

MANUAL

Viator® Bluetooth® HART Interface

HM-MT-BT-EX-010041
HM-MT-BT-GP-010040



Viator® Bluetooth® HART Interface Manual

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 Safety

1.1 Introduction

1.1.1 Contents

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



Warning!

Failure to follow these instructions may impair the safety protection and function of the equipment.



Note!

For complete information on the product, refer to the instruction manual and further documentation 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 declaration of conformity
- Certificates
- Control drawings
- Additional documents

1.1.2 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator. In accordance with but not limited to IEC/EN 60079-14, only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the product. National laws and regulations must be observed and take precedence over any aspects of IEC/EN 60079-14. The personnel must have read and understood the instruction manual and any further documentation.

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1.1.3 Symbols Used

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

Warning Messages

You will find warning messages in instances where danger may arise from your actions. You must 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

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

1.1.4 Pertinent Laws, Standards, Directives, and Further Documentation

Laws, standards, or directives applicable to the intended use must be observed. In relation to hazardous areas, Directive 1999/92/EC must be observed.

The corresponding datasheets, EU Declaration of Conformity, EU Type Examination Certificates, and control drawings, if applicable (see datasheet), are an integral part of this document. You can find this information at www.pepperl-fuchs.com

Due to constant revisions, documentation is always subject to change. Please refer only to the most up-to-date version, which can be found at www.pepperl-fuchs.com.

1.1.5 Declaration of Conformity

All products were developed and manufactured under observance of the applicable European standards and guidelines.



Note!

A declaration of conformity is included with these instructions and can be requested from the manufacturer or obtained online at www.pepperl-fuchs.com.

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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 hazardous locations. It can operate approximately 20 hours powered by three internal, replaceable AAA alkaline battery cells. 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 1 Bluetooth radio with a range of up to 100 m when used with a Class 1 Bluetooth adapter on your computer. When using a Class 2 Bluetooth adapter, the range will be limited to 10 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 Viator Bluetooth Interface approvals, certifications, technical datasheet, 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-MT-BT-EX-010041) and general purpose (HM-MT-BT-GP-010040) models of the Viator Bluetooth HART Interface.

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3 Markings and Certifications

3.1 Intrinsically Safe Model (HM-MT-BT-EX-010041) Certifications

Europe	
Directive 2014/34/EU (ATEX)	CML 16 ATEX 2379 ⊕ II 1G Ex ia IIC T4 Ga -20°C ≤ Ta ≤ +50°C
Directive 2011/65/EU (RoHS)	EN 50581:2012
Directive 2014/53/EU (radio equipment)	EN 300 328 V2.1.1 EN 301 489-17 V3.1.1

USA and Canada	
UL Listing E106378	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
FCC Part 15B	Contains FCC ID: T9J-RN41-3
IECS-003	Contains IC ID: 6514A-RN413

International	
Certificate IECEx CML 16.0138	Ex ia IIC T4 Ga -20 °C to +50 °C



Danger!

Only the following battery has been approved for use in hazardous locations:
Energizer EN92, AAA, 1.5 VDC

3.2 General Purpose Model (HM-MT-BT-GP-010040) Certifications

Europe	
Directive 2011/65/EU (RoHS)	EN 50581:2012
Directive 2014/53/EU (radio equipment)	EN 300 328 V2.1.1 EN 301 489-17 V3.1.1

USA and Canada	
FCC Part 15B	Contains FCC ID: T9J-RN41-3
IECS-003	Contains IC ID: 6514A-RN413

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3.3 Serial Number Label

The Viator serial number label is located on the front of the device and consists of two lines of text. Line 1 (top) contains the last six characters of the MAC address of the Bluetooth radio followed by the month and year of construction. Line 2 (bottom) contains the eight-digit serial number of this device.

Label Format Line 1: MAC:zzzzzz MM/YY
 Line 2: SN:41xxxxxx

3.4 Rear Label



Entity parameters are listed on the label.

3.5 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.

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4 Technical Specifications

HOST System	
Platform / operating system	Any PC or mobile device with Bluetooth support
HOST interface	Bluetooth 2.0 (version 2.0 EDR – Class 1)
Bluetooth	
Range	Approx. 100 m (109 yds) open air
Operating frequency	2.4 GHz (2402 ... 2480 MHz), 79 channels
RF output power	18 dBm
Antenna	Integrated omni-directional
Electrical	
Batteries ‡	3 AAA, 1.5 VDC alkaline batteries For hazardous-locations: Energizer EN92
Battery life	Approx. 20 hours continuous use
Output level	Fully HART-compliant trapezoidal wave @ 1200/2200 Hz
Device connection	18 in (.45m) minigrabber test clips – reverse polarity protected
Environmental	
Operating temperature	-4 °F to 122 °F (-20 °C to 50 °C)
Storage temperature	-4 °F to 140 °F (-20 °C to 60 °C)
Storage humidity	0 % to 95 % relative humidity non-condensing
Housing	
Dimensions	3.5 in x 1.7 in x .75 in (88 mm x 42 mm x 19 mm)
Material	Polycarbonate
IP Rating	IP20



Danger!

Only the following battery has been approved for use in hazardous locations:
Energizer EN92, AAA, 1.5 VDC

5 Getting Started

5.1 Hardware and Software Requirements

- Viator Bluetooth HART Interface, Model 010041
- Computer with built-in Bluetooth or external Bluetooth USB adapter
- Windows® operating system:
 - Windows XP
 - Windows Vista
 - Windows 7
 - Windows 8
- Viator installation CD with Viator software driver, software utilities, and documentation
- 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 Check Your Viator Bluetooth Package

Your Interface package contains the following items:

- Viator Bluetooth Interface
- Viator installation CD

If any of these items is missing or damaged, please contact Pepperl+Fuchs.

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5.3 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.

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 will light for 1 second, turn off for a half second, and then blink to indicate the amount of charge left in the batteries:

- 4 blinks = 80 % or more battery power remaining
- 3 blinks = 50 % or more battery power remaining
- 2 blinks = 30 % or more battery power remaining
- 1 blinks = 10 % or more battery power remaining
- 0 blinks = less than 10 % battery power remaining – 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 3 1.5 VDC, AAA, alkaline batteries. To replace the batteries, refer to figure 1.1. 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. When installing the batteries, refer to figure 1.2 and 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 1.2, then re-install the battery door into the bottom housing with the captive screw.

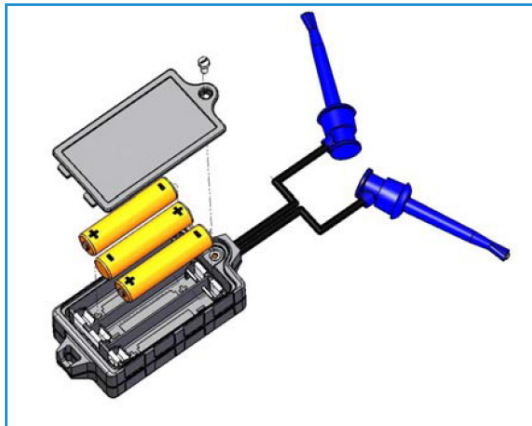


Figure 1.1: Replacing batteries

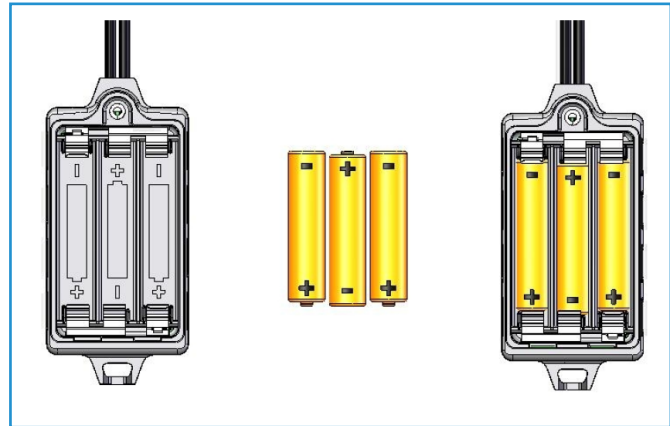


Figure 1.2: Battery polarity position



Danger!

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



Danger!

Only the following battery has been approved for use in hazardous locations:
Energizer EN92, AAA, 1.5 VDC



Danger!

Do not operate device with battery cover removed.



Warning!

Do not mix old and new batteries.



Warning!

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

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 recommend 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 “MACTekVIATOR 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.



When you connect to the Bluetooth modem for the first time, you will need to use a PIN or passkey to establish a connection:

PIN: mactek (all lowercase) or 1234

Many Bluetooth stacks will 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 will store the PIN and the COM port number even through reboots.



Note!

During normal operation, the status indicator will blink once per second. When a Bluetooth connection is established, the blink rate will remain the same but the on-time will increase. With a Bluetooth connection established, the status indicator will blink 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.

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7.2 Connection Problems

If there are connection problems, try the following procedure:



- Exit all HART applications
- Power off the Viator
- Wait 10 seconds
- Power on the Viator
- Wait 10 seconds
- Start up the HART application and try to open the COM port

7.3 Bluetooth Radio

This product contains a Class 1 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 100 m when used with a Class 1 Bluetooth adapter and a 10 m range with a Class 2 Bluetooth adapter.

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.

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 repair services, 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 Viator Utilities and Drivers



Note!

Install utilities and drivers before plugging in the Viator.



To download and install utilities and drivers, visit www.pepperl-fuchs.com.

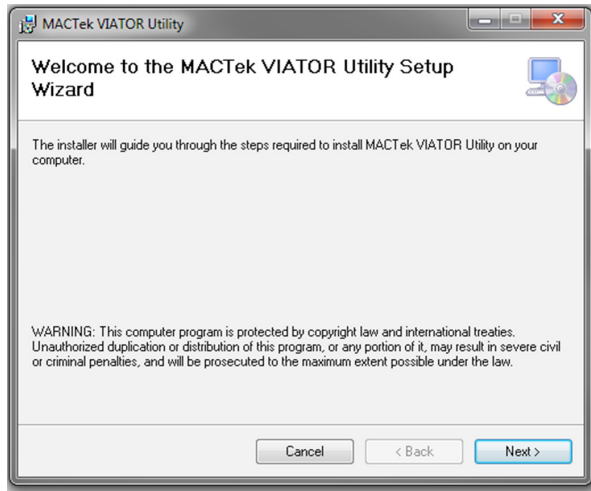
1. Enter your Viator's type code (**HM-MT-BT-EX** or **HM-MT-BT-GP**) into the keyword search box at the upper-right corner of the Pepperl+Fuchs homepage.
2. Select the appropriate product page from the search results.
3. Download the installer from your Viator's product page under the "software" tab.
4. Open the ViatorCheckBT folder and double click the **setup.exe** file to start the installation process.



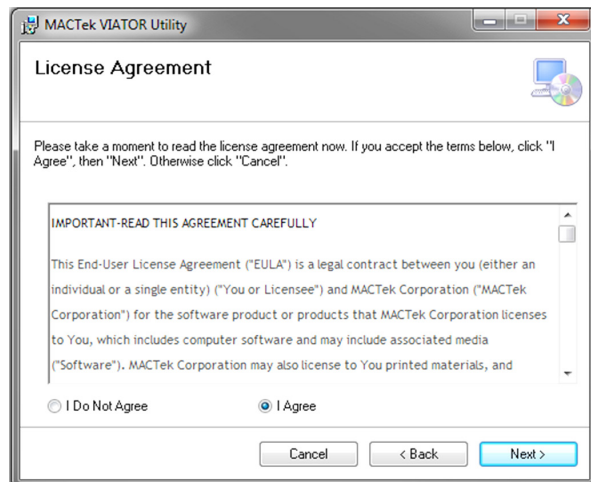
Note!

During installation, screens will appear that prompt you to install documentation, test utilities, and install HART communications software. Installation of all documentation and utilities is optional. Only the MACTek drivers are necessary for proper operation.

5. The preliminary screen will appear. Click **Next >**



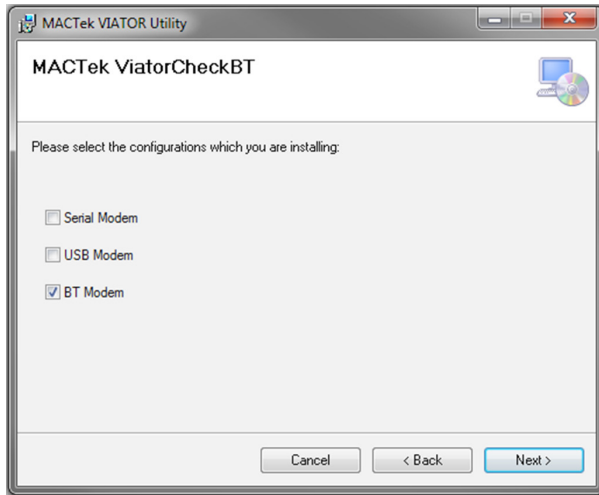
6. The next screen will display the end-user license agreement:



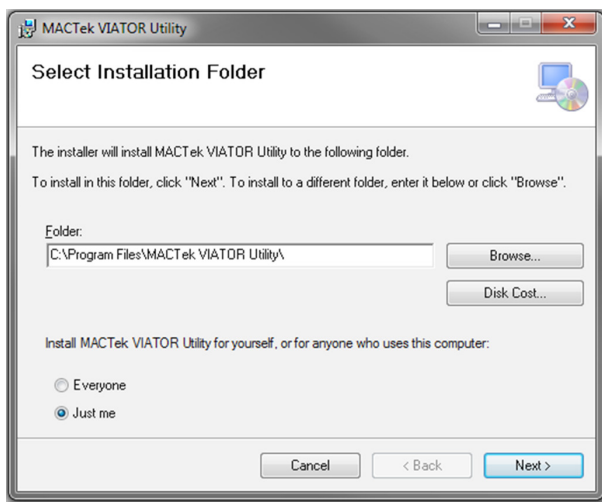
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7. You will then be prompted to select which HART Interface you plan to install.

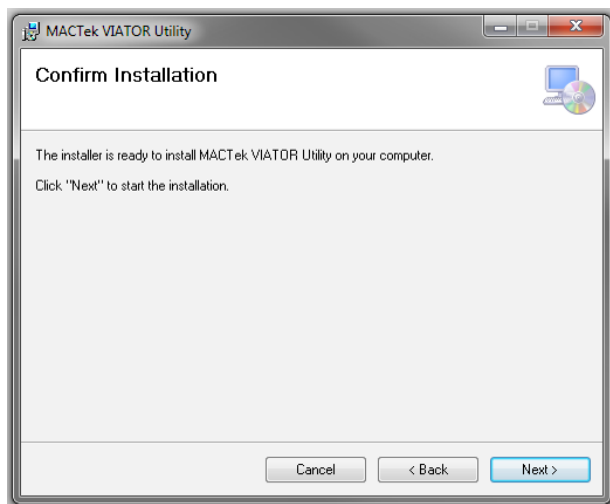
- Select "BT Modem"
- Click **Next >**



8. The next window will allow you to select the folder where you would like to install the utility file.

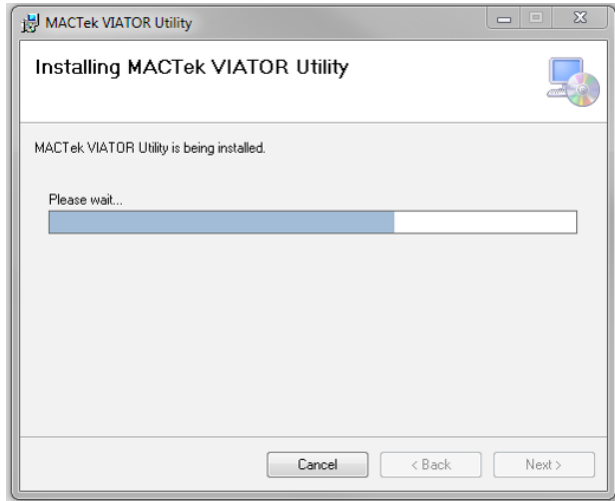


9. After selecting the installation folder, you will be prompted to start the installation.
To confirm installation, click **Next >**

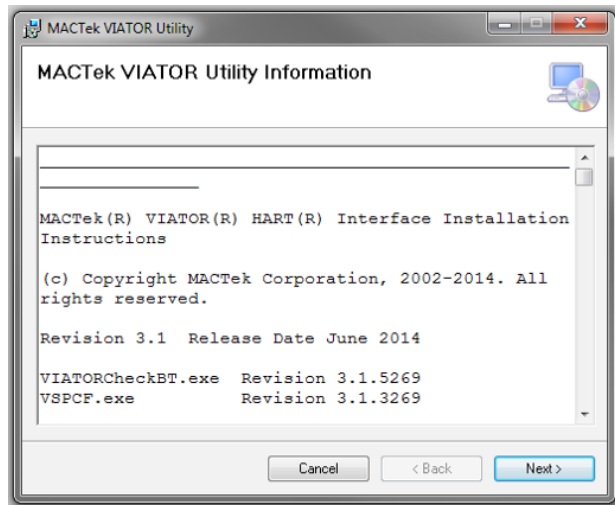


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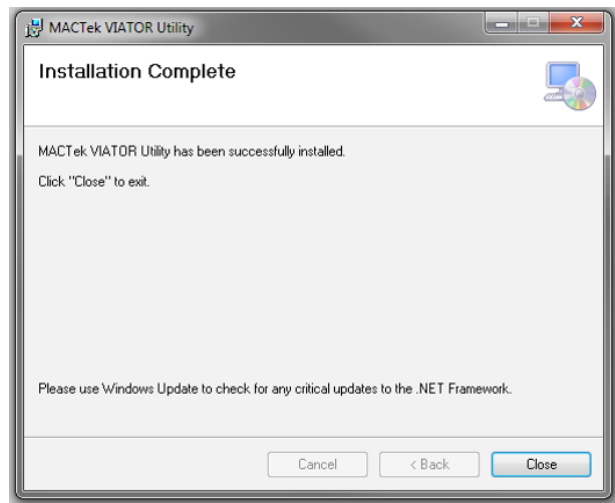
10. The utility will now begin to install:



11. After installation is complete, you will receive an installation report and information on the utility file.
To continue, click **Next >**



12. Installation is now complete.
To exit, click **Close**



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10 ViatorCheckBT™ Software Utility

10.1 Overview

ViatorCheckBT is a diagnostic software utility that can be used with the entire family of Viator interfaces. ViatorCheckBT provides a simple way to test HART connections between a PC with a Viator interface and a field device. ViatorCheckBT also gives you the ability to configure the Viator Bluetooth Interface.

10.2 Installing ViatorCheckBT

10.2.1 System Requirements for Use with Windows

Operating systems supported:

- Microsoft Windows Vista operating system
- Microsoft Windows XP (SP2 recommended) operating system
- Microsoft Windows Server 2003 operating system

Microsoft .NET Framework 2.0 is needed to install the program.

10.2.2 Installation

Use an administrator login to install ViatorCheckBT.



1. Download the Viator installation file from www.pepperl-fuchs.com.
2. Start the installer by running the downloaded exe file.
3. Click **Install ViatorCheckBT**.
4. Follow the prompts on your screen.
5. As part of the installation, the com0com software will be installed. On XP, this will invoke the “Found New Hardware Wizard.” Select **install the software automatically** and, if asked to search online, indicate “No.”

10.2.3 Removing ViatorCheckBT

As part of uninstalling ViatorCheckBT, com0com will be removed by its uninstaller. Click **Next** to continue through the prompts and remove all components of com0com.

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10.3 Using ViatorCheckBT



To begin running ViatorCheckBT, select **Start → Programs → VIATOR files for MACTek → Utilities → VIATORCheckBT**.

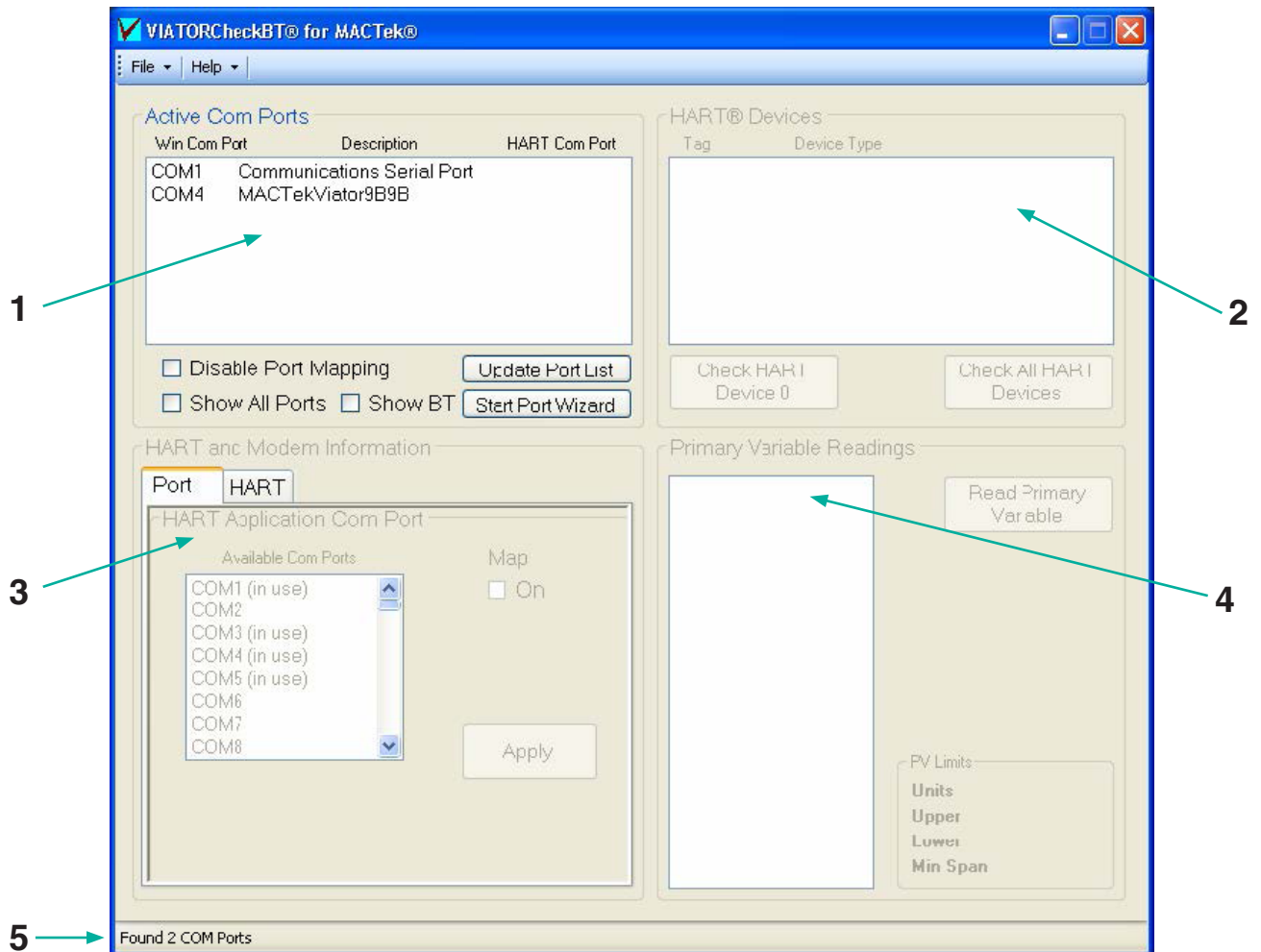


Note!

If your Viator Bluetooth Interface is not connecting, try powering off the Viator interface and powering it back on. See chapter 7 for instructions on establishing communication.

The ViatorCheckBT application is divided into 5 sections, shown in the below screenshot:

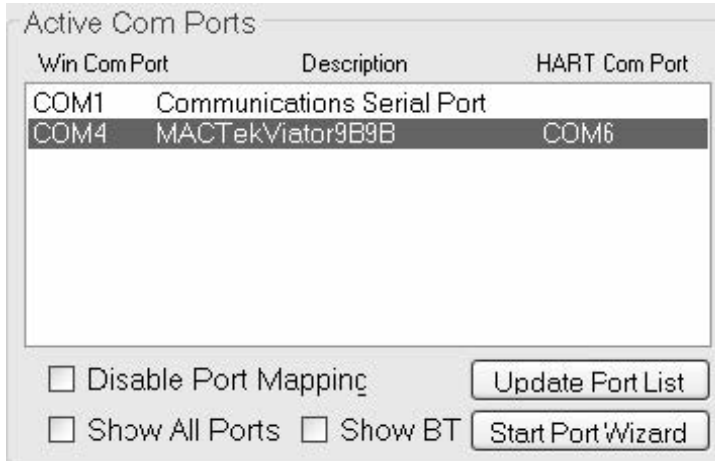
1. Active COM Ports List
2. HART Devices List
3. HART, Port Mapping, and BT Modem Information
4. Primary Variable Readings
5. Viator Status Message Line\



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10.3.1 Active COM Ports List

The Active COM ports list displays all of the active COM ports on the system, along with some descriptive information about what type of COM port it is (such as USB or Bluetooth) and the HART COM port it is set to. For Bluetooth COM ports, the Bluetooth device name will also be displayed if it can be determined. The default list shows only COM1-4, Viator USB modems, and all Viator Bluetooth modems.

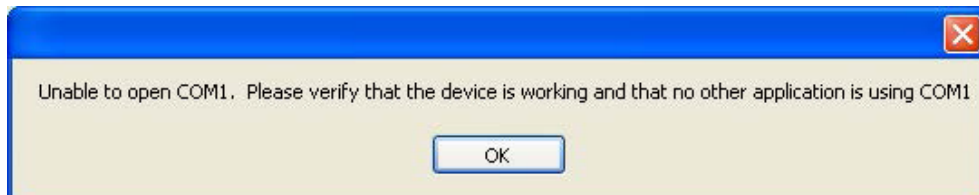


10.3.1.1 Update Port List

The options **Show All Ports** and **Show BT** allow display of all ports with or without BT ports. Setting **Show All Ports** will automatically select **Show BT** ports and un-checking **Show BT** with **Show All Ports** checked will only show the serial and USB ports. Pressing **Update Port List** will scan for any new modems and will update the list based on the port selection checked.

10.3.1.2 Selecting a Port

Clicking on a COM port will select it, and it will attempt to open. If a previous COM port was already opened by ViatorCheckBT, that one will now be closed. If the COM port cannot be opened, an error message is displayed:



Once a COM port is selected and opened, the "HART Device List" and the "HART and Modem Information" areas become available.

10.3.1.3 HART COM Port



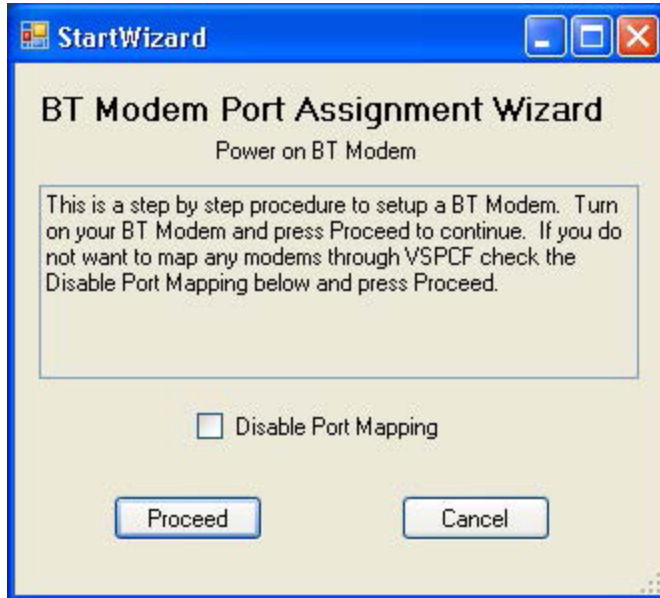
Upon starting, ViatorCheckBT will scan for Viator Bluetooth modems. If any are detected, it will map the actual modem port to an available HART COM port. Use the HART COM port when specifying the port to a HART application. If the port mapping is not required, then select **Disable Port Mapping** before exiting the program to inhibit the Viator Serial Port Communication Filter (VSPCF) program from starting and mapping the ports. The Viator Bluetooth modem ports should be mapped to allow better performance. This is critical for some HART applications to work with the Bluetooth modem.

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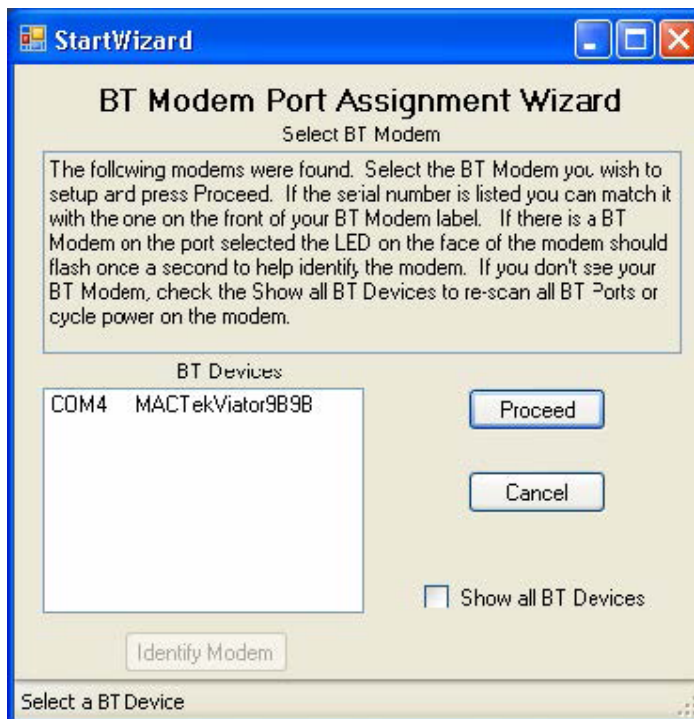
10.3.1.4 Port Wizard



The Port Wizard is a step-by-step procedure for creating a mapped port. Click on **Start Port Wizard** below **Update Port List** to go through a series of windows that will explain the steps and set up the mapping. The first screen shown below allows the mapping to be disabled completely. To continue with the wizard, click **Proceed**.

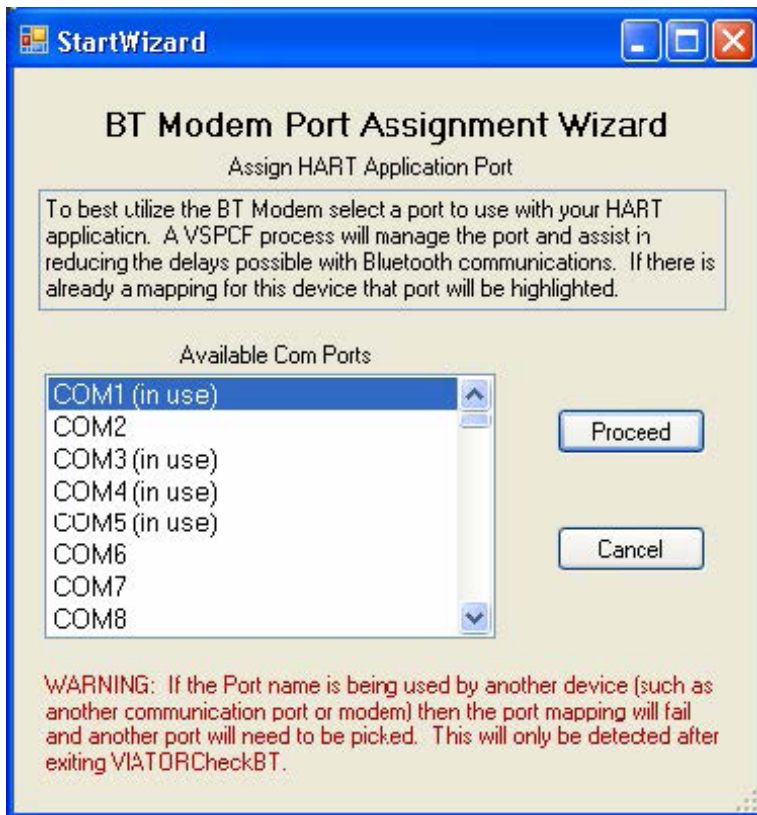


The next screen allows the selection of the Bluetooth modem to set up. If the BT modem does not appear in the list, check **Show all BT Devices** to re-scan. The modem may also need to have the power cycled in order to appear. After selecting the modem port, the **Identify Modem** button can be used if the modem is not easily detected among other modems. A long steady blink every second will help identify the modem selected.

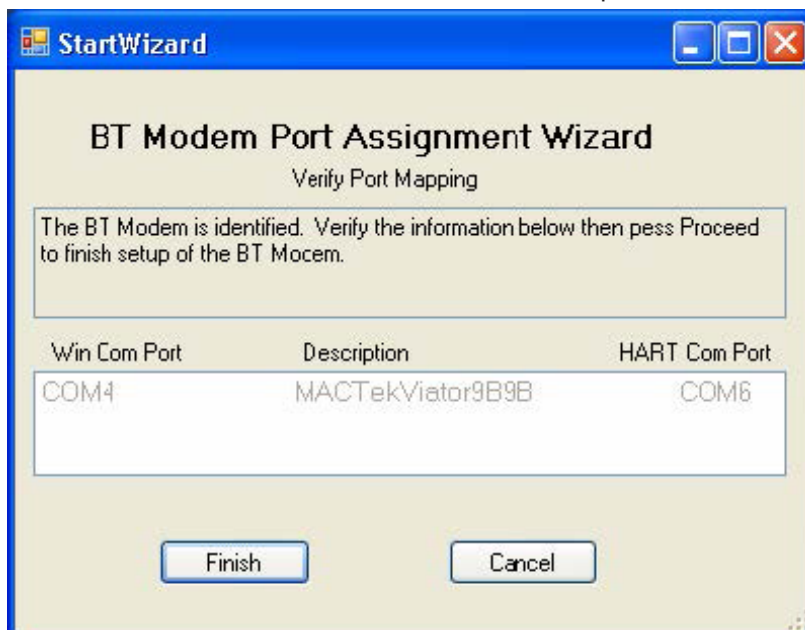


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After the HART Bluetooth modem has been selected, the next step is to select a port to map the modem to. This will be the actual port that a HART application will use to communicate through the modem. Select a port that your application can recognize. If the port is shown as “(in use),” do not choose it unless you are absolutely sure that you do not have any device on that port. If another BT modem or piece of equipment has reserved that port, it will not be possible to enable mapping for it.



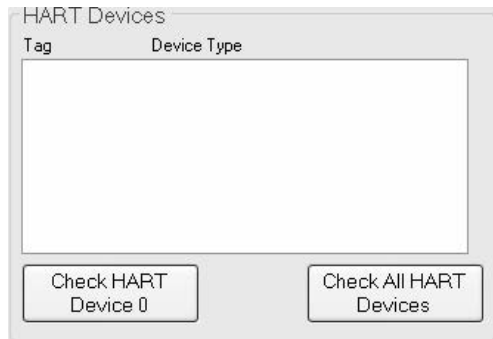
The final screen allows the mapping selections to be confirmed. The actual mapping will not occur until ViatorCheckBT is closed and VSPCF is run on that port.



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10.3.2 HART Devices List

The HART device list displays all of the detected HART devices after a check has been performed. There are two types of checks that can be performed: **Check HART Device 0** and **Check All HART Devices**.



- **Check HART Device 0** checks for and displays a HART device existing on polling address 0 only.
- **Check All HART Devices** checks for and displays all HART devices existing on polling addresses 0 to 15.

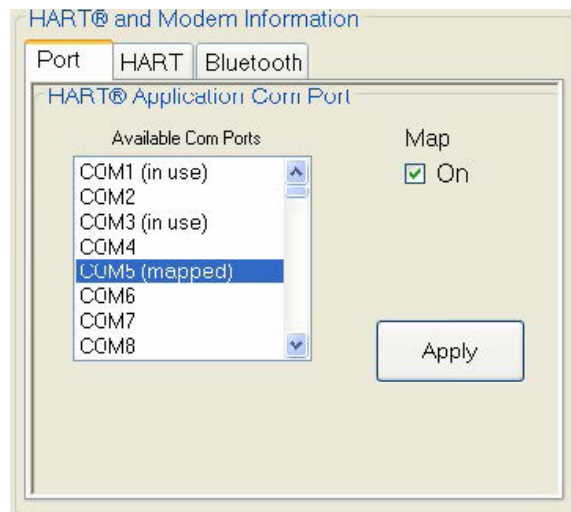
When the check is complete, the first entry in the list will be selected and additional HART information will be retrieved from that device and displayed in the HART and modem information area.

If more than one device is detected, the active device can be selected by clicking on the entry in the list. When a new device is selected, additional HART information will be retrieved from that device and displayed in the HART and modem information area. After a HART device is checked, the HART Information tab displays information about the active device, such as the manufacturer ID, device ID, and the tag name.

10.3.3 HART Device/Modem Information

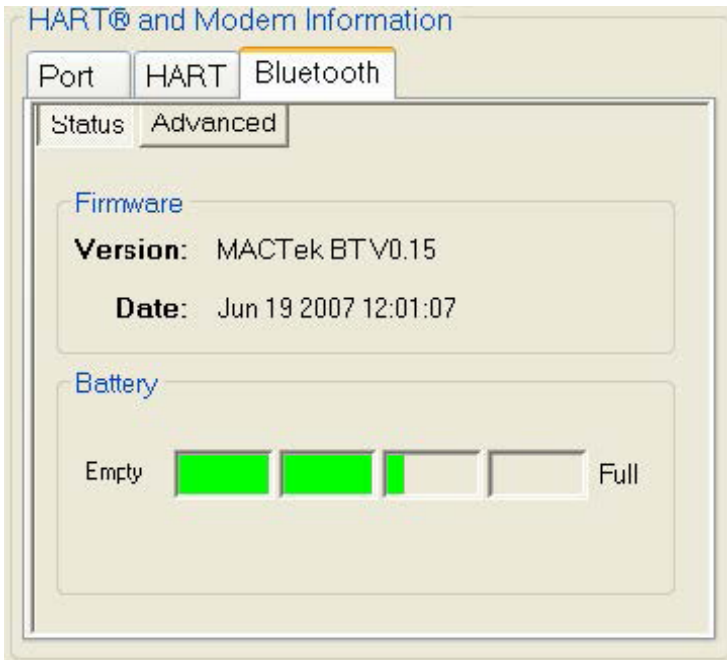
The HART and Bluetooth information area tabs display additional information about the active HART device. The tab for Bluetooth information will only be shown if a Viator Bluetooth modem is selected.

The port information tab allows the port mapping to be enabled or disabled for the selected device and the selection of a port from the available COM Ports to be mapped for the HART application COM port. When enabled, the mapping is shown in "Active Com Ports." If a port is shown as "(in use)," this means that a device has been previously located at this port. If you believe that this is no longer true and want to re-use one of the lower ports for applications that may only be able to work with ports COM1-8, then double clicking on the port will switch its status to free. You can then assign a mapping to that port by selecting it and pressing **Apply**.



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When a Bluetooth modem is selected, the Bluetooth tab will show the basic settings screen for the Viator interface. This screen shows the current firmware revision and a battery gauge for the Viator interface.

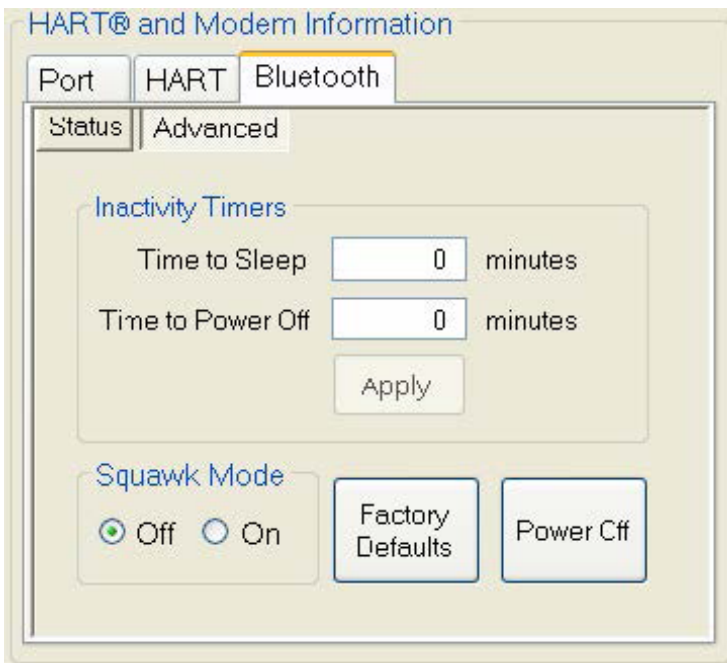


Clicking on the Advanced Button will bring up advanced settings that can be used with the Viator Bluetooth HART Modem.



Note!

Inactivity time is defined as the amount of time since the last HART message was received or transmitted.



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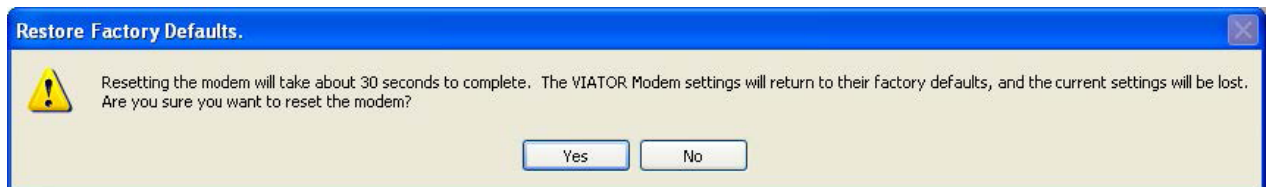
Time to Sleep: Amount of inactivity time (in minutes) after which the Viator interface will disconnect and enter a sleep mode (this helps to conserve battery life). When in sleep mode, connection can be re-established from the PC to the Viator interface. If this setting is set to 0, the feature is disabled. To change this setting, enter in the new value and click **Apply**.

Time to Power Off: Amount of inactivity time (in minutes) after which the Viator interface will completely power off. Once the Viator is powered off, the power button must be pushed to turn it back on. If this setting is set to zero, the feature is disabled. To change this setting, enter in the new value and click **Apply**.

Squawk Mode: Set to **On** to enable Squawk Mode; **Off** will disable Squawk Mode. Squawk Mode is a way to identify a Viator interface and, when enabled, it will display a unique LED blink pattern. This is useful when multiple Viator interfaces are being used.

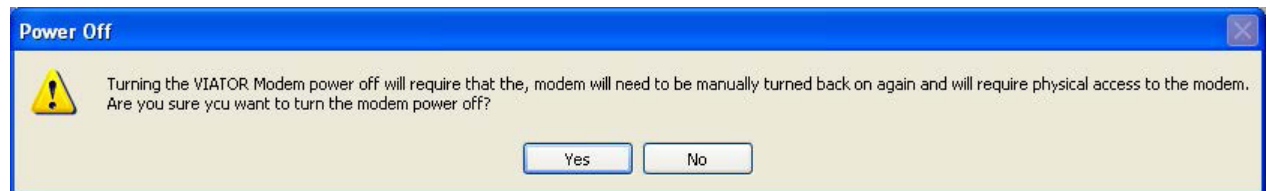
Factory Defaults: This button resets the Viator interface back to the factory default settings. Resetting to factory defaults will also initialize a number of settings with the Bluetooth connection and takes 20 to 30 seconds to complete. While in progress, the LED on the Viator interface will blink on and off slowly until complete. This will cause the COM port to close.

The following prompt will be displayed when this item is selected:



Power Off: Clicking this button will turn off the Viator interface and cause the COM port to close. Once the Viator is powered off, the power button must be pushed to turn it back on.

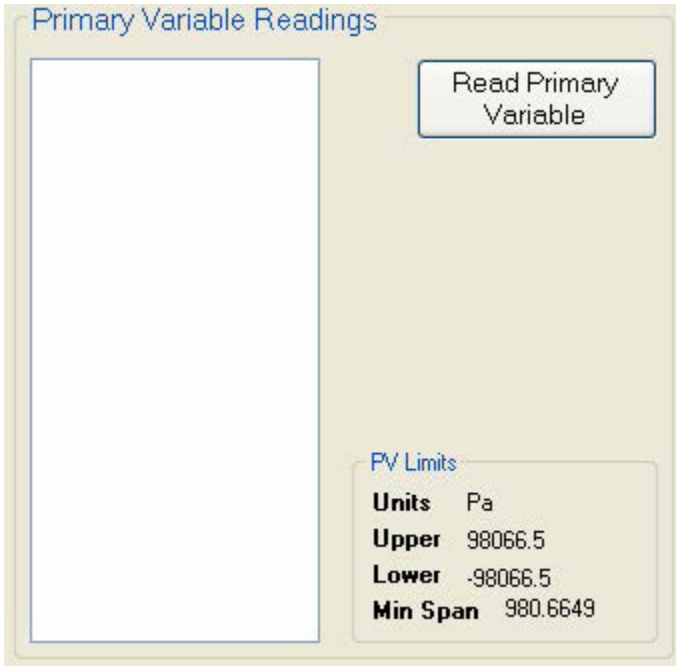
The following prompt will be displayed when this item is selected:



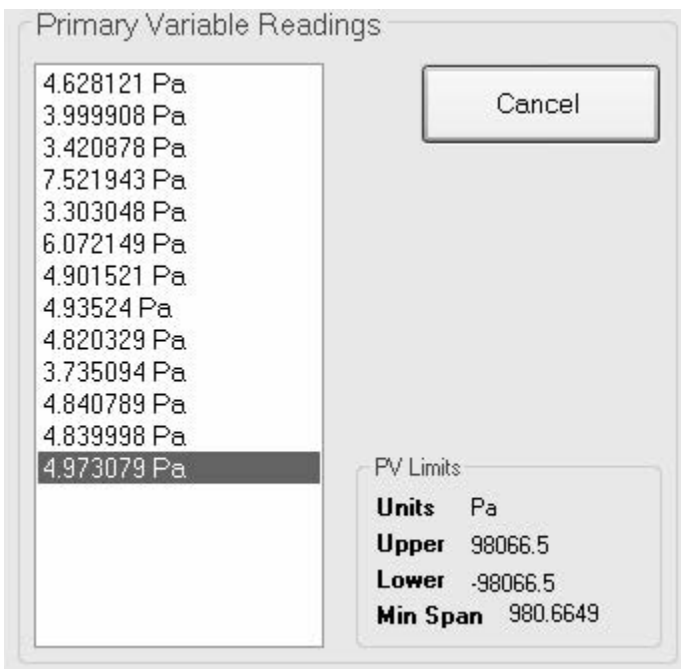
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10.3.4 HART Device Primary Variable Readings

After a HART device has been selected in the HART Device List, the primary variable for the active device can be read. In the lower right part of this area, the HART primary variable limits are displayed for the active device.



Read Primary Variable: Clicking this button will read the primary variable every 1 to 2 seconds from the active HART device and display it in the window. Once pressed, the button will change to say **Cancel**, which can be clicked to cancel the reading of the primary variable.



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10.3.5 Status Message Line

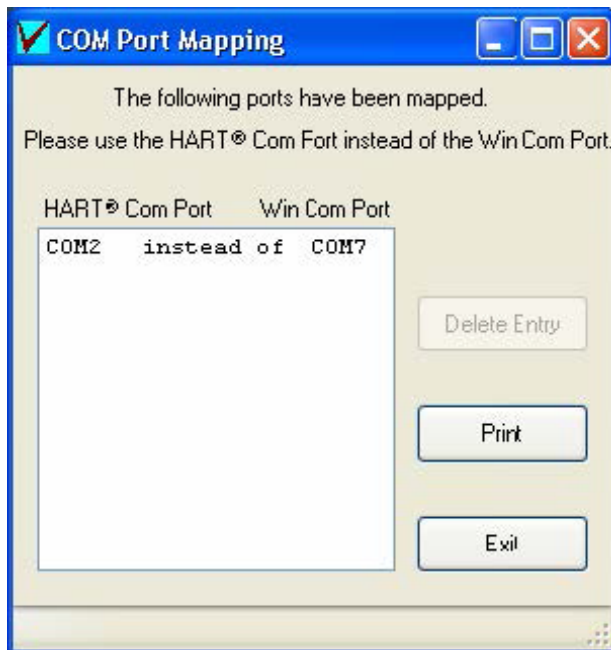
This line will display status information for the current operation, such as opening a COM port or reading the primary variable.



10.3.6 Exiting ViatorCheckBT

When exiting ViatorCheckBT, any ports shown as mapped in the active COM ports window will get mapped if **Disable Port Mapping** is not checked. This mapping will cause the program VSPCF to be started for each mapped port. When active, the VSPCF program will appear in the Sys Tray. Each time ViatorCheckBT is started, the mapping for these ports will be discontinued until after ViatorCheckBT is exited. Each individual port has the ability to be mapped or not, and all mappings can be disabled by selecting **Disable Port Mapping** in the active COM ports window.

If mapping is enabled, the COM port mapping window will be displayed. This shows which port a HART application should use (HART COM Port) and which modem it is associated with (Win Com Port). If there are other ports that may have been mapped previously that are no longer needed, they can be selected and deleted. If any ports conflict, it will be shown here and the conflicting port can be deleted. After clicking **Exit** on this screen, the ports will be set up and VSPCF will be run for each port in the list.



10.4 Viator Serial Port Communication Filter

10.4.1 Overview

The Viator Serial Port Communication Filter (VSPCF) is a diagnostic software utility that is used with the ViatorCheckBT Software Utility. It shows the communication port mapping for the HART communication port to the virtual PC communication port.

10.4. Installation

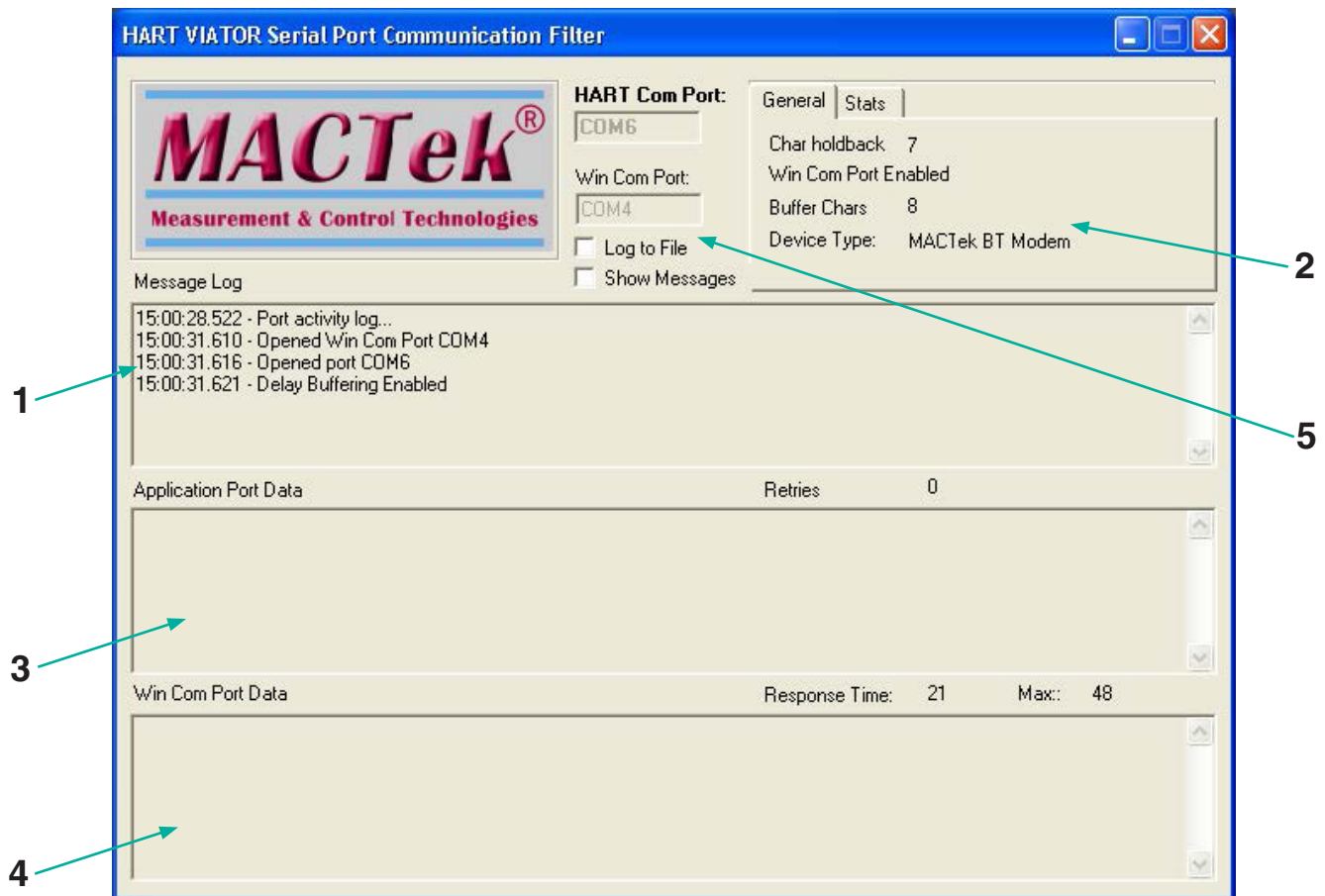
VSPCF is installed as a component to the ViatorCheckBT software utility. See chapter 10.2.

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10.4.3 Using VSPCF

VSPCF is started after ViatorCheckBT exits when a Windows COM port is mapped in ViatorCheckBT to a HART COM port. If **Disable Port Mapping** is checked, VSPCF will not be started when ViatorCheckBT exits. ViatorCheckBT will scan for Viator Bluetooth modems and, if detected, will map the actual modem port to an available HART COM port. Use **HART COM port** when specifying the port to a HART application. VSPCF will start after exiting ViatorCheckBT. VSPCF will restart after a reboot from the Startup folder.

When VSPCF is running, a VSPCF icon will be displayed in the lower-right PC system tray. Hovering the mouse over the VSPCF icon will show a quick status of the mapped port or application state. Right clicking the VSPCF icon will bring up the VSPCF menu. Double clicking the icon will bring up the following screen:



The VSPCF logging window is divided into 4 sections, as shown in the above screenshot.

1. Message Log
2. HART Data Information tabs
 - a. General – general device information
 - b. Stats – information on the number of packets and bytes on the port and a button to clear the statistics
3. Application Port Data log window
4. Windows COM Port Data log window
5. Port and Message Settings window

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10.4.4 Message Log

This section shows a log of system information about the application and communication ports and shows an abbreviated message log between the PC communication port and the HART communication port. Checking the **Log to File** checkbox will append a log to the utilities folder with all of the data traffic shown in the combined windows.

10.4.5 HART Data Information Tabs

The General tab displays the modem port status, the modem type, and some settings for the virtual ports.

The Stats tab displays information on the number of master packets, burst packets, and the number of bytes on the interface. The App packets and bytes are from data from an application sending through VSPCF. Modem, Burst, and Bytes are those generated on the HART bus as seen by the HART modem and may represent data from another master as well as the slave device. STX packets from either a primary or secondary master can come from an application using VSPCF or from monitoring another master on the HART bus. ACK primary and secondary packets are those seen on the HART bus. Clicking the **Clear Stats** button will clear all the information gathered in the tabs and on the screen. The message logs will not be cleared.

10.4.6 Application Port Data Log Window

Data from the application is represented here in a format that indicates the number of preambles by a '#' character, an STX/ACK (master/slave response), a HART Address, HART Command, and HART data section followed by the HART checksum. The number of retries is shown here, which reflects when the application sends the same message multiple times in sequence. This does not include "Command 0" messages which are routinely sent multiple times in sequence.

10.4.7 Windows COM Port Data Log Window

This section shows the communication data through the HART modem interface. The message is shown with a '#' indicating preambles followed by the long address if present (preceded by 'P', 'S', and 'B'), the message type (ACK/STX/BACK), the command (preceded by 'C'), the status (preceded by 'S'), the command data (preceded by 'D'), and the checksum.

```
13:50:38.288      #####(BACK)[ SB 37 DT 04 ID 1EF313 ][ C 01 ][ S 0040 ][ D 01 BC 26 B7 7B ]:1D
13:50:38.331      #####(STX)[ SB 37 DT 04 ID 1EF313 ][ C 6D ][ D 00 ]:63
13:50:38.684      #####(ACK)[ S 37 DT 04 ID 1EF313 ][ C 6D ][ S 0040 ][ D 00 ]:65
```

The Response Time field is the time in milliseconds that the slave took to start a response from the end of the last master message. The Max time is the longest response time detected.

10.4.8 Port and Message Settings Window

The Modem port and Mapped ports are listed in this section and a checkbox to **Log to File** can be set to save the data to a file. The file on the PC is called HARTComLog.txt and is located in the same folder where the application resides (normally C:\Program Files\MACTek VIATOR Utility\Utilities). When VSPCF is started, only the port information messages are shown and not any message information in the log windows. When **Show Messages** is enabled, the current messages will start to be displayed. It is recommended that this is not enabled for more than a 24 hour period, because it can slow down the performance of VSPCF. **Log to File** can be used in place of the screen messaging if data needs to be collected for extended periods of time.

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10.4.9 Viewing HART Data Activity

This is an example of HART data activity as viewed with the VSPCF logging window. An application sent two commands to the slave device shown in the application port data section. The responses from the slave are shown in the Win COM port data section. Information on the size and timing of the messages is shown in the message log section as well as under the Time tab.

General	Stats	
Packets(Total)	Packets(Burst)	Bytes (Total)
App: 59		826
Modem: 199	158	5362
Packets(Primary)	Packets(Secondary)	
STX: 45	0	
ACK: 41	0	

Message Log

- 16:32:48.710 - Received BURST 16 bytes from Slave to Secondary
- 16:32:48.733 - Received message 9 bytes from Primary Master
- 16:32:49.211 - Received response 19 bytes from Slave response took 62 ms
- 16:32:49.435 - Received BURST 16 bytes from Slave to Primary
- 16:32:49.760 - Received BURST 16 bytes from Slave to Secondary
- 16:32:49.795 - Received message 9 bytes from Primary Master

Application Port Data

Retries: 4

- 16:32:40.966 #####(STX)[P 37 DT 04 ID 1EF313][C 03];CC
- 16:32:42.283 #####(STX)[P 37 DT 04 ID 1EF313][C 03];CC
- 16:32:44.506 #####(STX)[P 37 DT 04 ID 1EF313][C 02];CD
- 16:32:46.477 #####(STX)[P 37 DT 04 ID 1EF313][C 03];CC
- 16:32:48.733 #####(STX)[P 37 DT 04 ID 1EF313][C 02];CD
- 16:32:49.794 #####(STX)[P 37 DT 04 ID 1EF313][C 03];CC

Win Com Port Data

Response Time: 62 Max.: 998

- 16:32:47.709 #####(BACK)[SB 37 DT 04 ID 1EF313][C 01][S 0040][D 01 BC 80 9B F5];19
- 16:32:48.359 #####(BACK)[PB 37 DT 04 ID 1EF313][C 01][S 0040][D 01 BC C5 14 96];30
- 16:32:48.709 #####(BACK)[SB 37 DT 04 ID 1EF313][C 01][S 0040][D 01 BC 64 4E 4A];97
- 16:32:49.210 #####(ACK)[PB 37 DT 04 ID 1EF313][C 02][S 0040][D 40 7F FB BA BA D5 FF 0E];23
- 16:32:49.434 #####(BACK)[PB 37 DT 04 ID 1EF313][C 01][S 0040][D 01 BC 1C CD D2];74
- 16:32:49.759 #####(BACK)[SB 37 DT 04 ID 1EF313][C 01][S 0040][D 01 BC 77 EC 60];0C

10.4.10 HART Communication Log

If the **Log to File** checkbox is checked in the VSPCF window, the HART data will be logged to a file located in the directory where the application is installed (normally C:\Program Files\VIATOR files for MACTek\Utilities). The data from all three logging sections are presented with a > shown for received data from the modem and a < shown for transmitted data to the modem by the application.

```
09:57:48.507 - Received valid packet 5 bytes from Primary Master
>09:57:49.101 - #####(ACK)[ P 00 ][ C 00 ][ S 0040 ][ D FE EF EF 08 06 01 03 10 01 01 00 01 05 04 03 20 ];19
09:57:49.101 - Received valid packet 23 bytes from Slave to Primary
<09:57:49.204 - #####(STX)[ P 2F DT EF ID 010001 ][ C 08 ];CA
09:57:49.205 - Received valid packet 9 bytes from Primary Master
>09:57:49.580 - #####(ACK)[ P 2F DT EF ID 010001 ][ C 08 ][ S 4040 ][ D ];CC
09:57:49.581 - Received valid packet 11 bytes from Slave to Primary
```

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10.4.11 VSPCF Menu

Clicking the right mouse button over the VSPCF icon in the lower-right system tray will bring up the following menu:



10.4.12 Run at Startup

By default, **Run at Startup** is checked and will allow VSPCF to start each time the PC is rebooted and, if necessary, logged in. Uncheck **Run at Startup** to manually control when VSPCF will be run.

10.4.13 Delay Buffering

The **Delay Buffering** option should always be checked and allows the Bluetooth modem to function properly regardless of delays associated with Bluetooth communications.

10.4.14 Closing VSPCF

Click on **Close** to shut down the VSPCF application and restore access to the real Bluetooth modem port. When the VSPCF window is open, closing the window does not shutdown VSPCF. You must use the **Close** menu item to shut down VSPCF.

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- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
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- Industrial HMI
- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
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