GP-010040
- Computer with built-in Bluetooth® or external Bluetooth® USB adapter
- Windows®, Windows Mobile® or any OS that supports Bluetooth COM port
- HART application software (for example: device configuration or asset management application that includes the device DD, EDD, or DTM for communication with HART instruments)

5.2 Hardware and Software Installation

The Viator connects to your computer over the air using Bluetooth wireless technology. No additional Pepperl+Fuchs hardware is required for the PC. There are no Pepperl+Fuchs-specific drivers or software required to use this product. All communications are handled through the Bluetooth serial port profile. See the documentation supplied with your computer or Bluetooth adapter for installation instructions for those devices.

The Viator is physically connected either across the HART-compliant transmitter or the associated current loop terminating resistor. The Viator HART connections are polarity independent. If the Viator is to be installed in areas classified as a hazardous locations, refer to the control drawing for this model.

Danger!

Danger of explosion!

Observe the applicable laws and regulations in regard to installation of electrical equipment in potentially explosive atmospheres, for example but not limited to IEC/EN 60079-14.

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6 Powering the Viator Bluetooth

6.1 Power Button and Battery Status

The power button controls power to the Viator and is also used to determine the battery status. The Viator is turned on by depressing the power button for a half second. The status indicator lights for 1 second, turn off for a half second, and then blink to indicate the amount of charge left in the batteries:

Number of blinks	Remaining battery power
4	80% or more
3	50% or more
2	30% or more
1	10% or more
0	less than 10% – replace batteries immediately

Depressing the power button briefly while the unit is on will indicate the amount of charge left in the battery.

Turn the Viator off by holding the power button down until the status indicator goes out. This takes about 1 second.

6.2 Under-Voltage Lockout

When the battery voltage drops below the hardware-set shutdown voltage of 2.8 V, the modem will immediately power itself off. The user must replace the batteries. See chapter 6.5.

6.3 Bluetooth® Idle Timeout

The Viator can be configured to automatically drop the Bluetooth® connection after a period of inactivity to conserve battery power. This feature is disabled by default and must be set via the ViatorCheckBT application. See chapter 10.

6.4 Inactivity Power-Down

The Viator will automatically power down to conserve battery life after 30 minutes with no Bluetooth® connection. The power button must be pressed to power up the Viator once the inactivity timeout has expired.

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6.5 Battery Replacement

The Viator Bluetooth® interface requires 3x AAA alkaline batteries (1.5 V DC). For more information see chapter 3.1.

Replacing the Batteries

1. Unscrew the captive screw that secures the battery door into the bottom housing. Fully remove the battery door with the retained captive screw, remove the used batteries, and install new batteries.

Figure 6.1   Replacing batteries

2. Observe the battery polarity embossed in the bottom of the battery compartment for each of the three battery positions. To complete the battery installation, first verify the polarity of the installed batteries as compared to figure below, then reinstall the battery door into the bottom housing with the captive screw.

Figure 6.2   Battery polarity position

Danger!

Explosion hazard.

Do not open or replace battery when flammable or combustible atmosphere is present.

Danger!

Approved batteries for HM-PF-BT-EX-010041

Only the following batteries have been approved for use in explosion-hazardous areas: see chapter 3.1.

Danger!

Do not operate device with battery cover removed.

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Warning!
Do not mix old and new batteries.

Warning!
Disconnect the device leads from measurement circuit before replacing the batteries.

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7 Establishing Communication

The Viator uses the standard Bluetooth® serial port profile (SPP), which is supported by most Bluetooth® hosts. Using SPP creates a virtual serial COM port, which allows the interface to be used with HART applications in a manner similar to traditional, built-in serial COM ports.

The method to connect to Bluetooth® devices varies, depending on the Bluetooth® host software being used. Refer to the documentation for your host PC or Bluetooth® adapter for instructions on establishing an SPP connection.

It is highly recommended that the Microsoft® Bluetooth® Stack be used—this Bluetooth® stack is directly supported by Windows® XP SP2. Many Bluetooth® adapters come with third-party software to handle Bluetooth® communications, but not all are reliable. Some third-party software stacks have issues with opening and closing COM ports, and some HART applications do not work well with in these situations. Our testing has shown that the Microsoft® Stack is the best in this regard.

All Viator Bluetooth® interfaces have a preset Bluetooth® device name in the format of ""P+FViator_xxxx" where "xxxx" represents the last four hexadecimal digits of the Bluetooth® MAC address for the device. The Bluetooth® MAC address is printed above the serial number near the bottom of the front label. You can use this name to help choose the correct device in a busy Bluetooth® environment.

Many Bluetooth® stacks create two COM ports when initially establishing an SPP connection to the Viator. One port is labeled "incoming" and is used if the modem attempts to establish the Bluetooth® connection. The second port is labeled "outgoing" and is used when the computer establishes the Bluetooth® connection. The outgoing COM port number is what will be used by your HART application.

If using the Microsoft® Bluetooth® Stack, after this initial connection is complete, opening and closing the outgoing COM port is all that is needed to start a connection to the Viator interface. This connection setup only has to be performed the first time a Viator interface is used. The operating system stores the PIN and the COM port number even through reboots.

Note

During normal operation, the status indicator blinks once per second. When a Bluetooth® connection is established, the blink rate remains the same but the on time will increase. With a Bluetooth® connection established, the status indicator blinks twice to show loop activity when the Viator is connected to the HART loop.

7.1 Connections from HART Applications

To use the Viator, first power on the device and then start up the HART application. From within the HART application, select the COM port for the HART interface and select the COM port number associated with the outgoing COM port for the Viator. You should now be able to use the interface for HART communications.

7.2 Connection Problems

If there are connection problems, try the following procedure:

1. Exit all HART applications.
2. Power off the Viator.
3. Wait 10 seconds.
4. Power on the Viator.
5. Wait 10 seconds.
6. Start up the HART application and try to open the COM port.

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7.3 Bluetooth® Radio

This product contains a Class 2 Bluetooth® radio module operating in the 2.4 GHz (ISM) band utilizing a frequency hopping spread spectrum (FHSS) scheme. The radio module has a range of up to 20 m.

The operating range can be reduced by interference from other nearby devices transmitting in the 2.4-GHz ISM band. These interference sources include some cordless telephones, wireless networking devices, and even microwave ovens. Interference can prevent the establishment of a Bluetooth® connection and may also cause HART network message retries.

The device complies with FCC 47 CFR, Part 15 rules. Operation is subject to the two following conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesirable operation.

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8 Maintenance and Repair

8.1 Maintenance

The Viator has an IP20-rated housing and may be cleaned by wiping the device down with a soft, damp, lint-free cloth to remove dust and dirt. A mild, non-abrasive soap or detergent may be used if required. An antistatic coating has been applied to the Viator. The coating can either be a Licron Crystal 1756 or a C-300. Follow the manufacturer's recommendations in order to maintain the antistatic properties of the coating, including but not limited to: clean with soap and water, do not use abrasive cleaners, and avoid contact with solvents. Visually inspect the unit prior to each use for damage to the case, test leads, or spring-loaded mini-grabbers and discontinue use if any damage is found.

Warning!

Do not clean device with abrasive or solvent-based cleaners.

Warning!

Do not submerge device in liquid when cleaning.

8.2 Repair

The Viator Bluetooth® interface can only be repaired by authorized Pepperl+Fuchs personnel. For information about obtaining repairservices, refer to the limited warranty provided in section 12 of this manual.

Warning!

Only authorized Pepperl+Fuchs personnel may repair this device.

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9 Installing ViatorCheck Software

To install the ViatorCheck software on your PC, please refer to the ViatorCheck Software User Manual. To download the ViatorCheck Software User Manual and the ViatorCheck Software, visit www.pepperl-fuchs.com.

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