VerticalMan

"Man down" App for android devices

The complete guide

Guide revision 36

Summary

1. Introduction

The application VerticalMan allows the noticing of the dangerous situation "Man down"

The feature "Man down" allows to monitor the worker's posture, warning locally with an alarm (visual and acoustic) and notifying remotely (through web service, phone call, email, VoIP call or SMS) if there is an inclination over an angle, maintained for a period of time.

The system is aimed mainly at lone workers, who do not have a colleague next to them and without continuous direct contact with other people.

2. Required by law

Many countries have specific law to safeguard lone worker:

For example:

- In Italy art.45 of TU 81/2008
- In UK the BS8484:2016
- Canada Bill C-45

3. Who needs it

In general, all workers that do activities alone.

Below is a partial list of categories of lone workers:

- Industrial maintainers
- Cleaning staff
- Nocturnal CED operators
- Server rooms systems administrator
- Lab technicians
- Security guards
- Agricultural operators
- Commitments to the public of small businesses
- Hydrogeological systems maintainers
- Nocturnal pharmacists
- Night-time medical care operators
- Telephone operators maintainers
- Industrial or handicraft production or maintenance employees
- Railway workers

4. What does the VerticalMan solution offers

VerticalMan is an Application installed on an Android device, it allows to control a lone worker's vertical posture that could operate both outdoors and indoors.

In the case of the worker's "horizontal" status permanence, the rescuers is warned through a GSM phone call, an email, a VoIP call, an SMS or through a web call to an corporate alarm management system. All notification alarm channels can be activated at the same time.

The solution VerticalMan is completed with to the server components for the centralized alarm management, eCoRo Web or only the centralized configuration management eCoRoLite, the App eCoRo to receive the SMS alarms and the AWSI forms to interface with centralized SCADA systems

5. VerticalMan functionalities

"Man Down" alarm	✔
"Motionless Man" alarm	✔
Low battery level alarm	✔
Rescue request alarm, SOS	✔
Panic alarm (Panic Button)	✔
Wrong configuration alarm	✔
No connectivity alarm (GSM or WiFi)	✔
No GPS signal alarm	✔
Impact Alarm	✔
Vehicle accident Alarm	✔
Temporary alarm suspension decided by the operator	✔
Alarm notification via GSM phone call in speakerphone mode with the possibility to register the conversation (up to 5 phone numbers)	✔
Alarm noticed through SMS from GSM or Wi-Fi	✔
Alarm notification via Web service call	✔
Alarm notification to SCADA	✔
Alarm noticed through Email	✔
Alarm noticed through VoIP call (SIP; Skype; What's App)	✔
Sending GPS coordinates with Google Maps link or OsmAnd (OpenStreet)	✔
Sending accurate indoor position with Beacon network (IPS)	✔
Exit from the application with an administrator password	✔
High configurability protected by an administrator password	✔
Centralized configuration	✔
User interface language	Italian English

Alarm pause

The administrator could configure the presence of the "Alarm Pause" button on the App, allowing the operator to suspend the alarms, for a determined number of minutes, in the case he must do activities that request a position that activates alarm.

GPS positioning

It is possible to configure the acquisition of the GPS position either using the system offered by the Android system which provides for choosing the best position between that offered by the GSM operator, the Wi-Fi, the Bluetooth connection and that offered by the satellites.

In addition to this mode, suggested by Google to have a major accuracy and a saving on the battery use, VerticalMan allows to request the GPS positioning only from the satellite. This because in some areas and for some GSM operators, leaving the choice to the operative system is not the major accuracy solution. In addition if you use the indoor positioning system (IPS) with beacon, it is strongly suggested to request the GPS position only from the satellite, to avoid to give distort positioning offered by the GSM operator that allows the receiving also indoor but with possible localization mistakes up to some hundreds of meters.

Panic Button

It is possible to associate to VerticalMan a Panic Button that the user could use in dangerous situations without the necessity to access to VerticalMan which however must be in the user's neighborhood.

The Panic Buttons are connected to VerticalMan through Bluetooth link.

The Panic Button could be configured to start the classical SOS alarm that warns locally before the remote notification, or like a Silent Alarm that does not require any local signal, but only the remote one for that situations in which is important don't give evidence that the alarm was started. For instance: aggression, attempted theft, etc.

To add a Panic Button is sufficient to go to VerticalMan's configuration, enable it and select the Panic Button among those made available.

At the moment are supported Flic Bluetooth Buttons that need to have installed on the device the homonymous application to be then associated with VerticalMan.

It is a Smart Button with excellent characteristics of both reliability and battery life.

Configure Flic Button as a Panic Button

1. Install the Flic application from this site
   https://play.google.com/store/apps/details?id=io.flic.app
2. Add your own Flic button from the application (It is not necessary to associate any function with the click, Double click or hold) and name it
3. Log into VerticalMan configuration
4. Turn on the "Panic Button"
5. Click on "Select Panic Button" and select the Flic button just configured in the Flic app
6. Indicate in "PanicAlarm" what type of alarm activate when the Flic button is pressed. SOS or Silent (in case of Silent, remember to deactivate the sound also in the Flic App and to not set the notification through phone call because the ringing of the phone could be audible as well as the voice of the rescuer responding)

6. Peculiar characteristics

6.1 Notification on Wi-Fi network

The VerticalMan special feature, compared to the competition, is surely the possibility to notify the alarm through Wi-Fi connectivity, to be independent from the GSM operator.

This allows to:

- Use VerticalMan also in places where there is not GSM signal (indoor areas of some buildings, underground locals, etc.)

- Not be linked to the unavailability of the service offered by thirds part (GSM operator) in case of emergency

- Do not need a GSM SIM that must be managed also administratively to maintain it active

- Could monitor the functioning of your own network devices that contribute to make the entire system extremely secure

VerticalMan indoor scenario
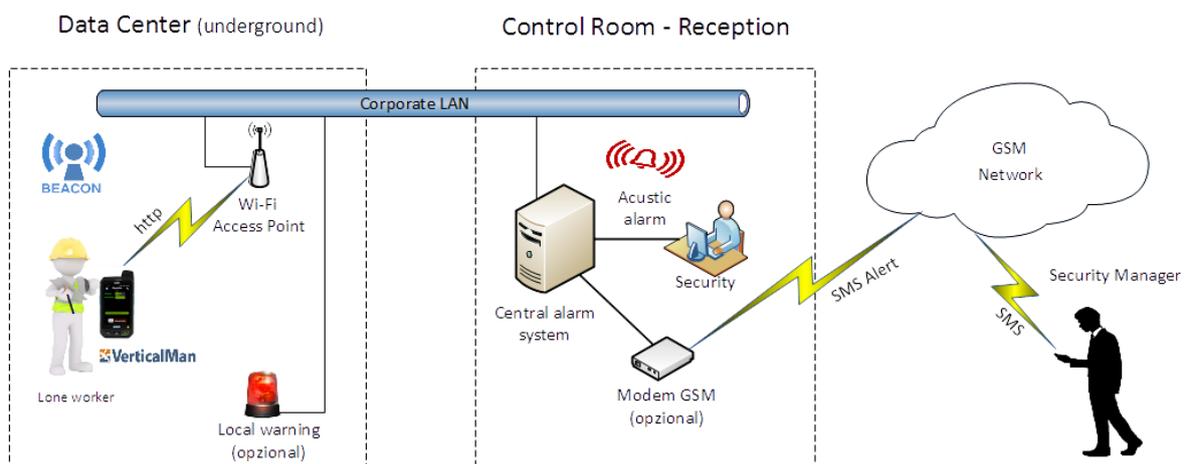
IPS (Indoor Position System) – Indoor positioning with a Beacon

Only the GPS positioning is not enough if the lone worker operates also in indoor areas of buildings where the satellites signal cannot reach the device with VerticalMan.

To exceed this limit, VerticalMan allows to find the position in a building through the use of a Beacon network.

If the IPS is turned on, VerticalMan intercepts the Beacons in the neighborhood, that were previously registered with an identification and a linked area name that indicates the indoor position (ex. Meeting Room First Floor), and sends the area name in the SMS, Web and email notification

Each beacon will be registered in the VerticalMan configuration in the Position section -> IPS areas indicating:

- UUID of the beacon assigned during device configuration
    - The iBeacon ID Format : (UUID-Major-Minor).
        - UUID must contains 32 hexadecimal digits, split into 5 groups, separated by hyphens.Each of the 5 groups must contain the following number of characters per section:
        - First section: 8;Second section: 4;Third section: 4;Fourth section: 4;Fifth section: 12
        - The Major and Minor are two hexadecimal digit.
        - Example: UUID=12345678-1234-1234-1234-123456789012
        - Major=5
        - Minor=80
        - ID=12345678-1234-1234-1234-123456789012-5-80
    - The Eddystone-UID is 20 hexadecimal digit Ex: ff63c60b69a3dc2a7259
- Unique identifier assigned by the company to the area. Ex. P001
- Area name to indicate the area covered
- RSSI Min: minimum value of the beacon signal strength to be considered valid. If set to zero it is not considered, otherwise it allows to indicate the minimum power to prevent the signal interfering with other neighboring areas. Ex set to 80 we will consider the area only if the signal strength will be very good.

If the worker with VerticalMan operates both outdoor, where the GPS signal is receivable, and indoor, where there are beacons it is possible to indicate in the notification SMS only one of the two positions. The IPS position has always the priority and when it is not receivable, the GPS position is used. If both positions are not available, in other words the current position cannot be detected, the last IPS position indicating the last step in the beacon radius can be sent. For major details please view the "variable fields" chapter of the Configuration Manual for "GoogleMapOrIPS".

Most common commercial beacons are supported, included those with the Atex certification to work in dangerous areas, for example the Ecom Loc-Ex 01

To determinate the number of beacons and their positioning and configuration, it is necessary a special analysis project that could be done by the customer's qualified staff or by Aldea technicians.

IPS with Wi-Fi

In case the VerticalMan operatively place is always under the Wi-Fi connectivity coverage, it is possible to use the identification of the access point (SSID and/or BSSID) as a basic indoor positioning system; it is a less accurate and advanced system than the beacon network, but in some situations could be easy to implement without additional costs. In the configuration it is possible to define for every BSSID an area name.

If the worker with VerticalMan operates both outdoor, where the GPS signal is receivable, and indoor, where there are beacons it is possible to indicate in the notification SMS only one of the two positions. For major details please view the "variable fields" chapter of the Configuration Manual for "GoogleMapOrWiFi".

From version 5.0 it is not necessary that the smartphone is connected to the Wi-Fi network with which the position is identified. Furthermore, it is possible to indicate the minimum rssi (signal strength) value to consider the network acceptable as positioning.

Hybrid IPS - Wi-Fi Beacon

It is possible to simultaneously activate indoor positioning with beacon and Wi-Fi. In order to be able to notify the most updated position (outdoors or indoors) it is necessary to use the "Position" variable field documented in the configuration manual.

7. Alarms

VerticalMan allows to detect many different alarms described following.

Except for the Man Down and Wrong Configuration alarms, all the others can be deactivated by configuration.

7.1. Alarm - Man Down

At the inclination limit overcoming, the user is warned about the local alarm situation, for a configured number of seconds; after this period of time, if the user has not voluntarily interrupted the Local Alarm, the alerts for remote notification are started using the configured communication channels.

7.2. Alarm Motionless or Immobility

If the user remains motionless for a configured number of seconds, the motionless alarm starts.

For some devices (ex. Unihertz Atom) it is necessary that the "Screen always on" parameter is activated in order for this alarm to work even when in stand-by mode.

7.3. Alarm SOS

The user press voluntarily the "SOS" button of the application. The user has 5 seconds for undo the operation, after this time the remote alarm notification procedure is activated.

Since the GPS position in 5 seconds may not be updated, a second notification can be configured that starts automatically after a maximum of 2 minutes from the first.

This twice notification is only active for Web notification or SMS and emails containing the GPS position.

For some devices that have programmable physical buttons it is possible to associate them with the SOS alarm. The supported devices are indicated in the configuration documentation ((SOS_keycodes parameter).

7.4. Alarm Panic Button

It is possible to configure an external Panic Button to the VerticalMan device and connected through Bluetooth, that when it is pressed, it activates the remote notification of a silent alarm or the SOS alarm with acoustic and local sound alarm.

7.5. Alarm Low Battery

If the battery charge falls below a configured percentage value, a visual and acoustic warning is triggered locally and notified remotely via the chosen communication channels except voice call.

Should the mobile application not be running and there are low-battery alarm conditions with the notification configured via the web, a communication to the central system is sent in any case.

7.6. Wrong configuration

Should one of the following conditions occur, the alarm is triggered:

1. No device identifier has been defined
2. No remote alarm channel notification has been chosen

Should the selected remote notifications not have the corresponding parameters compiled. E.g. if you chose a web notification, the URL call sign must also be completed

7.7. Unavailable connectivity

Should the remote web notification be chosen, the Wi-Fi connectivity is always checked for availability.

If the GSM or SMS call notification has been selected, the presence of GSM connectivity is checked.

7.8. GPS signal absent

Should the GPS signal be not available for a few minutes, the local alarm is triggered and possibly also the remote notification.

7.9. Impact alarm

If the device has an acceleration beyond a certain threshold, this alarm is raised.

7.10. Vehicle Accident Alarm (beta)

If the device is on a moving vehicle and the acceleration is greater than 15g, this alarm is raised. This is an alarm that is still provided in beta mode due to difficulties in practical testing.

7.11. Social distancing alarm

Check if nearby (about 2mt) there is another smartphone with VerticalMan (with the same active control) or an App compatible with the "Privacy-Preserving Contact Tracing" of Google and Apple.

It is possible to configure the sensitivity of the proximity detection (carried out through the received signal strength, RSSI) since the reception depends on the quality of the Bluetooth sensor of the smartphone.

At excessive approach, a local audible alarm is played but it is not notified remotely, moreover the device to which one approached is not even tracked.

7.12. Old position alarm

VerticalMan verifies that certain minutes have not passed since the acquisition of the position (GPS, IPS or WiFi), possibly alerts locally.

In addition to controlling the positioning system, it can also be used to warn the operator that he has been in an area for a long time.

7.13. Alarm priority

When an alarm occurs, all the alarm controls with an equal or higher priority are suspended, therefore should, for example, the "Low battery" alarm (priority 3) be triggered, all the other alarms will remain active.

Following the alarms priority:

Allarme	Priorità
Man Down	2
Motionless	2
SOS	1
Panic Button	1
Low Battery	3
Wrong configuration	3
Unavailable Connectivity	3
GPS signal absent	3
Impact	2
Vehicle accident	2

7.14. Alarm deactivation when charging

It is possible to disable the alarms when the device on which VerticalMan is running is charging its battery. This allows having no notifications when the operator returns to his office and is not wearing the device.

Be careful about activating this feature if you are using portable Power Banks, while the isolated operator performs his duties, as the system would be totally unsafe while the device is charging.

9. Channels for remote alarm notification

The application can remotely notify the alarm status with the following communication channels:

Channel	Priority	Type of notification	When it may be used
GSM network	1	Sending a text message	In environments where there is a good GSM signal available on the ground as well (at least 2 out of 5 notches). The device requires a GSM SIM card.
Wi-Fi network	2	Alarm call on a SCADA system	In environments where a Wi-Fi Intranet network is available. Where a **SCADA centralized alarm management** system is active or installable.
Wi-Fi network	2	Web page retrieval	In environments where a Wi-Fi (Intranet) network is available.
Internet connectivity	3	Sending Emails	An email is sent to the configured recipients. To be used as an additional channel to one of the main ones as emails are not a type of communication which generally receives a high level of attention upon reception.
GSM network	4	GSM telephone call	In environments where there is a good GSM signal available on the ground as well (at least 2 out of 5 notches). The device requires a GSM SIM card.
Wi-Fi network	5	VoIP call	A VoIP protocol call is started
Wi-Fi	6	SMS from Web	Allow to send SMS with only Wi-Fi connectivity

Multiple remote notification channels can be selected at the same time, in this case, notifications are sent based on channel priority; for example, should both text messages and voice calls be active, first, all the text messages are sent according to their position in the configuration and then the telephone calls are started sequentially, still according to their position in the configuration.

Alarm call on a Movicon SCADA system

The alarm is triggered directly on the SCADA-Movicon central system, through a specific web call to an "Aldea Scada Web Interface" component which communicates with the Progea Movicon system, providing variables/tags.

Web page retrieval

A web page is loaded by transmitting the identification parameters of the device. Once the server has received the call, it will take over the alarm notification. A software allowing management of the correct alarm notification procedures according to the defined VerticalMan's application protocol must be installed on the server.

The centralized software can be the Aldea eCoRo solution or an own web application which interprets the VerticalMan web notification protocols described in the document "VerticalMan - Notification protocols.pdf"

GSM telephone call

A GSM hands-free speakerphone call is started towards a configured telephone number.

The call does not include a recorded phone message, but establishes a two-way conversation between the device and the rescuer. The emergency situation is evident, even if the caller does not answer. The phone number of the mobile device with the VerticalMan application will be stored in the rescuer's phone book under an appropriate name.

It is possible to configure up to 5 telephone numbers which will be called in sequence if the alarm situation persists. It is possible to configure that the first call answered will not continue with the subsequent ones. Be careful to activate this parameter if there are telephone numbers in the chain with voicemail or an automatic answering machine is associated.

At the start of the telephone call, the communication can be recorded locally in an mp4 file for an in-depth investigation in case of need.

Sending a text message (SMS)

Up to 5 text messages requesting help are sent, with a completely configurable text. Should the GPS coordinates be activated, these will be added to the text of the message via a link to Google Maps or OsmAnd (OpenStreet Maps).

The administrator can define a specific format for each individual text message using variable fields (e.g. alarm name, type, GPS coordinates format, etc.) as described in the Configuration Manual. The following is an example of a customized text message template:

AlarmName# for the device #DeviceId# at coordinates #GoogleMap# on Wi-Fi network #SSID#

Which produces the following message for a man-down alarm:

"Man-down Alarm" for the "01 PaoloR" device at the coordinates
https://www.google.it/maps?q=45.32323,12.34344 on the Wi-Fi network "Building A1 Floor no 4"

From version 4.18 it is possible to specify in the fifth recipient the phone numbers of multiple recipients (separated by semicolons) of the messages but all formatted with the fifth model.

It is possible, in the configuration, to enable the notification of access and exit from the application via text message.

As the reception of a text message to the rescuer is usually notified with a single acoustic signal, Aldea has created the eCoRo App in order to provide the possibility to those who must receive notifications of important alarms, such as those concerning the operator's health.

When a suitably configured text message is received, eCoRo App activates the acoustic signal at the configured volume until the rescuer stops it, thus allowing, with more probability than a classic text message, to attract his/her attention. Further details on: https://www.aldea.it/en/ecoroapp/

In DualSIM systems it is necessary to indicate, in VerticalMan configuration, which of the two SIMs is to be considered primary for sending SMS for alarms notification.

From version 5.6, in DualSIM systems, if the sending of SMS, only for the notification of alarms, goes into error with the main SIM, then a new transmission is attempted with the secondary.

Email message

An email is sent to the configured recipient, allowing the variable fields to be used in both the subject and the message body in order to indicate the alarm and device location data.

To send email you can use any SMTP server that provides a classic authentication (user password), **but it is not possible to use systems that require mandatory double authentication (OAuth2) like Gmail**, because they would be unreliable in case of token expiration, for sending without user supervision such as those required for VerticalMan communications.

The email notification can also be used to send text messages in areas where there is no GSM signal through one of the many services available on Internet (e.g. https://www.smsglobal.com).

VoIP call

One single VoIP call is started to the configured recipient.

It is possible to set up SIP; Skype; WhatsApp; or Customized calls.

The VoIP client must be properly installed and configured for the call.

For example if you chose What's App call, the App must be installed and configured with your own account. Same necessity in the case of SIP server, for which you can use the App of your SIP system or one of those present on the market (eg Zoiper).

The recipient of the VoIP call changes depending on the system chosen; if for example a call has been configured on a SIP server inside the company, in the recipient it is sufficient to indicate the extension number to call, while for What's App it is necessary to indicate the complete name of the contact.

The Custom call allows you to completely define the URI to be called in case of a call with a particular protocol. Useful if you have a VoIP client that needs a specific protocol and particular parameters eg. myProtocol: recipient? video = false.

Warning: The VoIP call does not activate the speakerphone.

There are differences between a GSM and a VoIP call which are summarized in the following table

Call	Hands-free speakerphone activation	Audio recording	Suspension of local acoustic alarm while calling	Video call	Chain up to 5 calls	Recipient
GSM	✔	✔	✔	✘	✔	Phone number
SIP	✘	✘	✔	?	✘	Extension phone number
Skype	✘	✘	✘	✔	✘	Username
WhatsApp	✘	✘	✘	✔	✘	Complete name
Custom	?	?	?	?	✘	URI completed with protocol

In the case of SIP calls, some of these features may vary according to the SIP client.

Where there is a question mark, it means that the functionality depends on the VoIP client's implementation.

Since the notification with VoIP call is strictly linked to third-party apps, it is recommended to perform an accurate test at the first installation and at every update of the VoIP client.

SMS from Web

Alarm notifications can be sent via SMS with one of the services available on the Internet.

The following providers are currently supported on which the customer will need to open an account: MessageNet

It is necessary to set the user/password supplied by the provider and the telephone numbers of the recipients separated by semicolons in the configuration.

10. Integration with centralized alarm management systems

VerticalMan also allows notifying its alarms to SCADA systems through the additional Ecoro Lite or Aldea Scada Web Interface (ASWI) add-ons.

This integration allows additional features, in particular:

- Notification of start and end of the use of the VerticalMan App, if this is started and closed at the end of the work session.
- In the event of an alarm, it also notifies the nearest Wi-Fi or Beacon identification access point, for localizing the VerticalMan user within the work area.
- Automatic update of the App configuration, downloading it directly from the central system

It is possible to integrate the VerticalMan with a classic alarm central with a telephone switch or with a PBX that allows the reception of an SMS message to signal a specific alarm. In VerticalMan it is possible to configure the SMS text as required by the central device through the variable fields described in the Configuration Manual.

11. Use with external sensor

VerticalMan can operate with an external sensor (accelerometer) worn on the belt, so that the phone's position does not affect the detection of the user's posture, but is used exclusively for configurations and notifications. In practice, the external sensor takes care of detecting the posture only and of sending the data via Bluetooth to the Android device with VerticalMan installed.

Advantages with the external sensor

- The phone can be positioned freely without affecting the posture or immobility alarms
- The sensor to wear on the belt is very small and less cumbersome than any mobile phone.
- The user is not obliged to wear his/her phone on the belt

Disadvantages with the external sensor

- The sensor battery must be recharged in addition to the telephone one.
- The external sensor must be purchased

When to use an external sensor

- When the Android device is too large to be worn on the belt easily
- When it is not possible to indicate an ordinary operating position (Vertical or Horizontal) of the Android device to VerticalMan.
- When the Android device does not allow having the accelerometer sensor turned on during the Stand-by status.
- In all cases when you wish the Android device with VerticalMan and the positioning of the sensor to run independently.

Compatible sensors

The supported sensor is Metamotion-R by [MbientLab](#) , specifically designed for low power consumption and excellent precision, can be used in conjunction with the VerticalMan via Bluetooth connection, with an excellent battery rechargeable with micro-USB.

Configure the external sensor

In Advanced configuration-> External sensor choose the sensor from the list of those in proximity. If the sensor is not in the list, try pressing the sensor button or connecting it to the power supply.

Once the sensor has been chosen, it is necessary to completely exit the VerticalMan and re-enter to have the new configuration taken. An animated icon will be shown at the top left to indicate that VerticalMan is connecting with the external sensor. If you press the icon, you will have information on the sensor (Bluetooth address, connection status and battery level).

If you use the external sensor, it is very important to also activate the low battery alarm which checks both that of the smartphone and that of the sensor.

If the "No alarms in charging" function is activated, the sensor's charging status will also be checked and, in the event, no alarms associated with it will be given (eg. "Man down" or "Motionless").

It is possible to use the external sensor simultaneously with the beacon-based IPS even if both use the same Bluetooth technology.

At this link https://youtu.be/9b5Q82zhFUM, a short video for how to configure the external sensor and its operation.

12. Non-exclusive operations

VerticalMan can also be used in a non-exclusive way on an Android device on which other applications or the classic telephone functions are used.

To be able to use it this way, it is necessary to enable the "check inactivity" or "alarms only in standby" parameter in the configuration.

Depending on the device on which the VerticalMan is running, with "Alarms on Standby only" or "Inactivity verification" active, it may take several seconds for the App to wake up from the standby situation. This could lead to notifying the alarm later than according to the number of seconds indicated in the configuration. It is essential that the user should perform tests on his/her device before activating this feature.

Inactivity verification

It enables you to use the device out of its maximum inclination and the "Man-Down" alarm and the "Immobility Alarm" are activated only if the user has not touched the screen for the number of seconds set in the parameters of VerticalMan ("Inactivity period").

From version 4.18 the telephone communication is also checked as an activity, so as not to activate the alarms if the operator is phoning.

By activating this mode, it is presumed that when the operator uses the screen it is not a "Man-Down" or "Motionless Man" alarm situation.

This is the best mode if the device is not used exclusively for VerticalMan, compared with "Alarms on standby only".

Alarms on standby only

It enables using the device out of its maximum inclination and the "Man-Down" and "Motionless Man" alarms are activated only when the screen turns itself off after the time configured in the Android control panel.

Once this feature is activated, it is essential to verify that no apps are used which keep the device always active by never shifting it to stand-by because this would lead to the non-activation of the VerticalMan for the "Man-Down" or "Motionless Man" alarms.

The "VerticalMan" application also runs on non-recent Android mobile devices; however, given its nature of detecting dangerous situations, the use on personal mobile phones is strongly discouraged.

Aldea recommends installation on mobile telephones suitably configured to allow the <u>exclusive</u> execution of the "VerticalMan" application.

VerticalMan has only one screen and the user's choices are carried out by scrolling, therefore they are hardly accidental. Access to the secondary configuration and information screens has a timer which returns them to the main screen.

Access to the configuration of the application may be limited with a password (strongly recommended for all installations), to avoid that the operator of the device should inappropriately modify the execution parameters defined by the administrator.

You must not leave the files exported from the configuration as they contain clear-text passwords within them. It is the administrator's responsibility to delete the files after having saved them on another secure device.

It is possible to configure that the exit from the application should also require entering the administrator password.

In order to keep the system safe you can be notified both locally and remotely should the battery charge level fall below a configured percentage. In an area such as personal safety it is very important that the device's battery should be sufficiently charged when it is necessary to initiate remote alarm notifications.

VerticalMan allows to be notified **locally** if you enter an area where there is no connectivity (GSM or Wi-Fi) required for the selected remote notifications.

The application warns locally if the configuration is not consistent so as to avoid that notifications are correctly sent when needed. The verification of the configuration envisages, for example, that the remote notification channel should be carried out via text message and at least one destination telephone number be indicated.

Below there is a list of the methods to run VerticalMan from the safest to the least safe one.

Mode	Safety
Exclusive use on the device with SureLock protection	★★★★★
Exclusive use on the device	★★★★½
Non-exclusive use on the device	★★★★☆

The SureLock application, by 42 Gears Mobile Systems, allows to greatly limit the operability on the device making the system extremely safe as it has been specifically designed to perform the functions of the VerticalMan application alone.

14. Functions available on Atex eCom devices

Some specific functionalities provided by the manufacturers' firmware have been developed for the eCom Smart-Ex 01 and Smart-Ex 201 and Sonim XP7 devices:

1. The possibility to enable:
   a. Uninstalling the application
   b. Disabling the forced shutdown of the app
2. Restarting in case of a crash
3. Fall alarm
4. Red button associated with the SOS alarm

15. Activity log

Users who have access to the configuration can consult the log of the events which occurred in the last 30 days with the details of the alarms and notifications sent.

16. Multilingual mode

The "VerticalMan" application has a user interface in English and Italian.

17. Android Device Requirements

The minimum requirements that a mobile device must have in order to be used with VerticalMan are listed below.

Requirements	All installations	Wi-Fi notifications or IPS with Wi-Fi	IPS with Beacon	Outdoor positioning
Operating system	Android 4.4.4 – 9.0			
Display	2.6" res. 432x320		4" res. 480x800	
Sensors	Accelerometer (which does not deactivate on stand-by)			
Connectivity		Wi-Fi board	Bluetooth 4.0	
Positioning				GPS
Belt pack	vertical holder			

18. Recommended devices

VerticalMan can work on a wide range of mobile devices, from simple commercial smartphones to the most advanced devices designed for field work (rugged and Atex certified).

According to the operation of the lone worker you can choose the type of device on which to install VerticalMan.

Aldea recommends the following devices depending on the areas of operation.

Area	Atex	Industrial areas	Office
Description	Atex certified hazardous area	Industrial, field work	Ordinary work
Example of operator	• Maintenance worker • Industrial operator	• Maintenance worker • Industrial operator • Courier • Security • Farmer	• Office operator • Cleaner
Type of device	Atex	Rugged	Commercial Rugged-Lite
Recommended device	• eCom Smart Ex 012 • eCom Ex-Handy 010	• Unihetz Atom • Atesi E5 • Zebra TC20 • Zebra TC25	Samsung xCover 4

Download VerticalMan from following link:

https://www.aldea.it/download/VerticalMan/lastVersion/VerticalMan.apk

directly from smartphone or copy the APK file on the device via USB cable, alternatively send it by e-mail to the account configured on the smartphone. Must be enable installation from unknown sources.

All system permissions asked must be approved all because are essential for the correct operation of VerticalMan.

At its first start up, VerticalMan displays the configuration screen where at least one remote notification channel must be set to prevent the wrong configuration alarm from being activated.

Upgrading is possible in the same mode, but for security it is always best to back up the configuration before upgrading.

We do not recommend keeping the automatic update from the Google Play Store active if the equipment is used professionally. It is preferable that the administrator of the device should voluntarily launch the update to the new version available in order to monitor any anomalous behavior after its installation.

If there are multiple devices in the company with VerticalMan, **it is recommended to upgrade the App first on a single device** to verify that no unexpected operations occur for a couple of days and then update all the others.

Aldea invests a lot of time to test the new versions before release, but the countless models of devices on the market and the variety of possible configurations does not allow to verify the correct operation for all the cases.

Installation from corporate Play Store

To allow installation from corporate Play Store you can use the following APK with a different applicationId from the official VerticalMan published on Google Play Store:

https://www.aldea.it/download/VerticalMan/lastVersion/VerticalManPrivStoreRelease.apk

App upgrade

In the configuration with the "Check for updates" option, it is possible check out the availability directly on the Aldea website (not on Google Play Store) of new versions. Should a more recent version be available, the details of the changes are displayed and there is the option of immediate download and installation.

Depending on the type of Internet connection, the download may take several minutes; in the event that the installation does not start up independently at the end of the download it is possible to manually start the VerticalMan.Apk from the / VerticalMan / tmp directory.

Updates are not released as frequently on Google Play Store as on the Aldea website.

When installing other Apps, it is important to once again check the correct operation of VerticalMan; for example, should VM be set with the parameter "Alarms only in standby" active and an App which always keeps the device screen active be installed (de facto disabling the energy saving option), VerticalMan will never go into alarm mode, thus making the system unsafe.

20. System Configuration

Some firmware have settings that can interfere with VerticalMan, it is good to check in the manual of your device if there are, for example, settings that prevent the execution of the App when in standby.

Unihertz Atom specific configuration

To be done from the Android Control Panel

- Disable AppBlocker at least for VerticalMan
- Enable DuraSpeed for VerticalMan
- In case you use SOS alarm, in "Intelligent assistance" configure
    - "Shortcut settings" to start VerticalMan upon pressing the PTT button
    - Choose VerticalMan as an application both in Choose PPT App and in Smartkey (short press, Long press).

Specific configuration for Android 9 and later

- Enable DuraSpeed for VerticalMan

21. Configuration

First configuration

In order to use VerticalMan it is necessary that at the first start-up a minimum configuration should be carried out, which includes:

Definition of a unique device identifier: by default the value 1 is assigned, but it is necessary to personalise it to identify each VerticalMan within your company, especially if there are multiple installations of the application.

Defining a remote notification channel: Depending on the type of notification it is necessary to set the complementary parameters, e.g. should you choose the notification via phone call you must set at least one recipient of the call.

To verify that a coherent configuration has been made, the "Check configuration" option can be used in the configuration screen.

Exporting the configuration

VerticalMan is extremely configurable and can therefore be used in the widest spectrum of situations and according to customer requirements.

For a complete description of the configuration keys, refer to the specific document VerticalMan – Configuration manual.pdf. We strongly advise all administrators to read the Man-Down system in order to identify the best configuration for their operators to use.

Export throw file

It is possible to save the configuration from the device to the file system through the appropriate function (Configuration-> Export Configuration) of the App which generates the following files in the directory/Internal Memory/VerticalMan /:

VerticalManConfig.json	VerticalMan configuration file which can be used for imports
VerticalManConfig.csv	Valorisation of all CSV format keys for easy reading in Excel. It is a file useful **only** for consulting the keys, it has no associated features.

At the end of the export, VerticalMan will ask if you wish to send the file exported by e-mail to make it easier to save it on another system.

Warning: the json and csv files contain all the configuration keys including those with the passwords for remote services and for accessing local configuration.

We strongly recommend deleting the json and csv configuration files from the device after use.

Export throw QR Code

From the "Configuration-> Show the configuration QR code" option it is possible to represent the configuration in a QR Code that is framed by another device by activating the "Configuration-> Acquire the configuration from QR Code" partner function.

The acquisition phase requires the first time that the device download an Android component that allows the identification of QR Codes therefore at the first start may not be available the camera function necessary to frame the QR Code.

This type of export can only be used if the configuration is not particularly large, especially if you have several defined IPS areas, in which case the representation in QR Core warns of impossibility.

Export throw NFC

By contacting the back of two devices with VerticalMan, the NFC transmission of the configuration can be started. The transmitting device must be in the Settings function (for security reasons) and the receiver in the main screen of the VerticalMan. Once the NFC connection has been started, it is sufficient to tap on the transmitting device and the configuration is passed to the receiving one.

Importing the configuration from file

It is possible to import a configuration file in order to restore a previous situation or to facilitate changing the parameters.

The Configuration-> Configuration Import function imports the file located in /Internal Memory/VerticalMan/VerticalManConfig.json

Backup configuration on the Cloud

It is possible to copy the VerticalMan configuration to the Aldea Cloud for a simpler restore operation on the same device or on another.

Backup on the cloud requires an Internet connection and returns an ID backup that must be saved in order to proceed with the recovery procedure.

By using the backup on the Cloud, you accept that the configuration resides on the Aldea servers and that the system administrators have access to these configurations.

The backup files of the configurations on the Cloud are meant to be used for short periods also because they are deleted after a few months. It is suggested to make a backup via file for long-term storage.

Restore configuration from Cloud

It requires to insert the backup ID and restore the configuration previously saved with "Backup configuration on the Cloud".

Centralised configuration

In installations where there are several VerticalMan systems with data connectivity, it is possible to use the centralised configuration function which allows you to publish a configuration of VerticalMan on the central system which is automatically taken from the devices via web calls. This configuration mode is very useful for keeping all systems up to date with the same configuration so that the behaviour is uniform for all installations.

It is also possible to centrally set the specific configuration for a specific device in case this should need some special features compared with the others.

From VerticalMan it is also possible for the administrator to directly publish the device configuration on the centralised server.

The centralised configuration requires data connectivity (whether Wi-Fi or 3/4G), but is also available as part of the licence which only provides GSM notifications.

Aldea supplies the application EcoroLite for the centralised management of the Web configuration free of charge, at the client's request also on a fully configured virtual Linux server (Oracle VirtualBox).

22. Preliminary checks before use

Since some Android devices completely deactivate sensors during their stand-by status, it is necessary to perform the following steps to check out this eventuality:

1. Start VerticalMan already configured with at least one notification channel
2. Press the button that puts the phone into standby mode
3. Place the mobile phone on a horizontal surface

If after a few seconds the screen turns itself on and shows the pre-alarm countdown on the posture: the Android device works correctly and keeps the sensors active even during stand-by. In this case VerticalMan can be used saving on the battery of the device which can enter the stand-by mode without affecting the "Man-Down" detection.

On the other hand, should the screen remain turned off (stand-by) it means that the device's firmware disconnects the power supply to the sensors required by VerticalMan for its use. In this case it is still possible to use VerticalMan, but it is necessary to enable the "Always active" parameter in the configuration which reactivates the screen every time the device enters into stand-by mode, thereby greatly reducing the life of the device's batteries.

23. License activation

The purchase of the licence is provided with an activation code which must be entered into the application parameters to activate the licence. **At this stage the device must have access to Internet to reach the aldea.it website.**

Once the licence has been activated, the name of the holder and a numeric licence number will show in the information and configuration parameters screen.

The activation code is associated to the number of licences purchased, therefore you must use the same code to activate all the VerticalMan apps on the various devices.

Automatic license activation

If you have many licenses to activate, you can create a text file called Verticalman.license.json to be copied to the main directory of the smartphone, with inside:

```
{
"activationCode": "xxxxxxxxxxx",
"action": "activation"
}
```

Replace your activation code and the "activation" or "deactivation" in action key.

When VerticalMan starts, the file is read and the activation or deactivation of the license is performed by connecting to aldea.it; if the action is successful, the file is automatically deleted.

24. License deactivation

If you want to move the license to another device or reinstall it after a factory reset, you must first deactivate the license with the same activation procedure, i.e. by selecting Deactivate in the License section of the configuration and entering the activation code with internet connection available.

ATTENTION: Before uninstalling VerticalMan it is necessary to deactivate the license from the configuration.

25. Check system status from remote

It is possible to activate from the configuration (Advanced-> Remote consultation system status) the system status via SMS query. With this function it will be possible to send an SMS with the text:

> VMS;

VerticalMan will reply with an SMS containing the information of the system status:

> VerticalMan v.4.4 b4835
> Device Id:1
> Stato:Pause(19 feb 16:48)
> Internal battery:52%(Charging)
> GSM:5/5 in 3G
> GPS:19 feb 16:47 20mt
> WiFi:4/5

The state can assume the values: Running, Pause or Alarm.

For GSM and WiFi, signal quality is provided on a basis of 5 enhancements. 5/5 means maximum signal.

GPS Reports the time of the last position and accuracy in meters.

There is no information regarding the location of the device to preserve the privacy of the worker.

If the query to be carried out by an IT system, it is possible to request a technical answer using the text:

> VMS;TECH

That will replay the information separated by semicolons according to the following format:

> SS;DeviceId;Timestamp;Status;InternalBatteryLevel;isIntenalBatteryCharging;GSM_strength;isGPS_available;GPS_timestamp;GPS_accurancy;WiFi_strength;networktype

If the Web notification is active, it is also possible to activate the periodic transmission (1-60 min) of the system status, via the web via the configuration (Notifications Remote-> Web-> Send status VerticalMan via web)

26. Technical support
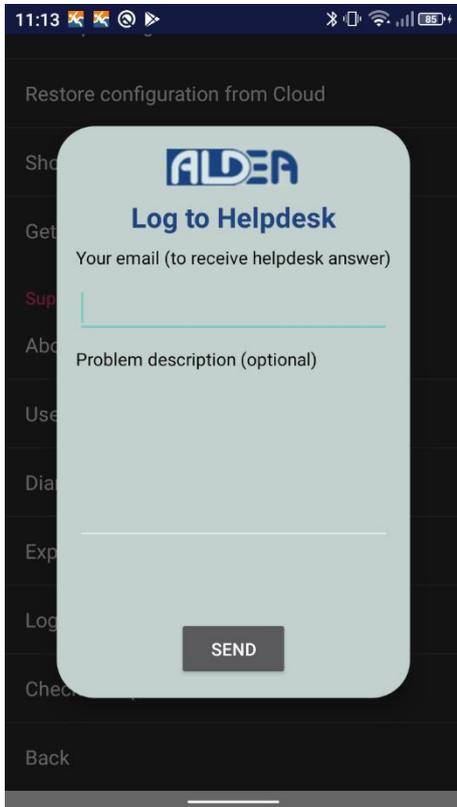
All customers who have an active maintenance service can request Aldea's technical support.

To facilitate communication in the event of an error, it is possible to use the function "Log a Helpdesk" in VerticalMan configuration which send the log files and the configuration to the Aldea cloud.

It is necessary to enter an e-mail address in order to receive answers from technical support and possibly a description of the anomaly found.

Once sent is completed, an identification (Cloud Id) is returned to the operator which identifies the saving of the configuration and log and Aldea technical support is notified of the request.

If the device is not connected or connectable to the Internet, at least the log file /VerticalMan/log/Aldea VerticalMan.log must be sent to technical support by downloading it from the smartphone to a desktop/laptop via a USB cable.

In case in the folder <Internal memory>/Download exists files with the name begins with Crash_it_aldea it is necessary to send also those.

27. Video Tutorial

On our YouTube channel there are same video for installation and configuration instructions

Installation		SureLock Configuration
https://youtu.be/6GfUc3fpKCg		https://youtu.be/mNooIlKjb3s
Configuration		External sensor
https://youtu.be/poBQPupMGC8		https://youtu.be/9b5Q82zhFUM

28. FAQ and Release Notes

See the link https://www.aldea.it/en/verticalman-faq/ to read the up-to-date frequent questions and answers on VerticalMan

For all news in VerticalMan App please visit :
https://www.aldea.it/ecorolite/appReleaseNotes?lang=en&appName=VerticalMan

29. Limitations of the solution

The following are the main limitations which the system must comply with:

- The system can only be used if the worker's duties include an upright posture (standing or sitting).

- It is compulsory for the user to keep the mobile device with VerticalMan active and in its special case on his belt; or, for configurations with an external sensor, to have the latter on the belt.

- It is necessary that the radio signal coverage (GSM or Wi-Fi) chosen for the alarm notifications should also be good on the ground of the area in which the worker operates.

- It is necessary to choose a notification channel for a rescuer who is within reason as available as possible in the event of an alarm. E.g. Should a GSM call be selected for the alarm notification channel and the recipient often be unreachable, the system has an intrinsic fault.

- In the case of alarm notification via text message or GSM call, the SIM must be active and with sufficient credit to carry out the requested operations.

- If VerticalMan has to operate in flooded or easily flooded premises, a suitable waterproof case or a waterproof device must be provided (rugged).