VIOTEL
SMARTER DATA
Version 2.1 Node
Accelerometer

VIOTEL Version 2.1 Node Accelerometer User Manual

Contents

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Product Specifications

- **Model:** Accelerometer Node
- **Version:** 2.1
- **Manual Revision:** 1.2 (10 January 2024)

Product Information

The Accelerometer Node by Viotel is a low-touch Internet of Things (IoT) device designed for easy installation and activation. It retrieves data through a cloud-based platform or API via integrated LTE/CAT-M1 cellular communications. The device utilizes GPS for time synchronization when event comparison between nodes is necessary.

Parts List

Part	Qty	Description
Accelerometer Node*	1	–
Battery pack**	1	(pre-installed into the node)
Cap	1	–
Magnet	4	–

Required Tools

- T10 Torx Screwdriver
- Thin Needle Nose pliers

Product Usage Instructions

Mounting Options

Two-Sided Adhesive Mounting:
Clean and dry the mounting surface. Peel off the red plastic layer on the back of the node and firmly press it onto the required location. Maintain pressure for approximately 20 minutes to achieve 50% bond strength at room temperature.

Threaded M3 Holes:
Suitable for optional pole mount bracket or mounting to an enclosure.

Side Mounting holes:
Designed for M5 countersunk bolts or screws.

FAQ

- **What should I do if the device is not responding?**
  Try resetting the device by following the instructions in the user manual. If the issue persists, contact customer support for further assistance.
- **Can I use this device without an external antenna?**
  Yes, the device can function without an external antenna, but it is recommended to use one for optimal performance in certain scenarios.

Introduction

Warning

- This guide intends to assist in the preferred mounting, operation and usage of Viotel’s Accelerometer 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 node.
- Protection provided by the equipment may be impaired if used in a manner contrary to this user manual.
- Changes or modifications not expressly approved by Viotel Limited could void the user’s authority to operate the equipment.
- If External Antenna is select, both antennas must be plugged in before any operation occurs.
- 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.

Theory of Operation

- The Accelerometer is a low touch Internet of Things (IoT) device. It is designed to as simple as possible to install and 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 sensor is always monitoring for events, and can be continuously monitoring, or set to a triggered state. Remote configuration is possible to change the acquisition and upload frequency.

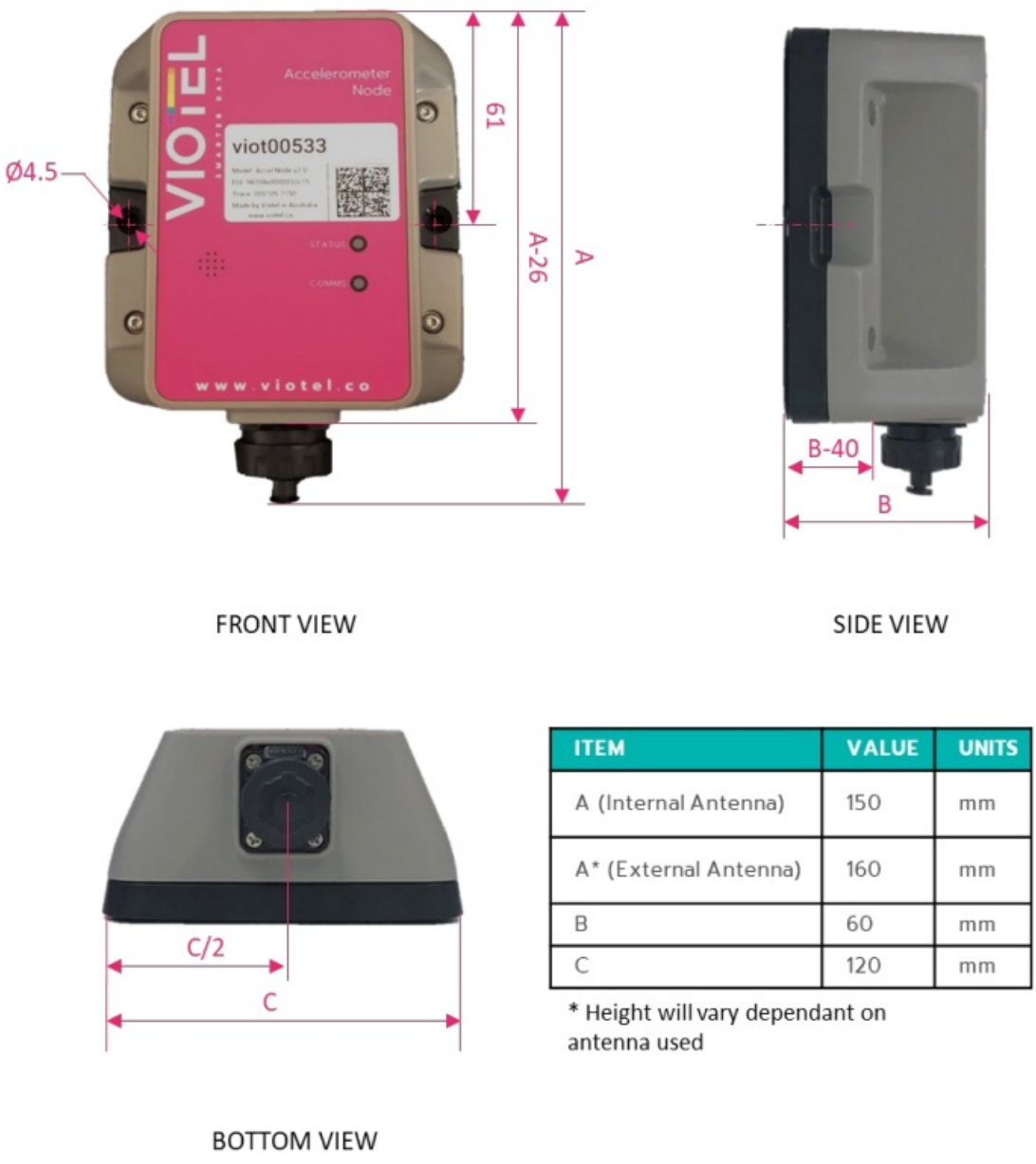
Parts List
The Viotel Accelerometer has an optional addition including external antennas*, external power** and mounting kits, please contact **sales@viotel.co** before ordering.

1. 1 Accelerometer Node*
2. 1 Battery pack (will be pre-installed into the node)**
3. 1 Cap
4. 1 Magnet

Required Tools

- Tools are not required for installation other than hand tools specific to your installation scenario.
- The following tools may be required for changing the batteries.
    - T10 Torx Screwdriver
    - Thin Needle Nose pliers

Dimensions



ITEM	VALUE	UNITS
A (Internal Antenna)	150	mm
A* (External Antenna)	160	mm
B	60	mm
C	120	mm

* Height will vary dependant on antenna used

Figure 1 Dimensions in mm

Usage

Mounting Options

Viotel's Accelerometer Node comes with three primary mounting options. It is recommended that a combination of two is used for optimal use.

1. **Two-Sided Adhesive**

   Clean and dry the mounting locations surface. Peel off the red plastic layer on the back of the node and firmly press it onto the required location. Keep the device and surface under this same pressure for approximately 20 minutes (to achieve 50% bond strength in room temperature).
2. **Threaded M3 Holes**

   Suitable for optional pole mount bracket or mounting to an enclosure.
3. **Side Mounting holes**

   Side mounting points designed for M5 countersunk bolts or screws.

Orientation & Magnet Location

Figure 2 Photo showing X, Y, Z Axis Orientation & Magnet Location

The switch that the magnet (Part 4) operates on the Accelerometer (Part 1) is located between the STATUS LED and the COMMS LED indicated by the ‘X’.

Operating Instructions

Operation

- By default, your Viotel Accelerometer Node will be set to Off. Wherever instructed to hold the magnet in place, do so at the spot indicated in section 2.2 Orientation & Magnet Location. Release from this position will send through the specified command.
- At each function, the STATUS LED will light up once with its colour represented by its current status.
- All operations and LED indications refer to firmware version dated February 2023. Please be aware states may change some functionality between firmware versions.

HOLD INSTRUCTION S	FUNCTION	DESCRIPTION
Hold 1 second	Current Status	This will light up the LED indicating the current status that this system is in.
Hold 4 seconds	On/Off	This will stop all operations and switch the current status. While On: In this status, the device will consistently record data given the user defined mode, check for firmware updates, monitor for user defined triggers and check for Magnet inputs (Part 4). While Off: The device will check for any wake-up commands, such as the Magnet (Part 4). Every 7-days, the device will initiate a connection to provide status updates and check for system updates. Then it shall return to Off status unless otherwise specified by the server.

Figure 3 Flow Diagram for Cycling System Status with Magnet

Modes

STATUS	DESCRIPTION
Trigger	The node will continuously monitor and collect raw data, sending data only once an event has occurred. State of health information is still sent at regular intervals. This mode supports two trigger states: Ratio of Averages: The node will send data relating to a trigger caused by the exceedance of the ratio between the short-term average (STA) number of samples and the long-term average (LTA). Fixed Value The node will send data relating to a trigger caused by the exceedance of a predefined upper and lower threshold.
Continuous	The node will continuously monitor, record and upload raw data. State of health information is sent

System Status Indicator

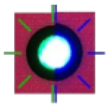
LIGHT	INTERVAL	MEANING	DESCRIPTION	VISUAL
Green Blink Twice (100ms)	every 30s	On	Device is On.	
Green Blink/Blue Blink		Initialisation	The device is first initialising and will return to its previous state. Only seen when power is first connected.	
Solid Blue		Off	Device is in Off.	
Purple Blink		Command Confirmation	Device has confirmed the command from the Magnet.	
Solid Red (300ms)		No Device Action or Device is Busy	The device is currently busy and will not accept commands.	
Yellow Blink		Event Detected	While in this Trigger mode, the device will indicate when an event is triggered.	
Blank	N/A	Off	Device is in Off.	

Table 4 System Status Indicator

System Communications Indicator

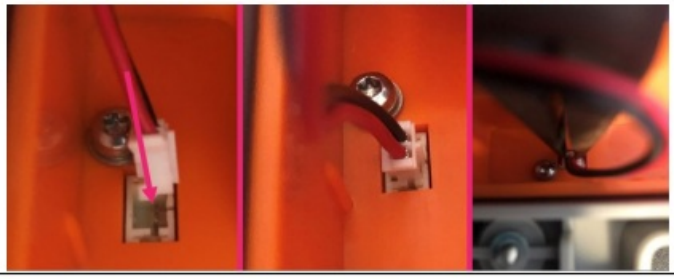
LIGHT	INTERVAL	MEANING	DESCRIPTION	VISUAL
Green/Red Blink Alternating		Firmware Update	Firmware update requested, downloading and installation underway.	
Yellow Blink (100ms)	Every 1s	GPS Fixing	The device is currently acquiring a GPS signal.	
Solid Yellow	1s	GPS Fixing	The GPS signal has been acquired and successfully got a valid position.	
Solid Red	1s	GPS Fixing	The GPS signal has not been acquired and failed to get a valid position.	
Solid Red	2s	Communicating	The device will stop Communicating, failing to reporting any data.	
Blue Blink Twice (150ms)		Communicating	The device has begun Communicating, network has successfully connected.	
Blank	N/A	N/A	Device is not communicating.	

Table 5 System Communications Indicator

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.

Changing Batteries

STEP	DESCRIPTION
1	Please ensure the node is Off before proceeding.
2	Using the T10 Torx Screwdriver, unscrew until the 4 bolts on the front of the node's enclosure are loose. Please note that the bolts are designed to remain in device section.
3	Flip over the top half of the enclosure making the battery pack is clearly visible. Position two fingers around the battery and firmly pull up; the battery should pop out of its holder. Ensure you do not pull or rip the red & black cables attaching the battery pack to the device. 
4	Gently pull out the exposed plug connecting the battery to the device. Please dispose of this used battery pack correctly based on legislative requirements.
5	Gently push the new battery packs plug into the devices socket. A pair of thin needle nose pliers may be required to confirm it has been adequately plugged in. 
6	Slide the battery pack into position and push firmly on the battery until it clicks into place.
7	Once the device is screwed back into the base, your node can be safely turned back On. 

External Power

- 5.0-7.5V DC (1A max) 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.

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. If after 4 days of attempting to upload, it will reboot.
- Data loss may occur during extended power loss periods.
- Data is deleted from the device once successfully uploaded.

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.

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Documents / Resources

	**VIOTEL Version 2.1 Node Accelerometer** [pdf] User Manual Version 2.1, Version 2.1 Node Accelerometer, Version 2.1, Node Accelerometer, Accelerometer

References

- Viotel - Smart Monitoring Solutions
- Viotel - Smart Monitoring Solutions
- User Manual