

Rhein Tech Laboratories, Inc.  
360 Herndon Parkway  
Suite 1400  
Herndon, VA 20170  
<http://www.rheintech.com>

Client: TMI-USA, Inc.  
Model #: ZIGBEEBASE1  
Standards: FCC 15.247/IC RSS-210  
ID's: RMK-RECZIGB1/10839A-RECZIGB1  
Report #: 2013024

**Appendix K: Manual**

Please refer to the following pages.



### TMI-ORION

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

# USER'S GUIDE

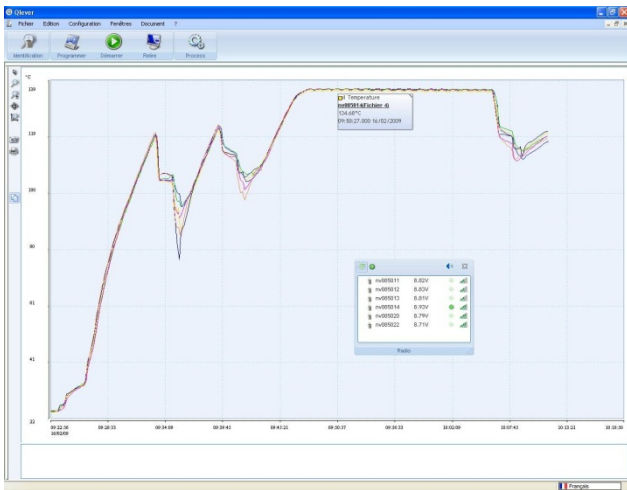
## Radio NanoVACQ 2.4GHz

[NVQ-2.4GHz]



- Main specifications :
- dimensions : D.31 x H.45 mm
  - volume : 34cc
  - weight : 120 g
  - memory : 48 000 acquisitions ÷ number of channels

## Quality control



## Radio Data logger





**TMI-ORION**

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

**USER'S GUIDE**  
**Radio NanoVACQ 2.4GHz**  
[NVQ-2.4GHz]



Main specifications :

- dimensions :  
D.31 x H.45 mm
- volume : 34cc
- weight : 120 g
- memory : 48 000 acquisitions  
÷ number of channels

*Table of contents*

1.	<i>General description of the Radio NanoVacq 2.4 GHz</i>	3
2.	<i>Precautions of use</i>	4
3.	<i>Disconnecting device</i>	4
4.	<i>Electrical Safety Data Sheet</i>	5
5.	<i>NanoVACQ Radio 2.4 GHz</i>	5
6.	<i>Radio Receiver 2.4 GHz - ZigBeeBase</i>	5
7.	<i>Detailed description of the Radio NanoVACQ 2.4 GHz</i>	6
8.	<i>General</i>	6
9.	<i>Mechanical resistance</i>	6
10.	<i>Antenna</i>	7
11.	<i>Caution about the NanoVACQ temperature</i>	7
12.	<i>Use the Radio Receiver 2.4 GHz</i>	8
13.	<i>USB port connexion</i>	8
14.	<i>Long distance communication via RS485</i>	9
15.	<i>Communication by Ethernet port</i>	9

All the pictures shown in this guide are not contractual.



## TMI-ORION

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

# USER'S GUIDE

## Radio NanoVACQ 2.4GHz

[NVQ-2.4GHz]



### Main specifications :

- dimensions :  
D.31 x H.45 mm
- volume : 34cc
- weight : 120 g
- memory : 48 000 acquisitions  
÷ number of channels

## 1. General description of the Radio NanoVacq 2.4 GHz

The Radio NanoVACQ 2.4 GHz is a wireless data logger equipped with one or multiple sensors. The design features the following: the ability to transmit data, thanks to the radio communication, (temperature, pressure, humidity,..) in real time and beside the ability to record data inside the memory.

The used frequency band is located in the 2.4 GHz (industrial equipment) ISM band (scientific or medical).

The Radio NanoVACQ 2.4 GHz is designed to be exposed to temperatures ranging from -80 to +150°C and is fully waterproof to immersion; it may be exposed to some pressure up to 15 bars. The logger body is made of 316L stainless steel.

The Radio NanoVACQ 2.4 GHz body is 31 mm diameter. Its height may vary from 45 to 135 mm according to the temperature range and the battery pack used.

The Radio NanoVACQ 2.4 GHz antenna, that can be unplugged from the base, is 50 mm long and is insulated. It allows wireless data transmission.

The User would use the Software Qlever to set the parameters of the NanoVACQ 2.4GHz.

When programming, the user would select the desired operating mode:

- Transmitting data without recording inside the memory,
- Recording data without transmitting,
- Both transmitting data by radio & recording inside the memory.

The Radio NanoVACQ 2.4 GHz is wireless because it has its own battery pack specially designed for this purpose and easily replaceable (only batteries provided by TMI-Orion can be used).





### TMI-ORION

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

## USER'S GUIDE

### Radio NanoVACQ 2.4GHz

[NVQ-2.4GHz]



#### Main specifications :

- dimensions :  
D.31 x H.45 mm
- volume : 34cc
- weight : 120 g
- memory : 48 000 acquisitions  
÷ number of channels

#### **The Radio NanoVACQ 2.4 GHz system generally includes:**

- The Radio NanoVACQ 2.4 GHz with a new battery pack and its transmitting antenna,
- An interface for PC communication,
- A radio receiver and its antenna,
- An operating software,
- An opening wrench,
- The NanoVACQ calibration file,
- A calibration certificate,
- A transport case (optional).

#### **RS485 option :**

- RS232 to RS485 converter cable with RJ11 card,
- 110V/220V adapter for radio receiver (RS485 or Ethernet only).

## 2. Precautions of use

The Radio NanoVACQ 2.4 GHz and the Radio Receiver 2.4 GHz are specific materials that should be used in a restricted access area only, with users who have carefully read every precautions of use written in the manuals.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## 3. Disconnecting device

When the 2.4 GHz radio receiver is powered through USB, in order to cut its power supply, disconnect the USB cable from the receiver side or from the PC side.



**TMI-ORION**

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

**USER'S GUIDE**  
**Radio NanoVACQ 2.4GHz**  
[NVQ-2.4GHz]



- Main specifications :
- dimensions : D.31 x H.45 mm
  - volume : 34cc
  - weight : 120 g
  - memory : 48 000 acquisitions ÷ number of channels

It is therefore necessary to leave a full and easy access to both the receiver and/or PC.

When the 2.4 GHz radio receiver is powered by the external power supply; in order to cut its power, disconnect the jack from the radio receiver. In this case the receiver loses its power.

To turn off the power block area there must unplug from the sector.

It is therefore necessary to leave a full and easy access to both the receiver and the power supply.

**4. Electrical Safety Data Sheet**

**5. NanoVACQ Radio 2.4 GHz**



TMI-ORION

Type: NanoVACQ Radio  
Ref.: NanoVACQ 2.4 GHz



**6. Radio Receiver 2.4 GHz - ZigBeeBase**



TMI-ORION

Type: Receiver 2.4 GHz  
Ref.: ZigBeeBase



Powered by USB:  +5V 400mA

Powered by external power supply:  +9V/+12V 400mA





## TMI-ORION

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

# USER'S GUIDE

## Radio NanoVACQ 2.4GHz

[NVQ-2.4GHz]



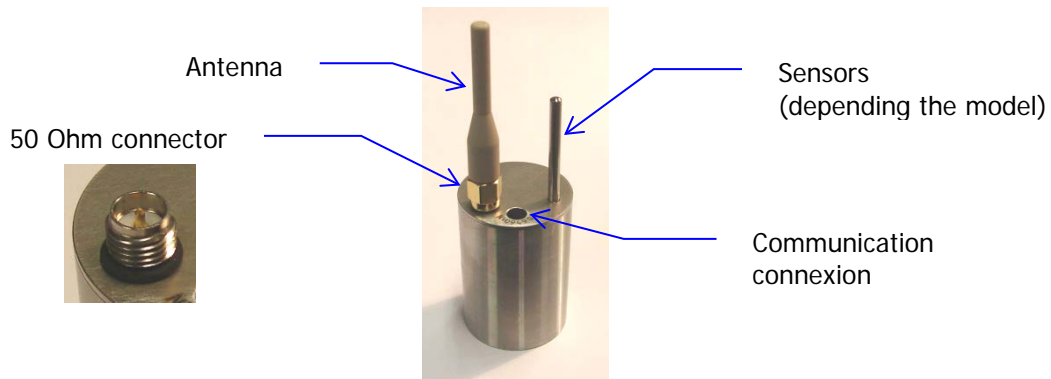
### Main specifications :

- dimensions :  
D.31 x H.45 mm
- volume : 34cc
- weight : 120 g
- memory : 48 000 acquisitions  
÷ number of channels

## 7. Detailed description of the Radio NanoVACQ 2.4 GHz

### 8. General

Radio NanoVACQ base is equipped with connectors and sensors:



- **Communication connexion:** connects to the PC through the interface provided by TMI-Orion; it is also used to place the opening wrench.
- **50 Ohm connector:** It connects to the antenna transmitter. Do not bend or damage the male contact located inside. The antenna must be removed when battery change or transport.

### 9. Mechanical resistance

The Radio NanoVACQ is designed to easily resist to mechanical stress commonly encountered in industry (rotation, vibration).

However excessive stress (fall or damage) are likely to modify the measurement performance and sometimes to break the radio NanoVACQ.

The radio NanoVACQ includes an antenna that can be unplugged. When it is screwed it should not be twisted or exposed to excessive shocks. In case of damage please contact TMI-Orion After Sales department. The antenna must be removed only when changing batteries or during transport.



## TMI-ORION

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

# USER'S GUIDE

## Radio NanoVACQ 2.4GHz

[NVQ-2.4GHz]

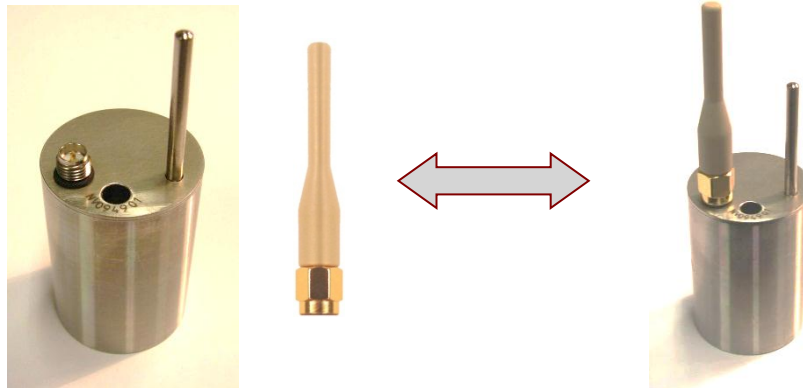


### Main specifications :

- dimensions :  
D.31 x H.45 mm
- volume : 34cc
- weight : 120 g
- memory : 48 000 acquisitions  
÷ number of channels

## 10. Antenna

In case it is necessary to screw or unscrew the antenna, only use the bottom end of the antenna in order to turn it, no tools are required, screw the antenna by hand to crush the seal, if a key is used the torque must be low.



## 11. Caution about the NanoVACQ temperature

The NanoVACQ can be positioned in an environment with a temperature above 70°C; to avoid any risk of burning, it must be handled with care and use with special gloves.

In case a bad handling damaging the device, contact TMI-Orion after-sale department (00.33/(0)4.99.52.67.15).





**TMI-ORION**

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

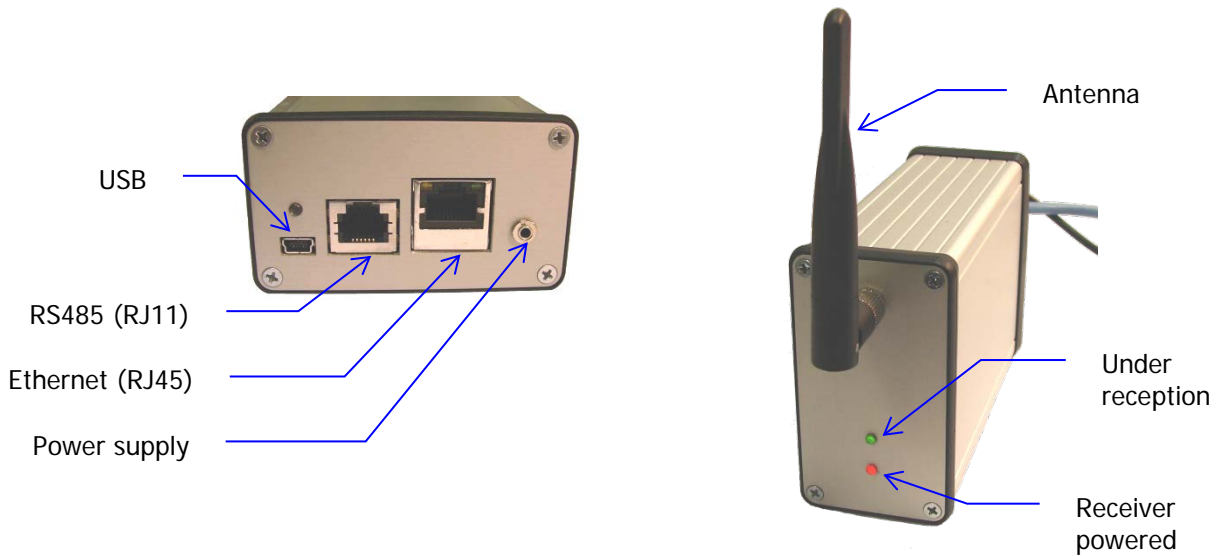
**USER'S GUIDE**  
**Radio NanoVACQ 2.4GHz**  
[NVQ-2.4GHz]



- Main specifications :
- dimensions : D.31 x H.45 mm
  - volume : 34cc
  - weight : 120 g
  - memory : 48 000 acquisitions ÷ number of channels

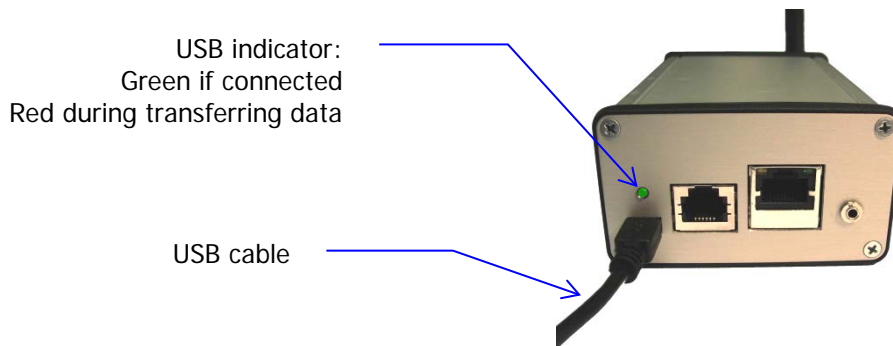
**12. Use the Radio Receiver 2.4 GHz**

The radio receiver (receiver base) can be connected either directly via USB or using a long-distance connection type RS485 or using an Ethernet connection. This wide range input/output allows our system to integrate more or less complex configurations.



**13. USB port connexion**

In order to use the Radio receiver via USB, only the USB cable is required. The receiver is powered by the USB port. The communication between the receiver and the PC is also possible thanks to this cable.



The maximum length for a USB connection is limited to 5 meters.



**TMI-ORION**

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

**USER'S GUIDE**  
**Radio NanoVACQ 2.4GHz**  
[NVQ-2.4GHz]



- Main specifications :
- dimensions : D.31 x H.45 mm
  - volume : 34cc
  - weight : 120 g
  - memory : 48 000 acquisitions  
÷ number of channels

During the first installation on the computer it is necessary to associate drivers. To do so use *TMI USB Installer*, to install the USB drivers on your computer.

When the installation is complete, a virtual serial port is created. This port must be used by the software to receive the data by radio.

**14. Long distance communication via RS485**

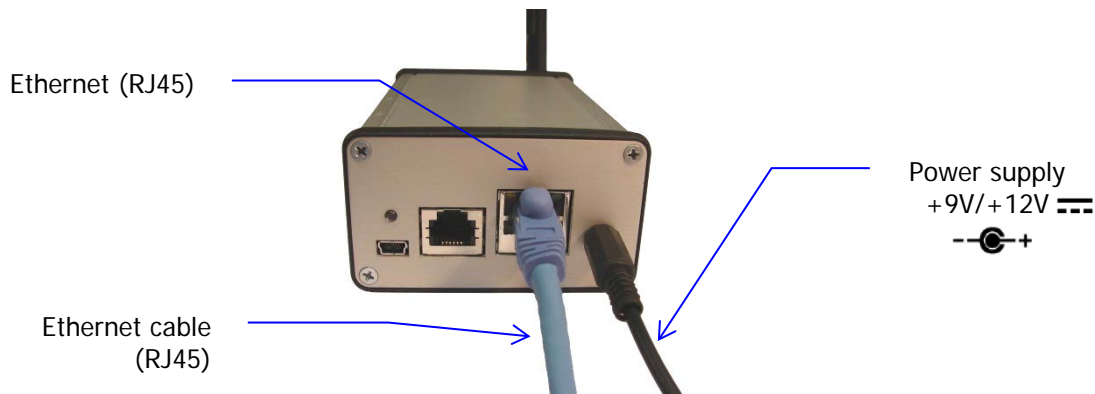
To use the radio receiver over a long distance RS485 link it is necessary to supply it with a power box. Then use the RS485 cable and the RS485 converter.

This way it is possible to move the receiver a hundred meters away from the computer.



**15. Communication by Ethernet port**

To use the receiver Radio via an Ethernet link it is necessary to use the supplied power box. And then use a RJ45 network cable to link either directly on the computer or on the local network.





### TMI-ORION

Parc de Bellegarde, Bât. C  
1, chemin de Borie  
F-34170 CASTELNAU LE LEZ

Tél. : + (33) 4.99.52.67.10  
Fax : + (33) 4.99.52.67.19

## USER'S GUIDE

### Radio NanoVACQ 2.4GHz

[NVQ-2.4GHz]



#### Main specifications :

- dimensions :  
D.31 x H.45 mm
- volume : 34cc
- weight : 120 g
- memory : 48 000 acquisitions  
÷ number of channels

Once connected to your local network (DHCP or fixe IP) or to your computer, a supplied Ethernet utility can detect the radio receiver and assign a virtual serial port. This port should be used by the software to receive the data by radio.