VCI10-BH

BLUETOOTH® HART® COMMUNICATION INTERFACE

VIVACE™
Process Instruments

HART®
COMMUNICATION FOUNDATION

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NOTE

We have reviewed this manual with great care to maintain compliance with the hardware and software versions described herein. However, due to the dynamic development and version upgrades, the possibility of technical deviations cannot be ruled out. We cannot accept any responsibility for the full compliance of this material.

Vivace reserves the right to, without notice, make modifications and improvements of any kind in its products without incurring in any circumstances, the obligation to make those same modifications to products sold previously.

The information in this manual is frequently updated. Therefore, when using a new product, please check the latest version of the manual on the Internet through our website www.vivaceinstruments.com, where it can be downloaded.

You customer is very important for us. We will always be grateful for any suggestions for improvements as well as new ideas, which can be sent to the e-mail: contato@vivaceinstruments.com preferably with the title "Suggestions".

SUMMARY

WARNING

It is extremely important that all the safety instructions, installation and operation in this manual are followed faithfully. The manufacturer is not liable for damage or malfunction caused by improper use of this equipment.

It is recommended to strictly following the rules and good practice relating to installation, ensuring correct grounding, noise insulation and good quality cables and connections in order to provide the best performance and durability to the equipment.

Special attention must be considered in relation to installations in hazardous areas, where applicable.

SAFETY PROCEDURES

- Appoint only skilled people, trained with process and equipment;
- Install equipment only in operation compatible areas, with the proper connections and protections;
- Use proper safety equipment for any handling device in field;
- Turn area power off before equipment installation.

SYMBOLOGY

Caution - indicates risk or error source

Important Information

General or Specific Risk

Electric Shock Danger

GENERAL INFORMATION

Vivace Process Instruments ensures the operation of this equipment, according to the descriptions contained in its manual, as well as technical characteristics, not guaranteeing its full performance in particular applications.

The operator of this equipment is responsible for observing all aspects of safety and prevention of accidents applicable during the execution of the tasks in this manual.

Failures that might occur in the system, causing damage to property or injury to persons, shall additionally be prevented by external means to a safe outlet for the system.

This equipment must be used only for the purposes and methods proposed in this manual.

1   EQUIPMENT DESCRIPTION

Vivace **VCI10-BH** communication interface provides connection of any HART® device based on the standard FSK frequency modulation (frequency-shift keying) with *Android™* devices, such as smartphones and tablets, or Windows®-based tools, via Bluetooth® communication.

The interface works with version 5, 6 or 7 of HART® protocol, using VMT-HART app to configure, monitor and calibrate HART® devices in real time. VMT-HART uses information described on device DDL file (*Device Description Language*) in order to show the content of each screen. For more details about VMT-HART, check the app manual.

For Windows® plattform, VCI10-BH works with FDT/DTM and HART® tools that use serial communication port.

This manual provides detailed instructions about interface hardware and how it works with VMT-HART app or FDT/DTM tools.

For any doubts not contained on this manual, please contact *Vivace Process Instruments* website www.vivaceinstruments.com.br.

2 PRODUCT CONTENT

Check if all the following items are contained on product package:

- VCI10-BH Interface;
- USB to micro-USB Cable;
- USB Charger;
- 2 batteries.

3 CONNECTION

VCI10-BH is a "HART modem" and its main function is to interface *smartphones/tablets* or *Windows*® tools with the HART® network through Bluetooth® communication, allowing data exchange between those parts according to HART® protocol.

Interface compact size and low energy consumption make VCI10-BH an ideal solution for HART® protocol. Its robustness makes the interface adapted to any plant or process, with easy handle for user.

VCI10-BH is connected to *smartphones/tablets/personal computers* devices through a Bluetooth® connection and to HART® network via two clip probes, as shown on Figure 3.1.

Figure 3.1 –VCI10-BH connection.

The interface physical connection is resumed to only one step:

- Connect the clip probes to the HART® network (as show on the figure above).

VCI10-BH allows user to power the HART® device, whatever it is powered by voltage or current (transmitters or valve positioners, respectively). This option must not be enabled when device is connected to HART/4-20mA bus (only for bench work or disconnected from bus). Check "Pwr" switch: when it is positioned to "On", interface will provide power to device according to "Out" switch ("V" for transmitters or "mA" for valve positioners). When "Pwr" switch is positioned to "Off", device must be powered by the HART/4-20mA bus.

The interface also offers a 250 Ohm internal load to assist the communication between transmitters and the HART® modem contained on the interface. Check the available options on the topic **Label,** on this manual.

> ⚠ **Attention!** This equipment is not certified for classified areas!

4 BATTERY

Interface VCI10-BH needs batteries (provided by Vivace) to be powered and to power the device it will be connected to. In order to power the interface, change "Battery" switch to "On". Check "Pwr" and "Out" switches before connect the interface, according to table 5.1.

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Before using the interface for the first time, execute a full charge. After charge is complete, the interface will work for about 4 hours.

In order to charge batteries, user must connect *"USB to micro-USB cable"*. Connect the cable to the VCI10-BH (micro-USB) and to the USB port of PC or charger supplied with the interface. Check if LED *"Charging"* on VCI10-BH blinks during charging process.
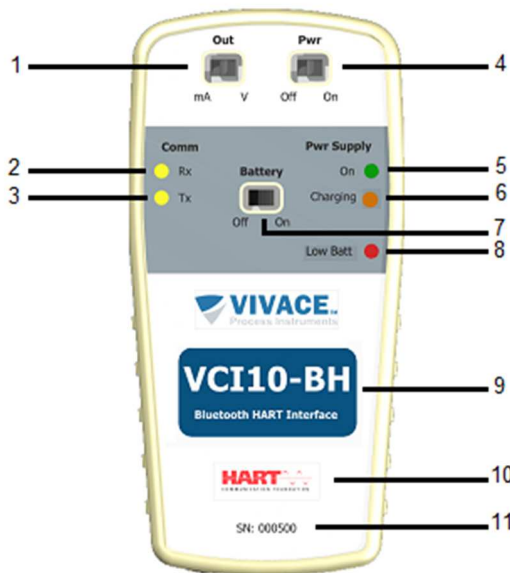
Battery Specification: Rechargeable Li-ion 3.7 V / 700 mAh a 3800 mAh.

> ⊙   **Battery warranty period: 60 days from the date of the invoice issue.**

5   LABEL

VCI10-BH has an identification label fixed on its frontal side. See on table 5.1 the specification of each label item.

Figure 5.1 –VCI10-BH label.

LABEL DESCRIPTION	
1	Selects power mode: current (mA) or voltage (V)
2	Reception of HART message
3	Transmission of HART message
4	Voltage/Current power enabled (ON) or disabled (OFF)
5	Interface circuit powered by batteries
6	Batteries being charged (LED blinking)
7	Battery on or off
8	Low battery voltage (LED on)
9	Interface model
10	Communication protocol
11	Interface serial number

Table 5.1 – VCI10-BH label description.

6 TECHNICAL SPECIFICATION

The main technical and physical characteristics of VCI10-BH are listed on Table 6.1. Those are important references which must be analysed before the interface use.

TECHNICAL DATA	
Power Supply	Through batteries
Output signal	24 Vdc or 3.9 mA
Storage Humidity	0% to 95% relative humidity
Operation Temperature	0 °C to 50 °C
Storage Temperature	-40 °C to 85 °C
Isolation	1500 Vac**
HART bus connection	Polarized clip probes
Dimensions	135 x 66 x 25 (mm)
Battery	Li-Ion 3.7V 700 mAh 16340
Battery charger	5 V 500 mA Min

Table 6.1 – Technical data of VCI10-BH.

** 1500 Vac between field device and Android^{TM} device, when not powered by interface

⚠ **Attention!** This equipment is not certified for classified areas!
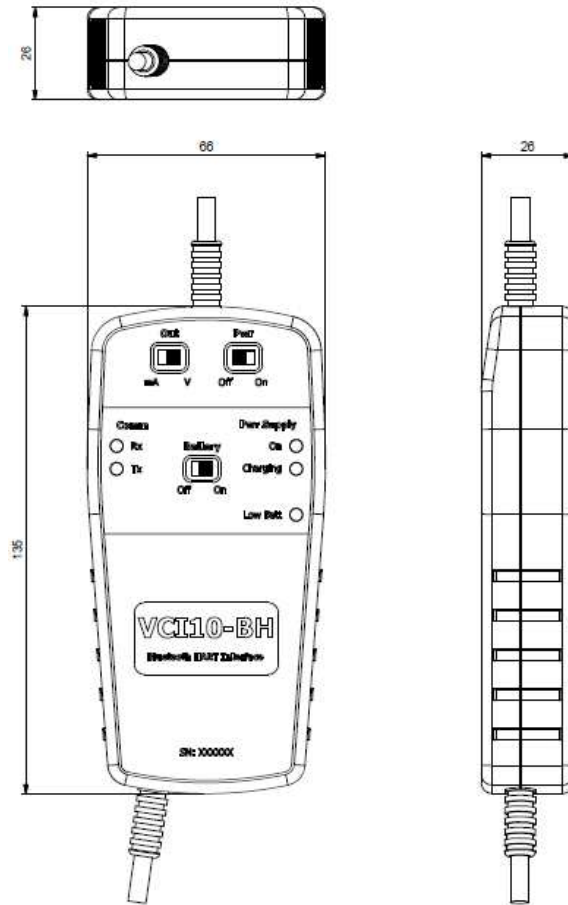
7 HOUSING DIMENSIONS

Figure 7.1 –VCI10-BH dimensions.

8   FDT/DTM TOOLS

> ⚠ **Attention!** DTM files are distributed by device manufacturers. Vivace only provides DTM files for Vivace equipments

VCI10-BH works with any HART® tool on Windows® plattform that uses serial communication port, being used with several FDT/DTM tools.

The main steps to configure and communicate to VCI10-BH on Windows® are described below. Before initializing the procedure, check if the computer is enabled with Bluetooth device. If not, user must install a Bluetooth adapter.

The first step is to find the Bluetooth connection for VCI10-BH and execute pairing. Enter **Control Panel** on Windows® and open the option **Devices and Printers**. Right-button the screen and select *Add devices and printers*.
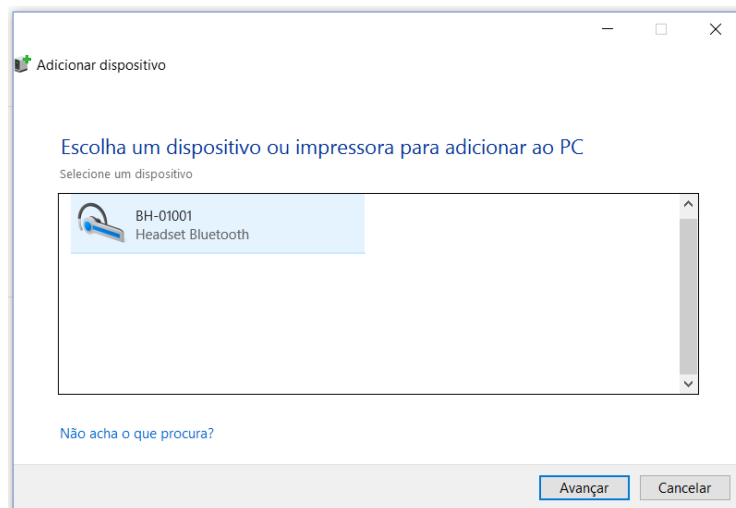

Figure 8.1 – Adding a new Bluetooth device.

The Bluetooth identification for VCI10-BH is composed by "BH-" + Interface Code. This code is located on the back side of the batteries cover.

After interface is found on device list, select it and click to proceed. A random key will be shown on screen.
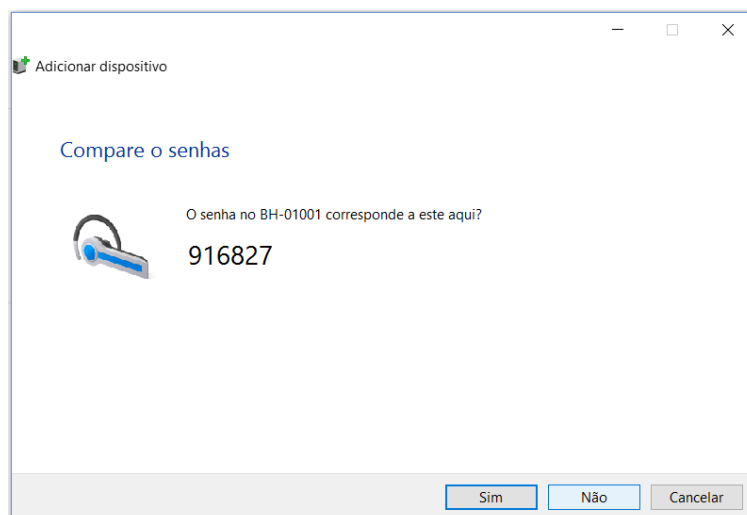

Figure 8.2 – VCI10-BH pairing key.

Click **Yes**. After this step, the interface will be paired and will appear on device list.
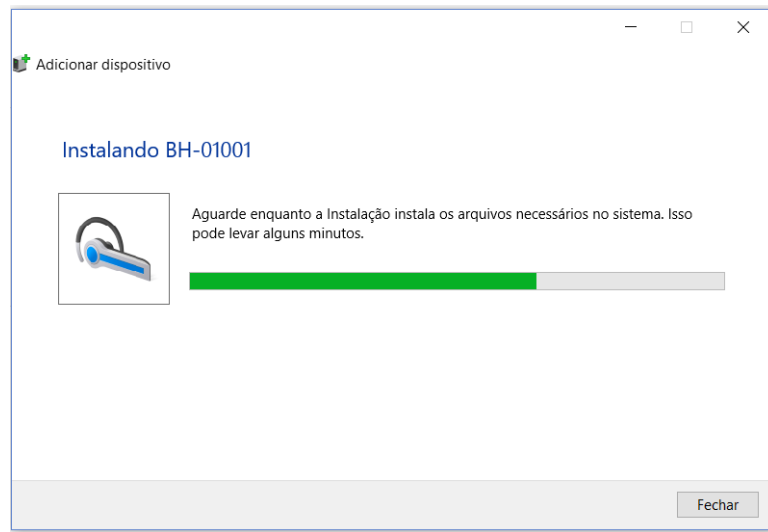

Figure 8.3 – Pairing VCI10-BH.

Figure 8.4 – Installed devices.

A serial port was created during the pairing process. In order to check the serial port number, right-click the paired device and select **Properties**. Click on "Hardware" tab. The serial port number appears on **Standard serial over Bluetooth link**. This number must be used on FDT/DTM tool or any other tool that uses serial communication.
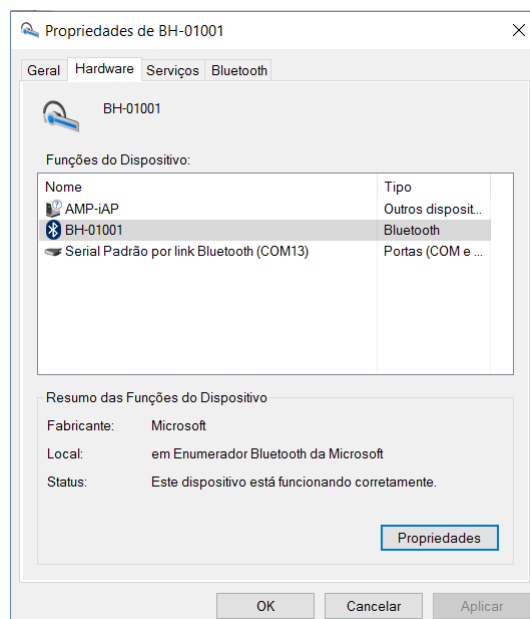

Figure 8.5 –Serial port for Bluetooth.

Once the interface is paired, this procedure will not be necessary again.

The figure below demonstrates serial port configuration for communication DTM on a FDT/DTM tool. After that, DTM will be ready to communicate with VCI10-BH. Check if the interface is powered and configured correctly.
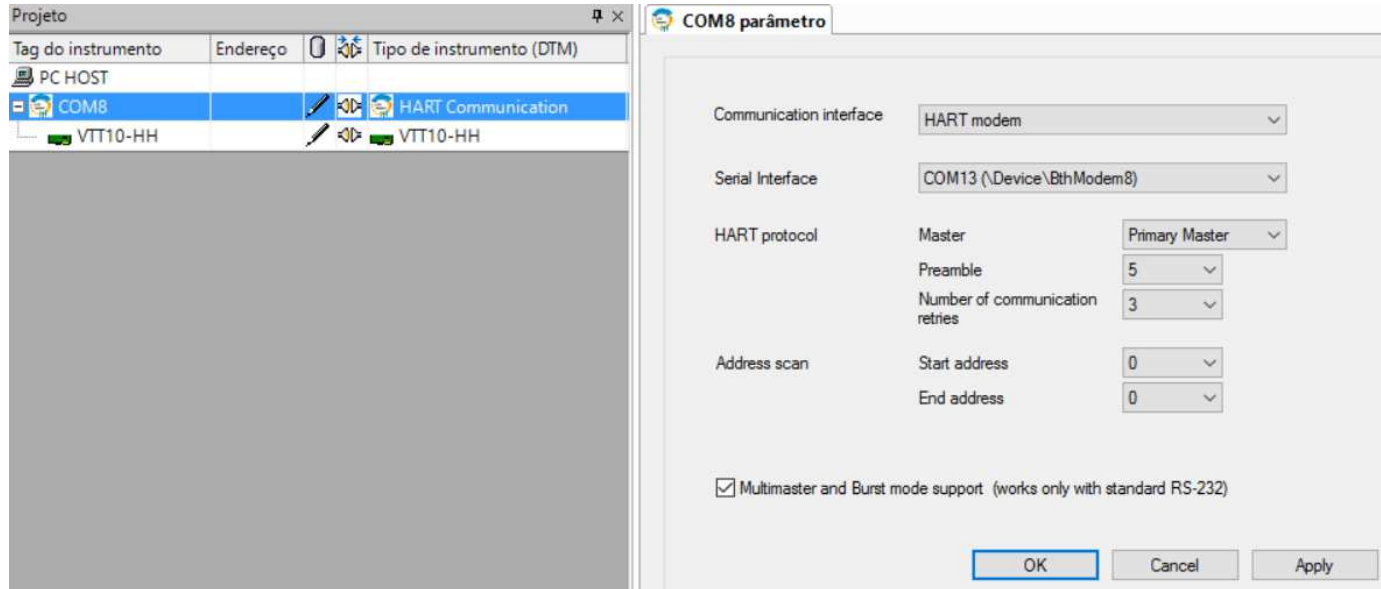

Figure 8.6 – Serial port configuration on FDT/DTM tool.

9   VMT-HART

VMT-HART (*Vivace Mobile Tool HART*) is a versatile configurator for HART® devices on *Android*™ plattform which integrates *Vivace Process Instruments* application family.

Working with VCI10-BH interface, it provides a complete solution for accessing and managing HART® field devices. It allows configuration, calibration, maintenance and monitoring variables from nay HART® device.

VMT-HART uses information described on device DDL file (*Device Description Language*) to determine the content to be shown on each screen, which variables can be edited, which procedures must be followed for execute calibration, setup or maintenance.

Before using VMT-HART it is necessary to pair VCI10-BH interface on the A*ndroid*™ device. Enter the Bluetooth configuration screen on A*ndroid*™, activate Bluetooth function and, after finding VCI10-BH, click on it to start pairing. A random key will be generated. The Bluetooth identification for VCI10-BH is composed by "BH-" + Interface Code. This code is located on the back side of batteries cover. Once the interface is paired, this procedure will not be necessary again.

On VMT-HART, check if the configured interface is the VCI10-BH (Bluetooth) and enter the interface code. "Interface" option will be found on pop-up menu of VMT-HART initial screen.
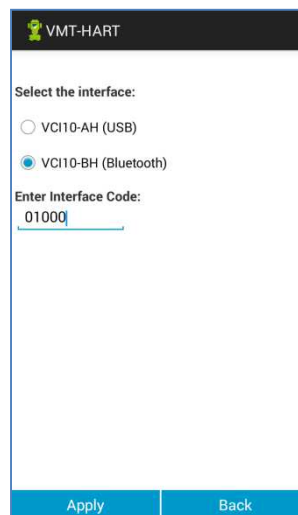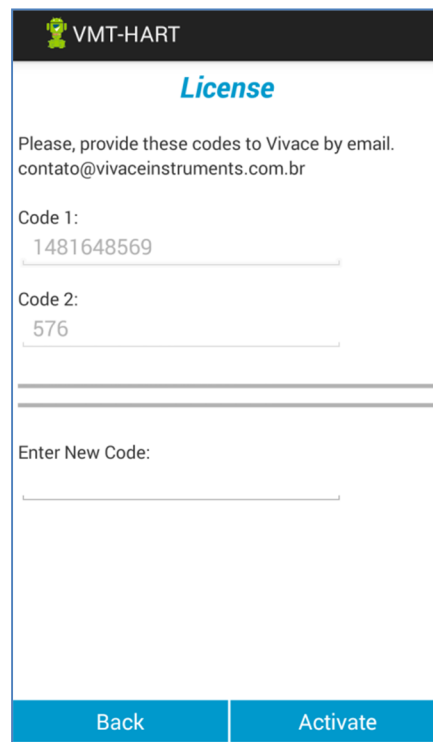

Figure 9.1 – VMT-HART: communication interface.

After that, it will be necessary to activate VMT-HART license. Enter option "License" on *pop-up* menu of VMT-HART initial screen (Figure 6.1) and send   to *Vivace Process Instruments* via e-mail (contact@vivaceinstruments.com.br) "Code 1" and "Code 2" in order to receive the register key.

Figure 9.2 – License.

After receiving the register key, access license screen, type the key on "Enter New Code" field and click on the button "Activate".

VMT-HART will be ready to communicate with VCI10-BH after this registration. Check if the interface is powered and configured correctly.

For more details about VMT-HART app, please consult application manual, available for download on www.vivaceinstruments.com.br.

10 ORDERING CODE

VCI10 *Communication Interface*

Communication Type	U	USB
	A	ANDROID
	B	BLUETOOTH

| Communication Protocol | H | HART |
| | P | PROFIBUS |

Configuration Accessory	0	NO ACCESSORY
	1	REGULAR TABLET
	2	INDUSTRIAL TABLET

Ordering Code Example:

| VCI10 | - B | H - 0 |

11 WARRANTY

11.1.   GENERAL CONDITIONS

Vivace ensures its equipments from any defect on manufacturing or component quality. Problems caused by misuse, improper installation or exposure to extreme conditions are not covered by this warranty.

The user can repair some equipments by replacing spare parts, but it is strongly recommended to forward it to *Vivace* for diagnosis and maintenance in cases of doubt or impossibility of correction by the user.

For details about the product warranty, see the general term warranty on Vivace website: www.vivaceinstruments.com.br.

11.2.   WARRANTY PERIOD

Vivace ensures the ideal operating conditions of their equipment by a period of two years, with full customer support regarding to installation, operation and maintenance for the best use of the equipment.

It is important to note that even after warranty period expires, *Vivace* assistance team is ready to assist customer with the best support service, offering the best solutions for the installed system.

APPENDIX

VIVACE Process Instruments	**FSAT** **Technical Analysis Solicitation Form**	
Company:	**Unit/Department:**	**Shipping Invoice nº:**
Standard Warranty: ( )Yes ( )No	**Extended Warranty: ( )Yes ( )No**	**Buying Invoice nº:**

COMMERCIAL CONTACT	
Complete Name:	**Position:**
Phone and Extension:	**Fax:**
e-mail:	

TECHNICAL CONTACT	
Complete Name:	**Position:**
Phone and Extension:	**Fax:**
e-mail:	

EQUIPMENT DATA	
Model:	**Serial Num.:**

PROCESS INFORMATION			
Environment Temperature (ºC)		**Work Temperature (ºC)**	
Min:	**Max:**	**Min:**	**Max:**
Operation Time:		**Fail Date:**	

FAIL DESCRIPTION: Here user should describe in detail the observed behaviour of product, frequency of fail occurence and repeatability. Also, should inform operational system version and a quick description of control system architecture where the equipment was installed.

ADDITIONAL OBSERVATION: