



vitalbase
IoT FOR A SAFER LIFE

Vibby Oak The Automatic Fall Detector



TELECOM DESIGN



VitalBase is the Healthcare Business Unit of Telecom Design

www.vitalbase.co.uk

Introduction

With 10 years of experience in the fall detection combined with a key expertise in sensor signal processing, the Vibby OAK is the new generation of automatic fall detector from VitalBase. With an improved algorithm, the Vibby OAK is a real evolution compare with the former generations, which have been successfully known in Europe with more than 300 000 items sold. With an equivalent design to the IoT “Internet of Things”, adding a new sensor along its new algorithm make it a powerful device, which can be wrist and pendant worn.

Preamble

The protection of vulnerable persons is a market influenced by constantly changing demands and advances in technology. Anticipating new demands leads us to integrate new features and addressing new markets to meet the safety needs of the elderly and other vulnerable people. Studies led us to the problem of automatic fall detection with the aim of improving personal safety at home by generating an automatic alarm after a serious fall is detected.

The VIBBY Oak’s solution

Nearly half of the falls occur in the bathroom while washing or dressing and a significant proportion occur at night.

For an effective protection, the device should be permanently worn.

The presence of the manual trigger remains vital for voluntary call.

The automatic fall diagnostic does not replace the push button but takes place as a complement to voluntary call for certain situations.

Consequently, the Vibby OAK has been designed to only detect heavy/dangerous* falls which due to their intensity cause the wearer lying on the floor for a period of time **with or without activity** not recovering then a standing position and being unable to trigger the push button. In the other cases it is considered that the call can still be made by pressing the manual trigger. Our objective is thus to detect dangerous falls causing **potentially** unconsciousness. This approach allows the limitation of false alarms.

The fall detection

The Vibby OAK product truly complements to voluntary call feature, by proposing an automatic detection / diagnostic of **heavy-dangerous falls** function to its wearer lying on the floor with or without activity with a non - recovery of altitude state being unable to press the manual trigger.

It is important to track down isolated persons unable to push the manual SOS trigger lying on the ground after an heavy fall. This event can have tragic consequences such as body damage or failure. In this case, an automatic call to the home base units is necessary.

An heavy - dangerous fall is characterized by 4 steps:

- 1) A body standing position with activity followed by
- 2) A quick and sudden lost of gravity/ lost of verticality of the body followed by
- 3) A Strong and significant body impact on the floor followed by
- 4) A lying position on the floor with or without activity of the body, the wearer being unable to press the manual button and to recover a standing position after the fall (non altitude recovery over 60cm and for a period superior of 6 seconds)

If these four phases have occurred, then an automatic alarm to the receiving home base unit could be activated.¹

Example of fall types:

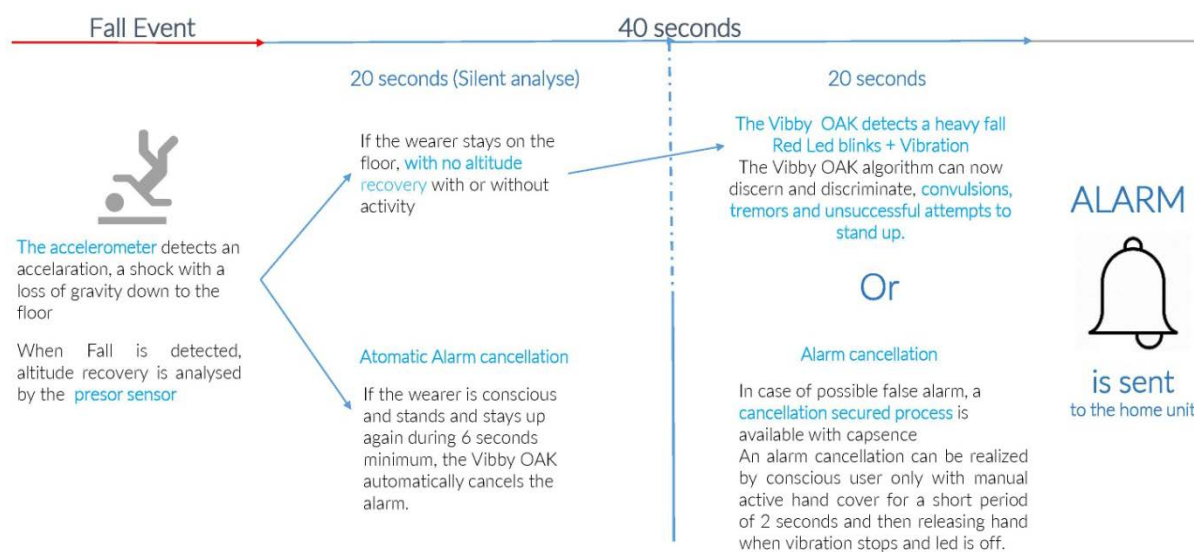
An heavy or violent fall which occurs in every day life, in the bathroom, or during normal activity by moving in the habitat (go to bed, walk, go up / down stairs etc...), followed by a non-recovery altitude.

This approach to fall detection considerably reduces the false alarm rate.

Following a fall, the alarm is only sent after a short lapse time during which there is no complete body stand-up detected. Finally, the Vibby OAK limits the false alarms when the wearer is bending down, dancing, applauding, lying down, doing odd jobs or even bagging an arm against a door and still walking.

Furthermore, in order to reduce efficiently the rate of false alarms, **in certain circumstances** such as altitude recovery of the wearer further a sudden fall or not, the Vibby OAK will not raise an alert, **always giving priority in such cases to the manual trigger**.² In this case, we estimate the wearer standing up again, is able to activate the manual trigger.²

The Vibby OAK algorithm is designed to reduce the false alarms number without being able to remove them completely. In order to limit the rise of these false alarms to the call center, the Vibby OAK is equipped with a vibrator and a capacitive sensor.



¹ The fall detection technology of the Vibby Oak solution does not allow analysis and interpretation of all fall situations. Soft falls, slumping falls, descent controlled falls against a wall or a chair, etc...are not detected by the Vibby Oak.

Moreover, In spite of its algorithm capabilities considering the technologies used and our target to generate as less as possible false alarm, all falls even dangerous-heavy falls can not be detected, this is the reason why **the presence of the manual trigger remains vital for voluntary call**.

² It is possible that in certain cases further to a fall, the wearer is not capable of activating the manual trigger by himself and the Vibby Oak having detected an altitude recovery, does not activate an automatic call to the home unit.

Warning

Wearing the Vibby Oak

To work correctly, the Vibby OAK must be wrist or pendant worn by user 24 hours/day. Any other use may cause unjustified alarm and/or will not protect is wearer. Due to the wide variety and type of falls, some falls may not be detected.

We highly recommend to test Vibby Oak in all rooms for good pairing with the home unit and the radio range. If the product is not programmed correctly, professional will have to control installation.

The Vibby OAK is worn on the wrist like a watch or as a pendant around the neck. Wearer needs to keep it 24 hours a day even during the shower or at night during the sleep, which are life phases with highest level of falls occur (almost half of falls occur in the bathroom and a significant proportion occurs at night). However, it may not detect a fall from a lying position in bed to the floor.

The Vibby OAK has to be configured pendant or wrist worn by a professional at first use. Once setup, wearer should not change the wearing accessory without contacting his supplier.

We highly recommend wearer to test functionality of the Vibby OAK once a month by pressing the alarm push button and control the led blinking.

If the Vibby OAK is worn under clothing, wearer will take special attention to keep easy access to the alarm push button.

Regarding wrist worn on active wearer; we recommend to wear the Vibby OAK on opposite writing arm or as pendant to reduce false alerts.

Cleaning: If necessary Vibby can be cleaned with a damp cloth or with soft soap and water avoiding all kinds of corrosive detergents. Once cleaned, Vibby has to be worn again for protection.

Technical specifications

Water resistant (IP67) - Shock resistant (IK7 standard)

Dimensions: 37mm x 33mm- Thickness: 12.7 mm - Weight: 35g

Stainless steel chromed hypoallergenic (FDA) - Watchband : Hypoallergenic rubber

Social alarm 869.2125 Mhz - Bi-Directional Transmitter

The Product shall be powered by a replaceable 3 V Lithium Sony CR2477 button cell battery.

The average battery life time is 24 months. However, various parameters may have an impact on the battery life such as wearer activity, number of trigger calls, temperature, product worn or not which at the end may reduce the battery life.

We do highly recommend our customers to change all batteries as a preventive service each before 24 months. Keepalive feature helps customers to detect a low battery situation. Keepalive radio frame is sent every 23 hours.

Product Functions

Manual Alarm

At any time, the alarm can also be triggered by a simple pressure on the push button. Acknowledgement is confirmed by a vibration and the red LED lights steadily.

Automatic Alarm

Vibby OAK detects a heavy fall further 20 seconds of silent analyze followed by vibration with red LED blinking for 20 seconds before the alarm gets transmitted to the home unit. Alarm cancellation occurs only when the person stands up for (6sc) after the fall.

Alarm cancellation feature with capsense

Before sending automatic fall detection alarm to the home unit, Vibby OAK vibrates and the red LED is blinking during 20 seconds period.

During this specific period, an alarm cancellation can be realized by conscious user only with manual active hand cover for a short period of 2 seconds and then releasing hand when vibration stops and the LED is off.

New algorithm

The Vibby OAK algorithm can now discern and discriminate, convulsions, tremors and unsuccessful attempts to stand up.

Certifications

- Europe CE; EMC EN55022, ETSI EN 301-489-1 Class 1, ETSI EN 301 489-3;
Safety EN 60950; Social Alarm EN50134-2, EN 50130-4; Radio ETSI EN 300 220-2