viBlueRIO®

User Manual

(Revision 1.6 - April, 2006)

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Introduction

Thank you for purchasing the viBlueRIO™ wireless carrier National Instruments CompactRIO™. The carrier features the breakthrough Bluetooth™ wireless technology that lets you create efficient communications between your laptop or desktop PC or PDA and National Instruments cRIO™ measurement devices using Bluetooth™ wireless technology—without physical connectors or cables.
Before you install and start using your new viBlueRIO™ carrier, please take a few minutes to review some of the terms that you will be seeing throughout the document.

PC System Requirements

- PC compatible computer, CPU speed of 200MHz or above
- Memory: 256MB or above, 512MB recommended
- Microsoft Windows XP Service Pack 2 installed
- MS Bluetooth stack compatible Bluetooth interface

Package contents

- viBlueRIO carrier
- Battery
- Antenna
- USB cable
- Software driver for NI LabVIEW 7.1 and above
- MS Windows USB driver for configuration and software update
- User Manual

General Overview

viBlueRIO™ is based on viBlue® autonomous wireless interface for National Instruments cRIO modules. viBlueRIO™ provides Class 1 Bluetooth® interface from NI cRIO™ modules to PDAs and PCs. Combined with application software for Microsoft PocketPC and MS Windows, viBlue® forms a complete wireless solution for truly portable measurements and data logging. viBlueRIO™ NI LabVIEW driver supports LabVIEW Real-Time and opens a door to the advanced world of NI LabVIEW based industrial and laboratory applications.

General Features

- Compact size and light weight
- Easy connectivity to PDAs and laptops
- Universally accepted Bluetooth® class 1 (100 meters) communication standard
- Firmware update via USB
- NI cRIO™ module autodetection
- Storing the configuration in the NV memory.
- Demo mode if no NI cRIO module found
- Testing and configuration via USB
- Up to seven simultaneous connections to various viBlue® modules
- Up to 8 hours of operation at full speed using plug-in rechargeable battery
- Power and battery charging via standard USB port

Bluetooth® Communication

viBlue® is based on Bluetooth® Class 1 technology. Depending of transmission conditions it provides up to 100m range bi-directional high-speed communication with Bluetooth equipped devices like PDAs, laptops or desktop PCs. When communicating with computer or PDA viBlueRIO™ acts as a slave. Up to seven slave BlueRIO devices can establish connection to one host simultaneously sharing overall data transmission bandwidth. After host (Bluetooth enabled computer or PDA) initiated connect request, viBlueRIO™ and the host establish communication using standard Bluetooth procedure. If communication is established successfully viBlueRIO™ blue LED is light on.

Power options and Batteries charging

viBlueRIO™ is battery-powered device. External USB cable might be used to powering the module as an option. The carrier has two rechargeable batteries operated in parallel: small built-in battery and a main one - connected at the bottom. Built-in battery can be used for approximately an hour of short runs, while both batteries allow up to 8 hours of continues carrier operation with NI cRIO™ 9233 module connected. Standard USB cable is used for battery charging. Up to 20 hours might be required fully charge both batteries in slow charging mode available through standard USB connection. To provide fast charging mode optional 5V DC power supply is needed.

National Instruments cRIO™ Modules Supported

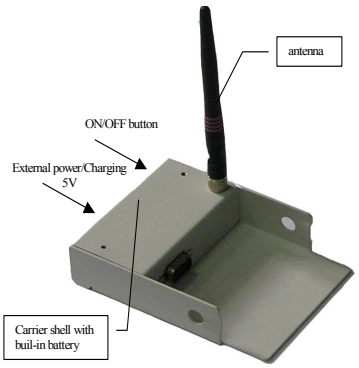
viBlueRIO™ 9233

The first in series of cRIO analogue input modules to be supported. An ideal choice for a variety of vibration applications in R&D and machines conditional monitoring.

- 24 bit NI cRIO™ 9233 NIST traceable precision
- 4 simultaneous sampling IEPE complaint sensor inputs
- 7 k samples per second aggregate continuous sampling rate with 24 bit precision
- 50k samples per channel maximum sampling rate
- Up to 6 seconds records length at maximum speed (one channel)

Visit www.vitec.ru for up to date list of supported NI cRIO™ modules.

viBlueRIO™ controls and indicators



Power ON/OFF Button

viBlueRIO™ carrier is modern microprocessor based one button device so it is very easy in operation. Just turn it on by pressing the power button with sharp object (PocketPC stylus or similar) at the back side to the left from two LEDs and power connector. Green Power LED lights on and switch to slowly blinking when viBlue is put into idle mode and ready for operation.

Power LED

Power LED is GREEN when power is turned ON and starts blinking slowly when the device is ready to use.

Power LED is blinking RED when charging is required. Blinking frequency shows battery level. Once per second (approx.) blinking indicates 50% level. The lower is battery charge, the faster LED blinks. With simultaneous green LED light ON it may appears like orange.
Power LED is solid RED while charging. When process of charging is complete – power LED switches to GREEN.

Communication LED

Communication LED (blue) is ON when connection is established.
Communication LED blinks when there is no connection or connection is broken.

viBlueRIO™ software

Bluetooth PC interfaces supported

viBlueRIO™ can be used with any Microsoft Windows Bluetooth stack compatible devices (built-in or external) starting from Microsoft XP SP2. To find out which Bluetooth stack (driver) is installedon your PC please use Windows Device Manager and Properties/Driver tab of your Bluetooth hardware. Please visit www.microsoft.com to see updated list of Bluetooth interfaces supported by Microsoft stack.

National Instruments LabVIEW support

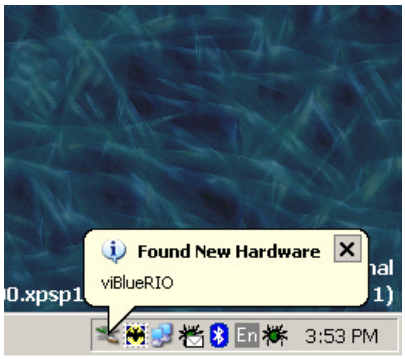
NI LabVIEW Software support for viBlueRIO™ consists of a set of VIs to configure, and to communicate with viBlueRIO™. A simple demo as a core for custom application is also provided. NI LabVIEW 7.1 and above are supported. To install LabVIEW support run setup application from LabVIEW support CD and follow on-screen instructions.

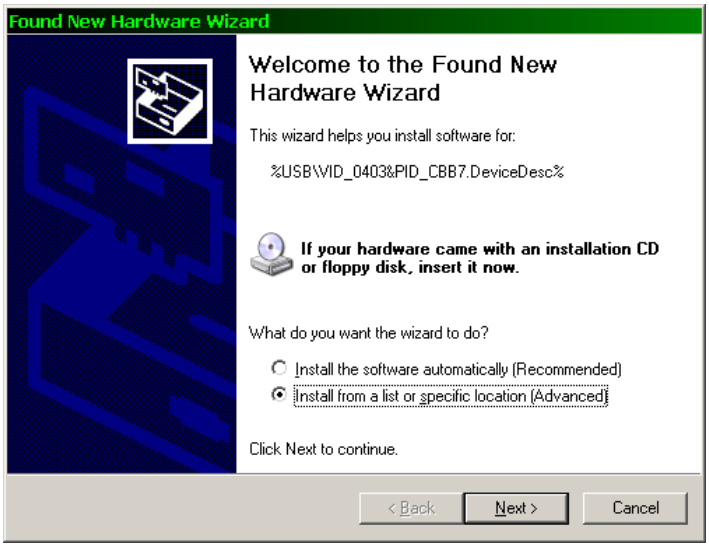
PDA support

VibroGraph software for data logging to PocketPC 2003 SE and later is supported. Please contact www.vitec.ru for other PDA based software for viBlueRIO™.

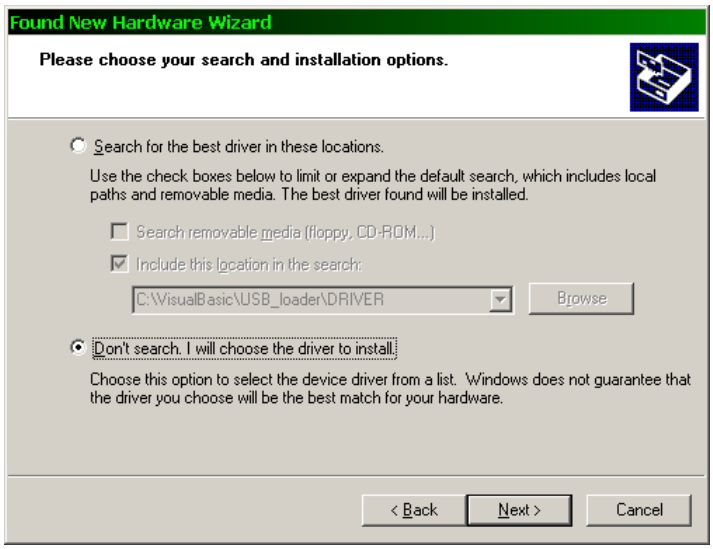
Windows USB Driver Install

Connect viBlue™ device to the computer's USB port. Windows should find the device and ask for a driver:

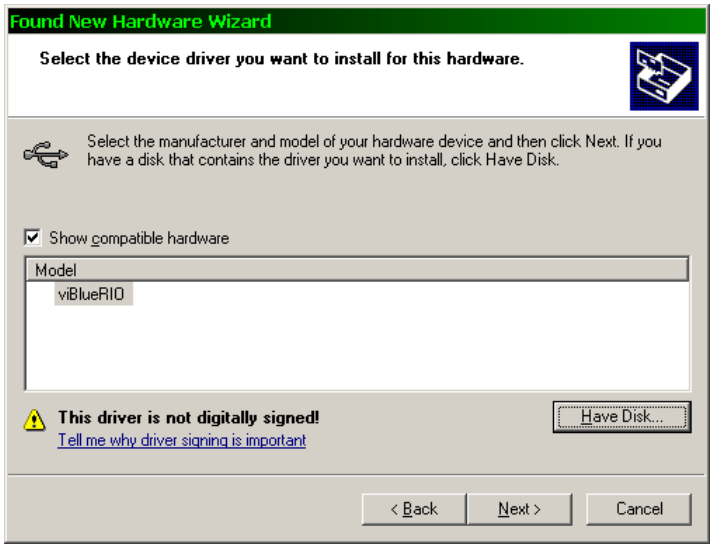




Select “Install from a list of specific location” and click “Next” button.
Windows should show the next screen:

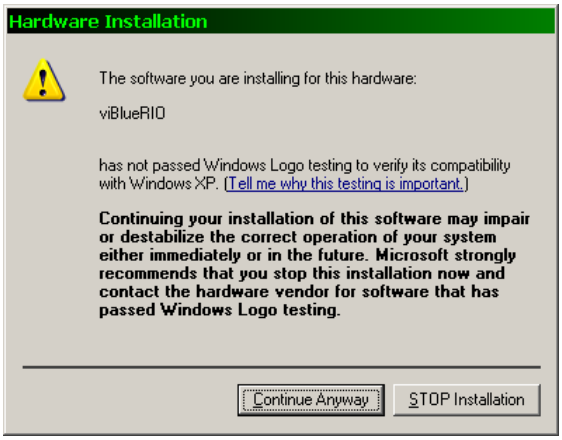


Select “Don’t search. I will choose the driver to install” and click the “Next” button.
Windows should show the list of compatible device(s):



Click “Have Disk” button and select the driver directory. Select “viBlue” from the list and click “Next”.

Windows warns you about untested driver. Click “Continue Anyway”



Finally you should get the message like this:


Found New Hardware
Your new hardware is installed and ready to use.
Windows XP Professional
328-1920 (Service Pack 1)
En
4:06 PM

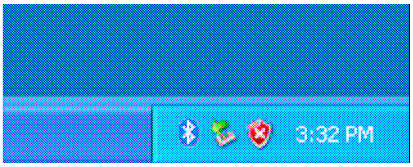
Pairing

What is "Pairing ?"
Pairing is a Bluetooth™ function that enables Bluetooth™ devices to remain permanently linked to another.

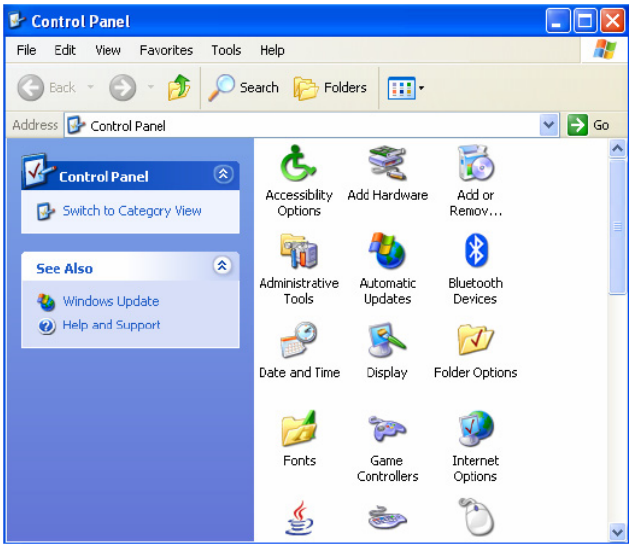
What "Pairing" means in terms of security?
As mentioned, Pairing allows devices to permanently link with each other. The pass key authentication will also be perpetuated in Pairing, meaning that devices will not ask for a pass key once they are paired. Paired devices will remain linked, even if other paired devices are turned off. Once a paired device turns back on, it is ready to be used and service requests will not ask for the pass key again. The built-in 128 bit security encryption of Bluetooth™ assures the privacy of your paired devices. Note: If devices are unpaired, it is necessary to enter a pass key each time a service request is made from or to another Bluetooth™ device.

Why do I need Pairing?
You will need to perform the Pairing procedure described below to automatically connect your viBlueRIO to PC each time they turn on.

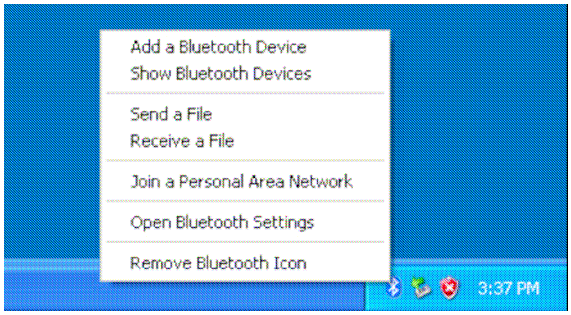
Pairing for MS Windows SP2 Bluetooth stack
When your Bluetooth interface hardware and Microsoft Bluetooth stack software (driver) are operating normally you will see a Bluetooth icon on your traybar that allows you to perform all Bluetooth operations, as shown below:



Optionally, you can find this in Control Panel >Bluetooth Devices.

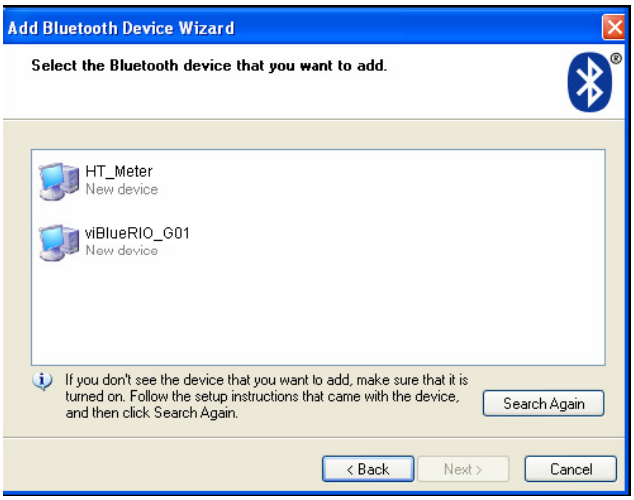


To connect with your Bluetooth device, simply right-click on the Bluetooth icon on the traybar and select *Add a Bluetooth Device*.

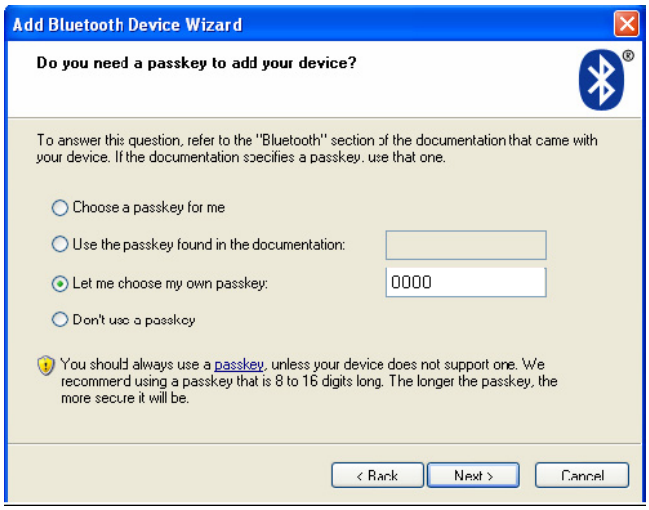


Make sure to set your viBlueRIO device is turned ON and check the box as shown on the picture below.

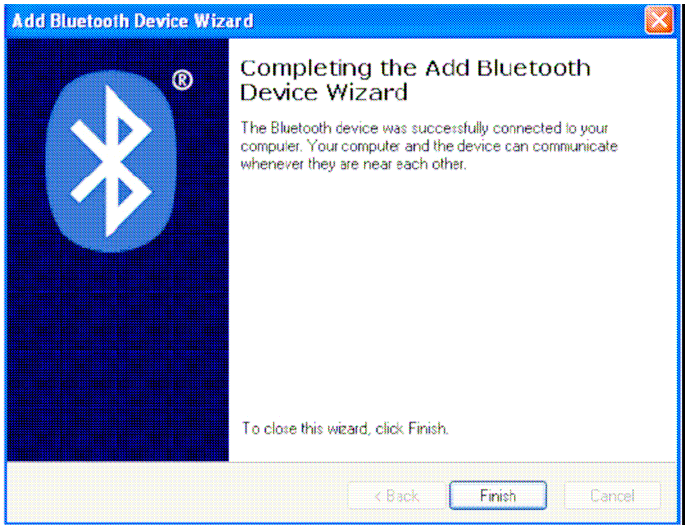
Your computer will search for all the Bluetooth devices in your area and list them in the window below. Select the desired device, and click Next.



Check *Let me choose my own passkey* box and enter "0000" as a passkey (see picture below). Press *Next* button to continue.



To complete pairing procedure simply press Finish button in panel shown below.



Specifications

Standard compliance	Bluetooth 1.2 Class I
Operating Frequency	2.4 to 2.4835 GHz
Output power	4-18 dBm, Class I
Spread Spectrum	FHSS (Frequency Hopping Spread Spectrum)
Modulation	GFSK (Gaussian Frequency Shift Keying)
Antenna Type	External SMA, 2.4 dBi maximum
Operating range*	100 m radius
LED indicators	Power ON/OFF, Connection status
Supply Voltage	2.4V DC build-in battery 5.0V DC via external USB connector for charging
Typical power consumption	100 mA maximum, 2.4V DC 20 mA in sleep mode, 2.4V DC
Dimensions, cm **	3.8 x 8.7 x 11.5
Weight **	300g
Operating Temperature	5 to + 55 degrees Celsius
Storage Temperature	-30 to +70 degrees Celsius
Humidity	10-95% noncondencing
Certification	FCC, CE
Warranty	1 year limited warranty

* Range is dependent upon environment, number of users, and other wireless devices within proximity.

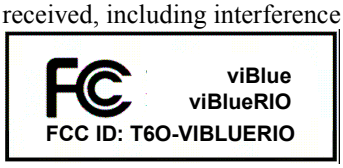
** With external battery connected. Without antenna and cRIO™ modules.

Specifications are subject to change without notice.

Important Information

Declaration of conformity with FCC rules for electromagnetic compatibility

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



For questions regarding your product or this FCC declaration, contact:

DigiMetrix Software LLC
San Diego, California
+1(858) 5381390

To identify this product, refer to the Part, Series, or Model number found on the product.

Caution: Exposure to Radio Frequency Radiation.

This product emits radio frequency energy, but the radiated output power of this device is far below the FCC radio frequency exposure limits and European Union Council Recommendation 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields. Nevertheless, the device should be used in such a manner that the potential for human contact with the antenna during normal operation is minimized. The system antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all the persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Modifications

Any changes or modifications made to this device that are not expressly approved by ViTec Co., Ltd. may void the user's authority to operate the equipment.

Class B digital devices regulatory notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These

limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by 1 or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio or television technician for help

Europe-European Union Notice

Hereby, Vitec Co., Ltd., declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

CE 0682 ⓘ

This equipment is intended for indoor use

List of countries within the EU or geographical zones where it can be used:

Austria	France	Slovakia
Czech Republic	Netherlands	Spain
Denmark	Portugal	Sweden
Finland	Germany	United Kingdom

The use of this equipment in other conditions or places of the ones specified in this user's manual may void the user's authority to operate the equipment.

Declaration of Conformity
1999/5/EC

We,

Vitec Co., Ltd.
170 Fontanka emb.
St. Petersburg, 198035
Russia

declare under our sole responsibility that the product:

Type of equipment: **Wireless NI cRIO™ carrier**
Brand name: **viBlue**
Model name: **viBlueRIO**

to which this declaration relates, is in compliance with all the applicable essential requirements, and other provisions of the European Council Directive:

1999/5/EC	Radio and Telecommunications Terminal Equipment Directive (R&TTE)

The conformity assessment procedure used for this declaration is Annex IV of this Directive.

This product will bear CE Mark label as follows: CE 0682 ⓘ

Product compliance has been demonstrated on the basis of:

- EN 60950-1: 2001 - Council Recommendation 1999/519/EC	For article 3.1 (a): Health and Safety of the User
- EN 301 489-1 V1.5.1 - EN 301 489-17 V1.2.1	For article 3.1 (b): Electromagnetic Compatibility
- EN 300 328 V1.6.1	For article 3.2 : Effective use of spectrum allocated

The technical construction file is kept available at:

Vitec Co., Ltd.
170 Fontanka emb.
St. Petersburg, 198035
Russia

Authorised Signature by

Maxim K. Soroka
Director

Date: April 20th, 2006

Company stamp: Общество с ограниченной ответственностью "Витэк" "ViTec" Co.Ltd. Санкт-Петербург

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