

User Manual

Node: 4-Channel Vibrating Wire Node

Model: Version 1.0

Manual Revision: 1.0



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1 Introduction

1.1 Warning

This guide intends to assist in the preferred mounting, operation, and usage of Viotel's Vibrating Wire Node.

Please read and completely understand this user guide in order to make sure the safe and correct use of the system as well as maintain the longevity of the device.

Protection provided by the equipment may be impaired if used in a manner contrary to this user manual.

The antenna must be plugged in before any operation occurs.

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

This product must not be disposed of in the normal waste stream. It contains a battery pack and electronic components and so should be recycled appropriately.

1.2 Theory of Operation

The Vibrating Wire node is a low touch Internet of Things (IoT) device. It is designed to as simple as possible to install, plug required sensors in, activate, set, and forget. Data is retrieved from the device via our cloud-based platform or via API to yours using the integrated LTE/CAT-M1 cellular communications. The device also uses GPS for time synchronisation where comparison of events between nodes is required.

The device is always monitoring for events, and can be continuously monitoring, or set to a triggered state and upload data in seconds. Remote configuration is possible to change the acquisition, calibration, and upload frequency.

1.3 Parts List

PART	QTY	DESCRIPTION
1	1	Vibrating Wire Node
2	1	Battery pack* (pre-installed on the Node)
3	5	Caps (pre-installed on the Node)
4	4	Sensor Plugs
5	1	External Power Plug
6	1	Antenna
7	1	Magnet
8	1	Pole Mounting bracket (optional)



Table 1 Parts List

*Externally Powered Vibrating Wire Nodes will not include internal batteries.

1.4 Required Tools

Tools are not required for installation other than hand tools specific to your installation scenario.

The following tools are required for connecting your sensors to the device.

- Soldering equipment

1.5 Dimensions

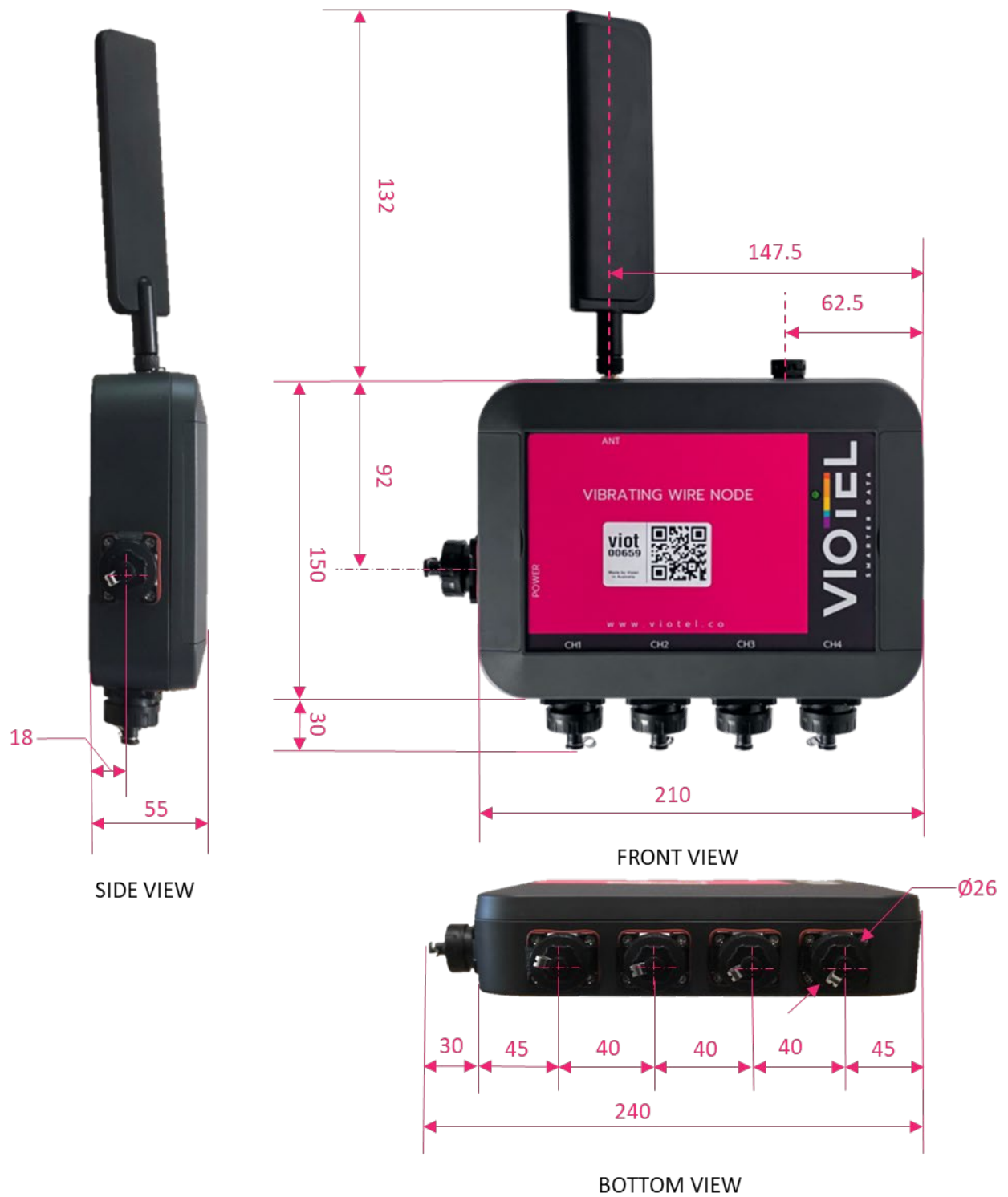


Figure 1 Dimensions in mm

2 Usage

2.1 Mounting Options

Viotel’s Vibrating Wire Node comes with two primary mounting options.



MOUNTING	PHOTO DESCRIPTION
<p>1. Threaded M3 Holes suitable for optional pole mount bracket or mounting to an enclosure.</p>	 <p>Figure 2 Node Rear</p>
<p>2. Covered Mounting holes</p>	 <p>Mounting points designed for M5 bolts or screws.</p> <p>Figure 3 Node Front</p>

Table 2 Mounting Options

2.2 Indicated Key Location

WARNING: The antenna must be screwed into its designated antenna jack before any operation of the device.

The switch that the magnet (Part 7) operates on the Vibrating Wire Node (Part 1) is located in the top right corner of the device.



Figure 4 Photo highlighting location of the Magnet

2.3 Sensor Plugs

You are supplied with 4x Sensor Plugs (part 4) for soldering to your chosen vibrating wire sensor to.

PIN	DESCRIPTION
1	Sensor +
2	Sensor -
3	Thermistor +
4	Thermistor -

Table 3 Connection process for sensors

Viotel can supply sensors with the plugs pre-installed, or a plug to junction box for quick connection of cables.

[Viotel Vibrating Wire Node - 4 Channel](#)

2.4 External Power

7.5V DC supply is required to power your device. All electrical work must be carried out by suitably qualified technician, and in compliance with local laws and regulations.

Power adapters can be purchased from Viotel.

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3 Operating Instructions

3.1 Operation

By default, your Viotel Vibrating Wire Node will be set to Off mode. To change the mode that the logger is currently in; simply take the Magnet (Part 7) and hover it over the Indicated key location.

All operations and LED indications refer to firmware version: 3.02.14, please be aware future states may change some functionality.

TAP INSTRUCTIONS	FUNCTION	DESCRIPTION
Tap once (while in Off)	Current Status	This will light up the LED indicating the current status that this system is in.
Tap once (while On)	Diagnostic	The device will quickly record 10 data entries and upload them. Once this data has been logged, the device will return to its standard operation automatically.
Tap once, Tap again within 3 seconds	Upload and change status	This will cause the device to initiate the upload and update sequence. In total, this process should take a few seconds to complete and then set the device automatically to a new status.

Table 4 How to switch between states

3.2 System Status

STATUS	DESCRIPTION
On	In this status, the device will consistently record data given the user defined interval, check for firmware updates, monitor for user defined triggers and check for Magnet inputs (Part 4).
Diagnostic	This status will set the data recorded interval to 3 minutes and quickly record 10 entries along with GPS data. After approximately 30 minutes, the device will return to its On status automatically.
Communicating	The device is currently trying to communicate with the server to update firmware, load data and status information.
Off	The device will check for any wake-up commands, such as the Magnet (Part 3) or user defined data collection interval. Every 7-days, the device will initiate a connection to provide status updates and check for system updates. Then it shall return to a Off unless otherwise specified by the server.

Table 5 Description of Device Status

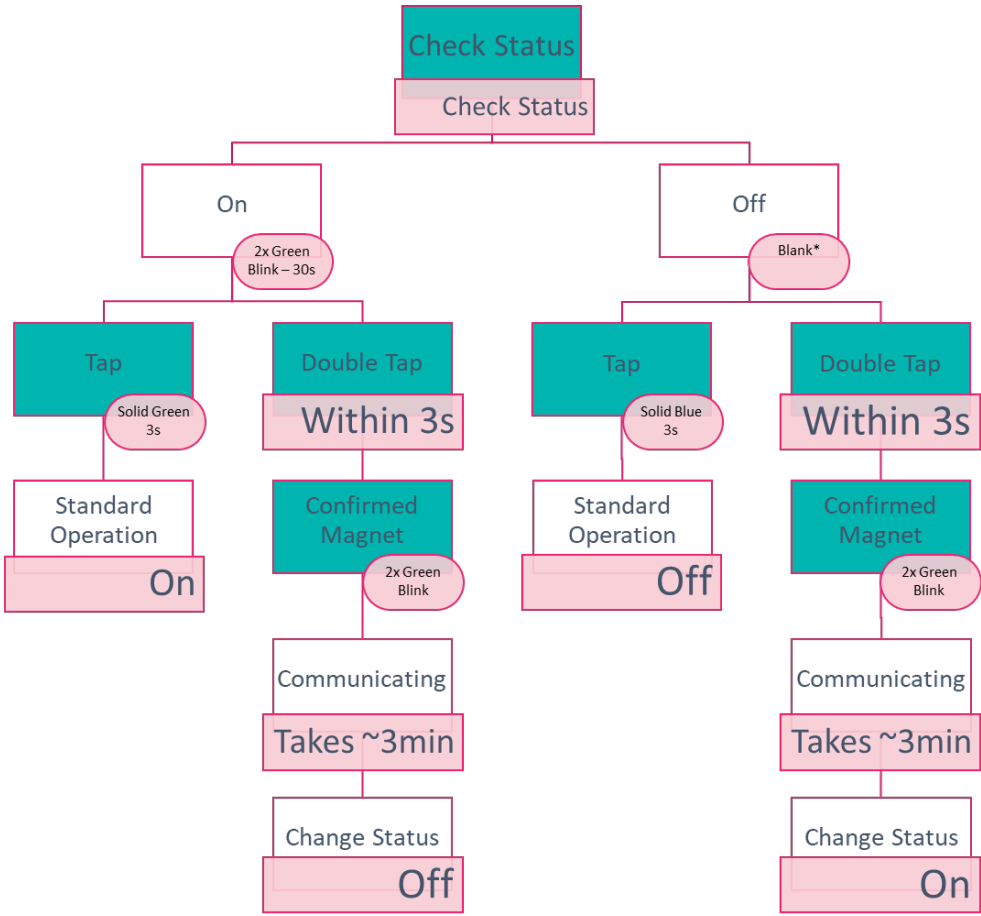


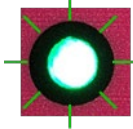

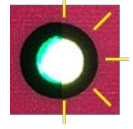
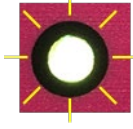

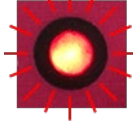
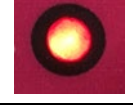
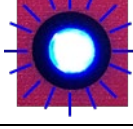



Table 6 Flow Diagram for Cycling System Status with Magnet

3.3 System Status Indicator

LIGHT	INTERVAL	MEANING	DESCRIPTION	VISUAL
Green Blink four times	1s	Successful Firmware Update	Firmware update requested, downloaded, and installed successfully.	
Green Blink Twice (100ms)	every 30s	On	Device is On, running normally. See the section 3.2 System Status for details.	
Green Blink Twice (50ms)		Status Change Confirmation	The device has confirmed that it will now switch from Off to On.	
Solid Green	<3s	Status Change Confirmation	The device has confirmed that it will now switch from On to Off	
Solid Green + Yellow Blink	3s 1s	Status Change Confirmation	Device is On and preparing to run a Diagnostic.	
Yellow Blink (100ms)	Every 1s	GPS Fixing	The device is currently acquiring a GPS signal.	
Solid Yellow	1s	GPS Fixing	The GPS signal has been acquired and successfully got a valid position.	
Red Blink four times	1s	Failed Firmware Update	Firmware update requested and failed to download.	
Solid Red (300ms)		Device is Busy	The device is currently busy and will not accept commands from the magnet.	
Blue Blink Twice (150ms)		Communicating	The device has begun Communicating, network has successfully connected.	
Solid Blue	3s	Off	Device is in Off. See the section 3.2 System Status for details.	

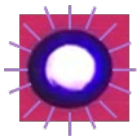


Purple Blink Twice (100ms)	Every 30s	Diagnostic	Device is On, running Diagnostic. See the section 3.2 System Status for details.	
Green/Red Alternating		Firmware Update	Firmware update requested, downloading and installation underway.	
Blank	N/A	Off	Device is in Off. See the section 3.2 System Status for details.	

Table 7 System Status Indicator

4 Maintenance

The product should not require any maintenance after installation. If the need to clean the product should arise, use only a damp cloth and mild detergent. Do not use any solvents as this may damage the enclosure.

Only service personnel authorised by the manufacturer may open the inner enclosure. No user serviceable parts are located inside.

4.1 Downloading Data

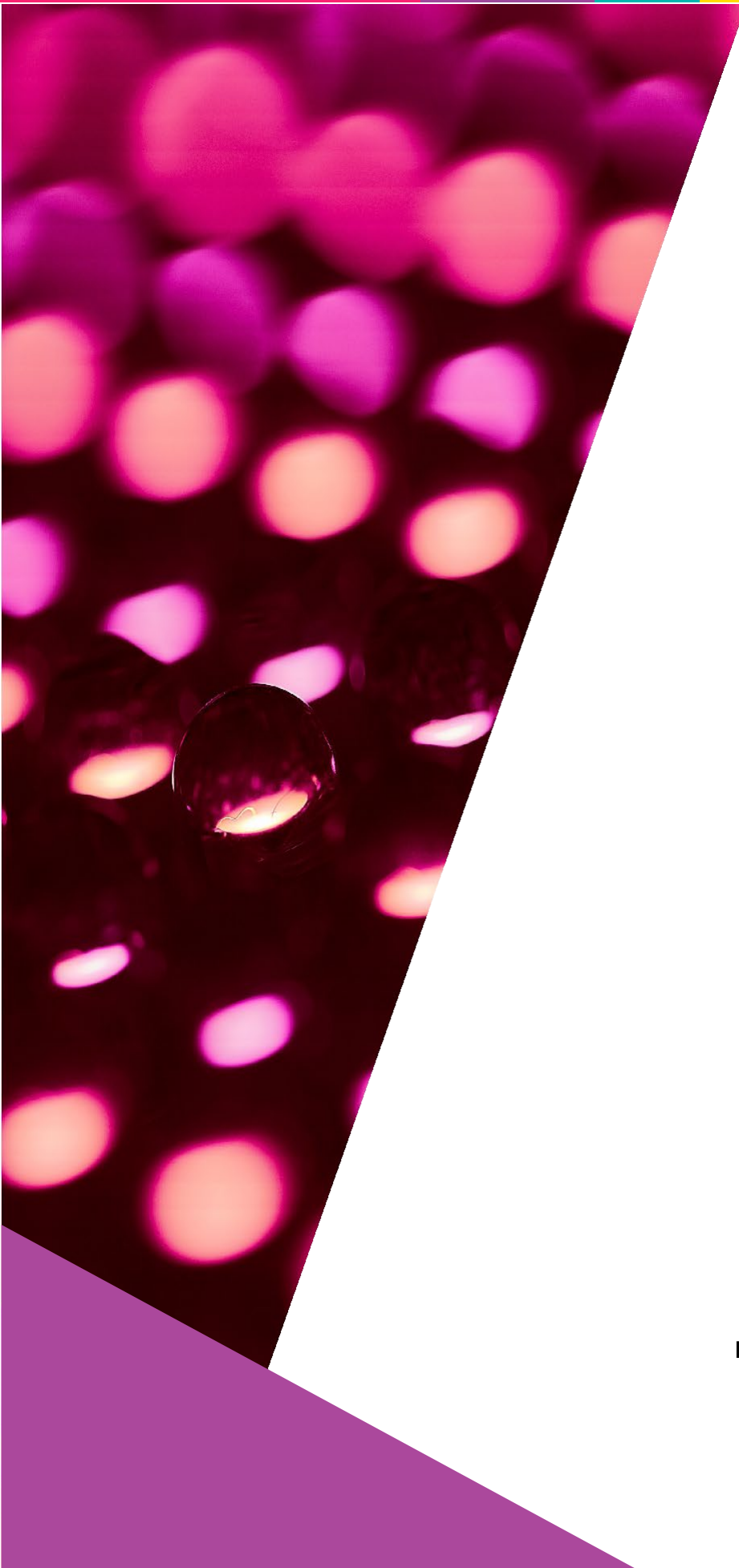
The only way to retrieve data is over the cellular communications. This can be activated on demand using the Magnet. However, if the device is in the field and is unable to upload data, the device is programmed to keep trying in decreasing increments to conserve battery. If after 4 days of attempting to upload, it will reboot.

Data is stored on non-volatile memory; therefore, it is stored when rebooted and after power loss.

Data is deleted from the device once successfully uploaded.

4.2 Further Support

For further support, please email our friendly staff at support@viotel.co with your name and number and we will get back to you.



Viotel Offices

Sydney

Suite 3.17, 32 Delhi Road
Macquarie Park, NSW, 2113

Auckland

Suite 1.2, 89 Grafton Road
Parnell, Auckland, 1010

Remote Offices: Brisbane, Hobart

support@viotel.co | viotel.co