The Smart Solutions Company

VerticalMan®

Lone worker safety App for Android devices

The complete guide

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Summary

1. Introduction 4
2. Law requirements 4
3. Who needs it 5
4. What is offered by VerticalMan 5
5. VerticalMan features 6
   5.1 Alarm pause 7
   5.2 GPS positioning 7
   5.3 Panic Button 8
6. Particular features 9
   6.1. Notification via Wi-Fi network 9
   6.2. IPS (Indoor Position System) – Indoor positioning with Beacons 10
   6.3. IPS with Wi-Fi 11
   6.4. Hybrid IPS - Wi-Fi Beacon 11
7. Alarms 12
   7.1. Alarm - Man Down 12
   7.2. Alarm Motionless or Immobility 12
   7.3. Alarm SOS 12
   7.4. Alarm Panic Button 13
   7.5. sAlarm Toxic gas 13
   7.6. Alarm Low Battery 14
   7.7. Wrong configuration 14
   7.8. Unavailable connectivity 14
   7.9. GPS signal absent 14

7.10. Impact alarm 14
7.11. Vehicle Accident Alarm (beta) 14
7.12. Social distancing alarm 14
7.13. Old position alarm 15
7.14. Alarm priority 15
7.15. Heartbeat out of range alarm 16
7.16. Watch disconnected alarm 16
7.17. Alarm deactivation when charging 16
8. Channels for remote alarm notification 17
8.1. Alarm call Movicon SCADA system 18
8.2. Web page retrieval 18
8.3. GSM telephone call 18
8.4. Sending a text message (SMS) 19
8.5. Email message 20
8.6. VoIP call 20
8.7. SMS from Web 21
8.8. SMS from SMS Gateway 21
8.9. PTT call 22
8.10. Telegram Message 22
8.11. Microsoft Teams Message 24
9. Operator with Enabled Remote Notification Recipient Modification 25
10. Integration with centralized alarm management systems 25
11. Use with external sensor 26
12. Use with a Smartwatch 31
13. Non-exclusive operations 31
13.1. Inactivity verification 31
13.2. Alarms on standby only 33
14. Safety 34
15. Functions available on Atex eCom devices 35
16. Activity log 35
17. Multilingual interface 35
18. Android Device Requirements 36
19. Recommended devices 36
20. App installation 37
20.1. Installation from corporate Play Store 37
20.2. App upgrade 38
20.3. Update on installations with SureLock 38

21. System Configuration 38
21.1. Unihertz Atom specific configuration 39
21.2. Specific configuration for Android 9 and later 40
21.3. Specific configuration for eCom SmartEx-02 41
21.4. Specific configuration for Ruggear mobile smartphone 41
21.5. Specific configuration for iSafe mobile smartphone 41
iSafe IS360.2 41
iSafe IS440 42
iSafe IS530 and IS540 42
22. Configuration 43
22.1. First configuration 43
22.2. Exporting the configuration 43
22.3. Importing the configuration from file 44
22.4. Backup configuration on the Cloud 44
22.5. Restore configuration from Cloud 44
22.6. Centralised configuration 45
23. Preliminary checks before use 45
24. License activation 46
Automatic license activation 46
25. License deactivation 46
26. Check system status from remote 47
Periodic sending of system status 47
27. Technical support 48
28. Video Tutorial 48
29. FAQ and Release Notes 49
30. Limitations of the solution 49

1. Introduction

The application “VerticalMan” helps prevent the dangerous “Man down” situation.

The “Man down” feature allows monitoring the worker’s posture (it measures the angle between the worker and the floor). If this angle remains sharper than a preset value for a certain period, VerticalMan alerts both locally (with visual and acoustic alarms) and remotely (through web service, phone call, email, VoIP call, or SMS).

This system is primarily intended for lone workers who do not have a working partner nearby or continuous direct contact with other people.

2. Law requirements

Many countries have specific laws to take care of lone workers.

For example:

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

3. Who needs it

All workers who carry out activities alone.

Below is a partial list of lone workers categories:

- 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 is offered by VerticalMan

VerticalMan is an application installed on an Android device, it allows to monitor the vertical posture of a lone worker who can work both outdoors and indoors.

If the worker remains in “horizontal” status (parallel to the floor) for a certain period of time, VerticalMan warns the rescuer. You can set the way it is done between: GSM phone call, email, VoIP call, SMS or web call to a company alarm management system. All this alarm notification channels can be turned on at the same time.

The solution VerticalMan is composed also by these 4 components:

- eCoRo Web: for the centralized alarm management
- eCoRo Web Lite: for only the centralized configuration management
- eCoRo App: to receive the SMS alarms
- the AWSI form: to interface with centralized SCADA systems

5. VerticalMan features

"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	✓
Altered heartbeat 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; WhatsApp)	✓
Alarm noticed through PTT (PushToTalk) call	✓
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	✓
Use of an external sensor	✓
Use of a Smartwatch	✓
User interface language	Italian English

5.1 Alarm pause

In the App settings the administrator is able to add the “alarm pause” button. This feature allows the worker to suspend alarms for a specified number of minutes; it is useful when the worker has to do particular activities in which his position would otherwise trigger alarms.

The Pause, suspends all alarms, but in configuration the administrator can left Immobility alarm active.

5.2 GPS positioning

You can configure the acquisition of the GPS position in two ways:

The first method uses the system offered by Android, which establishes the location choosing the best option between those offered by the satellite, by the GSM operator, by the Wi-Fi connection or by the Bluetooth connection. This method is suggested by Google because it allows to have a higher accuracy and savings on the use of batteries.

Alternatively, VerticalMan allows you to take the GPS positioning only from the satellite. We added this option because in some areas and for some GSM operators, using the first method could be not very accurate. Furthermore taking the GPS position only from the satellite is mandatory if you are using an indoor positioning system (IPS) with beacons, in this way you can prevent errors in the position offered by the GSM operator (because it allows the receiving also indoors but with possible localization mistakes up to some hundreds of meters).

5.3 Panic Button

You can associate a Panic Button to VerticalMan; the worker could use it in dangerous situations without the need to log into VerticalMan which however must be in the user's neighborhood.

Panic Buttons are connected to VerticalMan through Bluetooth link.

The Panic Button could be configured in two ways: it could start the classical SOS alarm that warns first locally and then with the remote notification, or it could be set as a Silent Alarm that warns only remotely. This second option in suggested especially in situations when not giving evidence that the alarm has been triggered is crucial (for example aggression or theft attempt).

For the Panic Button alarm, notifications with voice calls are disabled, then GSM, VoIP or PTT phone calls.

If you want to add a Panic Button you just have to go to VerticalMan settings, turn it on and chose the Panic Button among those available.It's possible to associate more the one Panic Button to the same VerticalMan.

At the moment Flic Bluetooth Buttons are supported.

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

Frequent testing of the operation of the Panic button is recommended to avoid encountering problems when needing to use it.

Unfortunately, the Bluetooth pairing of the Panic Button must be done on the device, i.e. it is not possible with the only VM configuration (perhaps taken from the web) to associate a panic button.

how to configure Flic Button as a Panic Button

1. Go to VerticalMan's configuration
2. Turn on the "Advanced->Panic Button"
3. Click on "Select Panic Button" and hold the Flic button until it join to VerticalMan.
4. Indicate in "PanicAlarm" what type of alarm you want to be turned on when the Flic button is pressed: SOS or Silent (if you choose silent remember to turn off the sound also in the app Flic 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)

After the initial pairing, it is necessary to restart the smartphone to apply the configuration.

6. Particular features

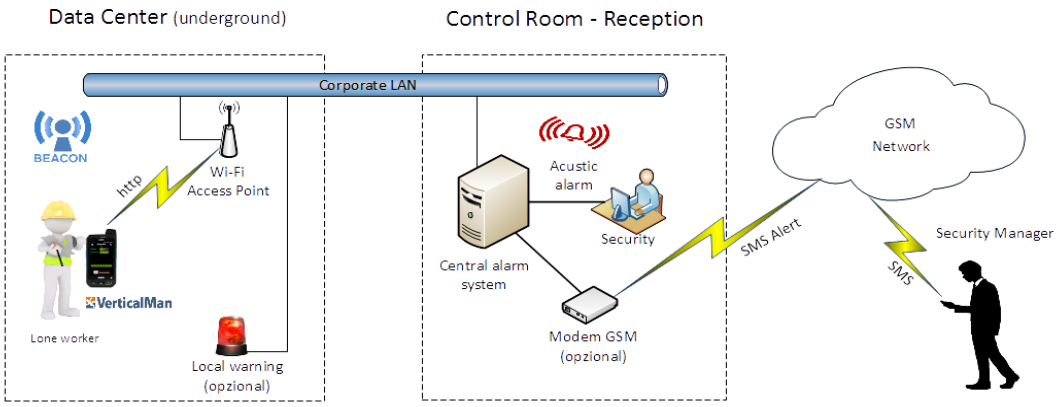
6.1. Notification via Wi-Fi network

Compared to the competition, VerticalMan's distinctive trait is surely that you can notify the alarm through Wi-Fi connectivity, being 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 availability of the service offered by thirds parts (GSM operator) in case of emergency
- Do not need a GSM SIM that must be managed also administratively to maintain it active
- Monitor the functioning of your own network devices that contribute to make the entire system extremely secure

VerticalMan indoor scenario



6.2. IPS (Indoor Position System) – Indoor positioning with Beacons

Only the GPS positioning is not enough if the lone worker operates also in indoor areas where the signal from satellites 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 his 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 VerticalMan's configuration in the section: Position -> 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:

Section	Characters
First	8
Second	4
Third	4
Fourth	4
Fivth	12

    -
    - 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 outdoors, where the GPS signal is available, and indoors, where there is a beacon network, you can indicate in the notification SMS only one of the two positions. The IPS position has always the priority and when it is not available, 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 further details please view the “variable fields” chapter of the Configuration Manual for “GoogleMapOrIPS”.

Most of the common commercial beacons are supported, including 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.

6.3. IPS with Wi-Fi

If VerticalMan operates always under Wi-Fi connectivity coverage, you can 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 compared to the beacon network, but in some situations could be easy to implement without additional costs. In the configuration you can define an area name for every BSSID.

If VerticalMan operates both outdoors and indoors, you can indicate in the notification SMS only the most recent position through the variable field “GoogleMapOrWiFi”. This indicates the area name if under Wi-Fi coverage, otherwise the GPS coordinates with the Google map link.

It is not mandatory for the smartphone to be connected to the Wi-Fi network used for positioning. It is possible to define whether the positioning Wi-Fi network must be the one the device is connected to or simply the closest one (i.e., with the strongest RSSI signal).

Additionally, it is possible to set a minimum RSSI (signal strength) value for a network to be considered acceptable for positioning.

6.4. Hybrid IPS - Wi-Fi Beacon

You can activate indoor positioning with beacon and Wi-Fi at the same time. 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 Man Down and Wrong Configuration alarms, all the others can be deactivated in the configuration.

7.1. Alarm - Man Down

VerticalMan constantly monitors the angle between the device and the floor, the man down alarm is activated when this angle is more acute than a preset value for a determined number of seconds.

First of all only a local alarm (visual and acoustic) is activated for a configured amount of seconds. If the worker does not stop the local alarm before time runs out, remote notifications are activated using the configured communication channels.

7.2. Alarm Motionless or Immobility

The motionless alarm starts if the user remains motionless for a configured number of seconds. Also in this case the local alarm is activated first and then the remote notifications.

To block the motionless alarm it is necessary to press the button that stops the alarms.

If the "Stop alarm with movement" parameter is activated, it will not be possible to predict the vibration when alarms are triggered because this would conflict with the indication to stop the alarm with movement.

For some devices (ex. Unihertz Atom) you need to turn on the "Screen always on" parameter in order for this alarm to work even when in stand-by mode.

7.3. Alarm SOS

This alarm is turned on when the user presses voluntarily the “SOS” button of the application. 5 seconds are given to the user to undo this operation before the start of the remote notification.

In 5 seconds, the GPS position could be not updated, so you can configure a second notification that starts at least after 2 minutes the first one.

This double notification is active only for Web reports or for SMS and emails that contain the GPS position.

Some devices have programmable physical buttons, you can associate them to the SOS alarm. Supported devices are indicated in the configuration documentation (SOS keycodes parameter).

7.4. Alarm Panic Button

You can configure an external Panic Button and connect it to the device with VerticalMan through Bluetooth. When the button is pressed, it activates the remote notification of a silent alarm or the SOS alarm with local acoustic alarm.

7.5. sAlarm Toxic gas

With the help of a portable gas detector connected via Bluetooth to the smartphone with VerticalMan, there will be the whole local and remote alarming component that increases the safety of both the worker in the dangerous situation and its rescuers, who can arrive prepared according to of the gas whose limits has been found.

Currently the support gas detector is the Riken Keiki GX-3R Pro, which allows the survey of up to 5 contemporary gases between:

- H2S (sulphide acid or hydrogen sulphide)
- Co (carbon monoxide or carbon asside)
- SO2 (sulfur dioxide or dioxide/dioxide of sulfur)
- CO2 (carbon carbon dioxide or dioxide)
- O2 (oxygen) deficiency

The gas detector can also be considered as a mandatory accessory that VerticalMan controls is always connected with the smartphone; If it is not for more than 2 minutes, an accessory alarm is raised not available.

If, on the other hand, the gas detector is not mandatory, its connection is only shown on the status bar by an icon represented a flame. It may take a few seconds before the gas detector is completely associated with VerticalMan.

If the alarm for low battery is active in VerticalMan, it is reported on VerticalMan even if the gas detector reports download battery, without however considering the minimum battery level for external accessories.

To enable the gas alarm, it is sufficient in configuration selecting the gas detector from the list of those nearby, while all the configuration relating to the gas parameters is issued to the detector itself.

7.6. 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.

If the mobile application is not running and there are low-battery alarm conditions, a communication is sent to the central system only if the notification is via Web.

7.7. Wrong configuration

The alarm is triggered if one of the following conditions occurs:

1. The device identifier has not been defined
2. Remote alarm channel notification has not been chosen
3. If the selected remote notifications have not the corresponding parameters filled out. (Ex. if you chose web notification, the URL call sign must also be filled out)

7.8. Unavailable connectivity

If the remote web notification has been chosen, the Wi-Fi connectivity is always checked for availability. The alarm is triggered if the Wi-Fi signal is not available.

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

7.9. GPS signal absent

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

7.10. Impact alarm

This alarm is raised if the device has an acceleration beyond a certain threshold.

7.11. Vehicle Accident Alarm (beta)

This alarm is raised if the device is on a moving vehicle and the acceleration is greater than 15g. So far this alarm is provided only in beta mode due to difficulties in practical testing.

7.12. Social distancing alarm

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

You can 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 tracked.

7.13. 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.

7.14. Alarm priority

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

Following the alarms priority:

Alarm	Priority	Primary	Persistent
Man Down	2	Yes	
Motionless	2	Yes	
SOS	1	Yes	
Panic Button	1	Yes	
Low Battery	3		Yes
Wrong configuration	3	Yes	
Unavailable Connectivity	3		Yes
GPS signal absent	3		Yes
Impact	2	Yes	
Vehicle accident	2	Yes	
Social distancing	2		
Old position	3		
Heartbeat out of range alarm	2		
Watch disconnected	2		
Mandatory accessory	3	Yes	

7.15. Heartbeat out of range alarm

VerticalMan allow to check heartbeat into an interval, with two accessories: a SmartWatch or a Heart Rate monitor. In both case, it is not checked the cardiovascular arrest.

The heartbeat is never communicate or saved in log if there isn't an relative alarm.

7.16. Watch disconnected alarm

It is raised if the Watch associated with VerticalMan is not connected and one of the following alarms has been activated on the Watch:

- Immobility
- Heartbeat

While if the Watch is used only to stop alarms or to activate the SOS alarm, disconnecting the Watch does not raise this type of alarm because it considers the Watch as an optional and not mandatory accessory.

7.17. Alarm deactivation when charging

You can disable the alarms when the device on which VerticalMan is running is charging its battery. This allows you to have 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 lone worker performs his duties, as the system would be totally unsafe while the device is charging.

If SMS/Web notifications are configured for app entry and exit, when the device is put on charge it will be notified as if the app were closed, while when disconnected from charging it will be notified as if the app were opened.

8. 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 network	6	SMS from Web	Allow to send SMS with only Wi-Fi connectivity
Wi-Fi network	6	SMS from SMS Gateway	Allow to send SMS with only Wi-Fi connectivity
Wi-Fi network	7	PTT call	Start PTT (PushToTalk) call

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

8.1. Alarm call 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.

8.2. 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. You must install on the server a software allowing management of the correct alarm notification procedures according to the defined VerticalMan's application protocol.

By default, Web calls are made in POST mode, while if you want GET mode you need to indicate the GET: prefix in the url parameter.

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"

Is possible to configure additional urls that VerticalMan call with the same credential and parameters of the main url. This is useful for backup call to alternative web server or to control more the one external siren.

If the web calls are not successful, they are automatically repeated up to 5 times with intervals of a few hundred milliseconds. If these retries are also unsuccessful, sending is retried every minute for one hour after the alarm signal. This is to handle the case where the data connection is intermittently present at the scene of the accident.

8.3. 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 speak. The phone number of the mobile device with the VerticalMan application will be stored in the rescuer's phone book under an appropriate name.

You can configure up to 5 telephone numbers which will be called in sequence if the alarm situation persists. You can configure that when a call is answered, this system will not continue with the subsequent calls. Pay attention on activating this parameter if there are telephone numbers in the chain with voicemail or an automatic answering machine.

Since Android 9, at the start of the phone call, the communication can be recorded locally in an mp4 file for an in-depth investigation in case of need.

From Android 10, calls made with the system's phone app do not start in hands-free due to the limitations introduced by Google; On these systems it is necessary to install Aldea Nano Phone and make it the default phone App, so the calls started by VerticalMan have the hands free active.

Starting with Android 15, it is necessary to authorize Aldea Nano Phone for "Allow restricted settings" by going to Android Settings → Apps → Nano Phone → Permission → Menu (three dots) → "Allow restricted settings."

Without this authorization, Nano Phone cannot be set as the default app, and it will not be possible to initiate phone calls from VerticalMan in speakerphone mode.

8.4. Sending a text message (SMS)

Up to 5 text messages requesting help are sent, with a completely configurable text. The GPS coordinates should 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 you can specify in the fifth recipient the phone numbers of multiple recipients (separated by semicolons) of the messages but all formatted with the fifth model.

In the configuration you can enable the notification of start and exit from the application via text message. When the device is turned off, VerticalMan attempts to send the exit notification SMS but it depends on the Android version if the messages have time to leave.

As the reception of a text message to the rescuer is usually notified with a single acoustic signal, Aldea has created eCoRo App in order to provide the possibility to receive multiple acoustic signals for 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 you must 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.

8.5. 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 emails 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).

8.6. VoIP call

One single VoIP call is started to the configured recipient.

You can set SIP; Skype; WhatsApp; or Customized calls.

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

For example if you choose WhatsApp 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 WhatsApp it is possible to indicate the complete name of the contact or the phone number (with or without international prefix).

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 contact name or phone number
Custom	?	?	?	?	✗	URI completed with protocol

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

The question mark 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.

8.7. 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
- ArubaSMS

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

8.8. SMS from SMS Gateway

VerticalMan is able to send SMS by controlling an SMS Gateway installed on the same LAN network.

The function is particularly useful when you have to use the WiFi network because the GSM signal is not present in areas where lone workers work but you still want to send SMS to the rescuers.

SMS Gateways are currently supported:

- HW Group SMS-GW3
- HW Group SMS-GW3 LTE

For the configuration it is sufficient to indicate the IP address of the SMS Gateway eg. http://192.168.0.66 and settings. If desired, it is possible to request that after sending the SMS also make a call to the same, it is destined to attract the attention of the rescuer more.

The SMS Gateway only offers support for the http protocol, but access and use can be restricted by setting a username and password. If you want to set a mandatory https protocol it is necessary that the network administrators implement a network proxy as for example with the stunnel tool.

In addition to being able to define multi-recipients by separating them with a semicolon, it is possible to enable the sending of SMS via Gateway for the same recipients, with the same template, as those sent for classic SMS on the GSM network.

The use of an SMS Gateway is particularly safe, compared to a GSM modem placed on the LAN network, because it does not have remote access functions nor does it offer data connection to the GSM network.

8.9. PTT call

VerticalMan is integrated with the PTT (PushToTalk) and PoC (PTT Over Cellular) system of TASSTA, therefore it is possible to initiate an emergency call to the group responsible for managing it, in case of VerticalMan alarms.

The PTT100 App must be installed and configured in order to make PTT calls.

The call takes place directly hands-free without the need for the operator to hold down the PTT button.

For the first 3 minutes of communication, the volume and vibration of the alarm are interrupted to allow to communicate with the operator. At the end of this period, the communication remains active but the local alarm resumes at the volume configured to allow the rescuers to locate the victim.

8.10. Telegram Message

VerticalMan is able to send a message to a Telegram group.
To use this communication method, the following settings are required:

Configure the Bot Token

What is the Bot Token?
It is a unique authentication token that identifies your Telegram bot and allows you to use the Telegram APIs to send messages.
Its format is:
123456789:ABCdefGHIjklMNOpqrsTUVwxyz-1234567890

How to obtain it

Step 1: Create the bot using BotFather

1. Open Telegram and search for **@BotFather** (the official Telegram bot for creating other bots)
2. Start the conversation with **/start**
3. Type the command **/newbot**
4. BotFather will ask you:
    - Bot name (visible to users): e.g., *"VerticalMan Alarms"*
    - Bot username (must end with "bot"): e.g., *"VerticalManAlarms_bot"*

Step 2: Retrieve the token
BotFather will respond with a message like:

Done! Congratulations on your new bot. You will find it at t.me/VerticalManAlarms_bot

Use this token to access the HTTP API:
123456789:ABCdefGHIjklMNOpqrsTUVwxyz-1234567890

Keep your token secure and store it safely, it can be used by anyone to control your bot.

That long alphanumeric code is the **Bot Token** you must enter in VerticalMan's configuration.

IMPORTANT: This token is like a password — anyone who has it can control the bot!

Configure the Chat ID

What is the Chat ID?
It is a unique numeric identifier of the group or chat where the bot should send alarm messages.
Formats:
• Private chat with a user: **123456789** (positive number)
• Group/supergroup: **-123456789** (negative number)
• Channel: **-100123456789** (long negative number)

How to obtain it

Using @userinfobot

1. Add the bot you created to the group where you want to receive alarms
2. Search for **@userinfobot** on Telegram
3. Add **@userinfobot** to the same group
4. @userinfobot will automatically send a message with the group information, including the Chat ID

Example of message:

Chat

Id: -987654321

Type: supergroup

Title: Plant Safety Alarms

The number **-987654321** is your **Chat ID**, which must be entered in VerticalMan's configuration.

8.11. Microsoft Teams Message

VerticalMan is able to send a message to a Microsoft Teams channel.
To use this communication method, the following configurations are required.

Create a Webhook in Microsoft Teams

Prerequisites
• You must be the team owner or have permissions to manage connectors on the channel

Procedure to create the webhook

a. Access the Teams channel
• Open Microsoft Teams
• Go to the channel where you want to create the webhook

b. Configure the connector
• Click on the three dots **…** next to the channel name
• Select **Connectors** (or **Manage channel → Connectors**)
• Search for **Incoming Webhook** in the list of available connectors
• Click **Configure** (or **Add** if it is not yet enabled)

c. Configure the webhook
• Enter a name for the webhook (e.g., *"VerticalMan Alarms"*)
• Optional: upload a custom image
• Click **Create**

d. Copy the webhook URL
Teams will generate a unique URL similar to:
https://outlook.office.com/webhook/[GUID]/IncomingWebhook/[TOKEN]

This URL must be entered in the VerticalMan configuration as: **"Teams channel webhook URL"**.

9. Operator with Enabled Remote Notification Recipient Modification

It is possible to allow operators to modify SMS and GSM call recipients by enabling this feature in the configuration settings.

This function is very useful when field operators need to select recipients from a contact list without granting them access to the app's configuration features.

In the definition of remote notifications for SMS and GSM calls, there is a parameter called "Allow Operator to Modify."

You can also enable the modification of the local contact list so that operators can define new recipients, not just select from those already configured.

In the configuration settings, it is possible to specify whether the local contact list can be modified by operators.

The local contact list is used only on the device and is not shared with other systems. It is used to facilitate the simplified management of recipient changes for operators or to display the associated name in the configuration view.

10. Integration with centralized alarm management systems

VerticalMan also allows notifying its alarms to SCADA systems through the additional eCoRo Web 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

MetaMotion sensor

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.

MetaWear MetaMotions sensor features

Feature	Description
Man Down alarm	The sensor independently detects the inclination and if it is maintained for a configured number of seconds, it raises the alarm in VerticalMan. The inclination angle and the yellow countdown are displayed in real-time. To detect the Man Down situation, the external sensor can be worn only on the belt or around the neck, but not on the wrist.
Motionless alarm	It independently checks if the sensor remains immobile for a configured number of seconds. A notification is given of the yellow countdown situation.
Low battery alarm	Activatable from the VerticalMan configuration with a specific battery level limit for the external sensor compared to the level for the smartphone.

If the immobility alarm is activated, remember to activate the parameter "blocks alarm with movement" otherwise as soon as the immobility is found, the yellow countdown starts and without the possibility of stopping the count. In this case it will be possible to stop the alarm only once the red countdown is started.

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").

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

Emerit Sensor

The Emerit e-B10 sensor allows for some additional functionality while having reduced battery consumption.

It can be worn, using the cases provided in the package, on the belt, wrist, and neck.

Emerit sensor features

Feature	Description
Man Down alarm	The sensor independently detects the inclination and if maintained for a configured number of seconds, raises the alarm in VerticalMan without displaying the inclination angle or the yellow countdown typically used with the internal smartphone sensor. To detect the Man Down situation, the external sensor can only be worn on the belt or around the neck, but not on the wrist.
Motionless alarm	It independently checks if the sensor remains immobile for a configured number of seconds. There is no notification of the yellow countdown situation.
SOS Alarm	The entire sensor essentially functions as a button that, if held down for a few seconds, triggers the SOS alarm on VerticalMan.
Panic Button	If you perform a double tap on the front surface of the sensor, a silent alarm is triggered. The Panic Button function must be enabled in Advanced->Panic Button.
Low Battery alarm	Activatable from the VerticalMan configuration with a specific battery level limit for the external sensor compared to the smartphone.
Reset allarmi	If VerticalMan is in alarm mode not triggered by the external sensor, it can be reset by pressing the sensor button three times consecutively.

With the Emerit e-B10 sensor, the real-time inclination angle and the yellow countdown are not displayed; this behavior allows the external sensor to consume less energy and extend battery life.

Please note that the Emerit e-B10 sensor cannot be used while charging.

In thi video https://youtu.be/_R-V5h9yqMU, how configure e-B10 sensor in VerticalMan.

Keep in mind that the external sensor is linked to a VerticalMan; therefore, if you have the configuration on the cloud, once it is paired, it must be published to the cloud.

A sensor can also be paired with multiple VerticalMan devices, but only one can use it at a time.

When the e-B10 is worn using the belt holster, the offset must be set to 1, whereas when worn around the neck, the offset should be set to 0. When worn on the wrist, there is no need to set the offset because the Man Down alarm cannot be used — only the Immobility alarm is available. We do not recommend using it on the wrist, as with only the Immobility alarm enabled, false alarms can occur frequently

In this video https://youtube.com/shorts/fK2Yo4XKwa0?feature=share, you can see how to turn the e-B10 sensor on and off.

mode	Led color	Pattern
battery good, BLE discoverable	blue	two short blinks accompanied by two short vibrations at the same time.
Reconnection mode	blue and red	alternating flashing between red and blue and two consecutive vibrations.
battery low, BLE discoverable	red	two short blinks accompanied by two short vibrations at the same time.
battery good, BLE connected	blue	blink once every 5 seconds.
battery low, BLE connected	red	blink once every 5 seconds.
pre-alert	red	blink and vibrate once every second.
alert	red	static red light with no vibrations.
post alert	red	blink and vibrate once every 3 seconds.
charger plugged	none (green)	no change in ble and red led behavior, only a single medium length vibration. green led turns on and then turns off when charging is finished.
update	blue	quick non stopping led blinks with no vibrations.
shutdown menu	blue	static led on, no vibrations.
shutdown notification	blue	three short blinks then one long, all accompanied by vibrations.
fatal error state	red	red static light, with one long vibration every 3 seconds.
Update failure	red	only occurs after an update restart, red static light with one long vibration every 3 seconds, three vibrations then the device shuts down and can only be restarted manually after 30-60 seconds.

Figura 1 - e-B10 sensor led color

The sensor on the wrist

If you want to control only the worker's immobility he could wear the Metemotions sensor on the wrist with the special strap.

But in this way, you cannot control the Man Down situation.

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.

Icon	Status
	Searching sensor
	External sensor connected. By pressing the icon, information about the sensor and its battery is displayed.
	Sensor not connettect. By pressing the icon, a manual reconnection will be attempted; otherwise, VerticalMan will try to reconnect every minute

If VerticalMan fails to connect to the external sensor, or if the sensor is disconnected due to being out of range from the smartphone or shutting down because of a dead battery, an **External Sensor Not Available** alarm is raised.

Operators who want to use the smartphone's internal sensor instead of the external one must press the sensor icon and select **"Use Internal."**

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.

When using the external sensor, inactivity monitoring is not taken into account.

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

12. Use with a Smartwatch

VerticalMan may have associated a smartwatch with the VerticalManWatch App, which reports the status of the alarms with the possibility of interrupting them; in addition, the following features are available:

- Immobility alarm controlled with the Smartwatch accelerometer
- Out-of-range heartbeat alarm
- SOS alarm

The smartwatch configurations are in the VerticalMan App in the Advanced-> Smartwatch section

If the smartwatch has activated one of the alarms detected through the sensors inside and is disconnected from the smartphone with VerticalMan, this raises the “Watch disconnected” alarm. While if the smartwatch is used only to activate the SOS alarm or to interrupt those initiated by the smartphone, the presence check of the smartwatch is not performed.

If the low battery alarm is active for the VerticalMan device, the charge level of the smartwatch is also checked and, if necessary, the low battery alarm of the external device is raised.

13. 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 only in Standby" 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.

13.1. 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 or is not in phone communication for the number of seconds set in the parameters of VerticalMan ("Inactivity period").

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".

To use the inactivity control, it is essential to set the type of screen lock to "None" in the Android configuration.

13.2. 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.

14. Safety

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 exclusive 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	
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.

15. 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

16. 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.

17. Multilingual interface

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

18. 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 – 13			
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			

19. 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	Rugged
Recommended device	• iSafe 530/540 • Bartec PixAvi/SP9	• Unihetz Atom • Athesi E5 • Zebra TC20 • Zebra TC25 • Crosscall CORE-M5 • Cyrus CM17 XA • Ruggear RG360	• Samsung xCover Pro • Handheld Nautiz X2 • Cyrus CS22 XA • Ruggear RG725

20. App installation

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.

20.1. 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

If you need an APK with an additional applicationId, contact technical support.

Especially for corporate Play Store installations, it is mandatory to disable the request for the installation privilege from unknown sources via the Advanced->Allow App update from Aldea option.

20.2. 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.

20.3. Update on installations with SureLock

You must exit SureLock before updating the Aldea Apps.
This video shows the steps to follow: https://youtu.be/kYNuMV84jRU

21. System Configuration

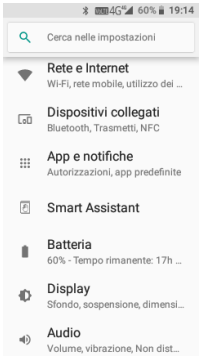
In order to use the do not disturb function in the event of activity on the smartphone (inactivity control), the screen lock type must be set to "None" in the Android configuration.i

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.

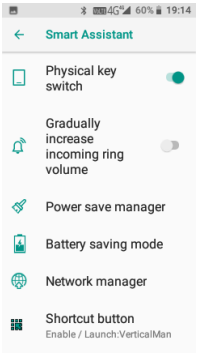
21.1. Unihertz Atom specific configuration

To be done from the Android Control Panel

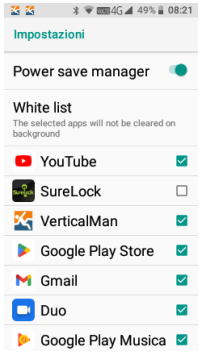
- Disable AppBlocker at least for VerticalMan
- Enable DuraSpeed for VerticalMan
- In case you use SOS alarm, in "Intelligent assistance" configure
  - "Shortcut settings" to start VerticalMan upon pressing the PTT button
  - Choose VerticalMan as an application both in Choose PPT App and in Smartkey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



Tap Smart Assistant



Tap Power save manager

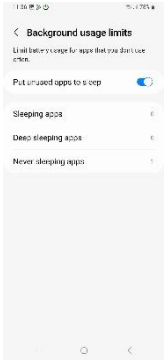


Select VerticalMan

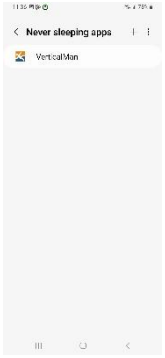
21.2. Specific configuration for Android 9 and later

- Enable DuraSpeed for VerticalMan
- Some Android versions have custom way to configure the Apps with privileges to remain active in background or standby mode. The administrator need to inspect the system configuration to set it. Usually looking in the system configuration the word "Background" is easily found.
  In Samsung xCover6

Tap “Background usage limits”



Tap “Never sleeping apps”



Add VerticalMan with plus button

- From Android 13 there is only "Battery Management" which detects if an App uses too much battery and allows the user to limit this App. It is preferable to deactivate "Battery Management" to prevent the user from making VerticalMan with limitations not allowing carry out your duties in all situations.

21.3. Specific configuration for eCom SmartEx-02

- Set VerticalMan like emergency (red) button App:
  Configuration pannel->System->Custom functions ->Programmatically button ->Warning in the following set choice VerticalMan app:
    - Press all buttons
    - Long press
- Do not activate Battery->Energy saving, let alone automatic energy saving, because otherwise when the battery is below the level for energy saving, the system disables the antennas, first of all the GPS one and an incorrect configuration alarm is signalled.
- In the Apps->Advanced->Special access for apps->Battery optimization list, set the non-optimization of the battery for VerticalMan so as not to limit the operation in the background.
- If you use the alarm notification with telephone call, also install Aldea Nano Phone to have hands-free calls.

21.4. Specific configuration for Ruggear mobile smartphone

For this smartphone, it is not possible to use the PushToTalk notification for the TASSTA system and received push command from cloud.

The following parameters need to be configured in the Android settings:

- USB Preferences for File Transfer:
  - Enable Developer Mode
  - Set **<Developer> USB Preferences** to file transfer
  - Disable Developer Mode

Security > Screen Lock: None
- Enable: Battery Percentage
- Disable: Battery > "Battery Management" > "Use Battery Manager"
-App > Advanced > "Apps with Special Access" > "Battery Optimization": Set to "All Apps" and disable for VerticalMan
-Keys: Set wake-up and long-press application to VerticalMan

21.5. Specific configuration for iSafe mobile smartphone

iSafe IS360.2

For this smartphone, it is not possible to use the PushToTalk notification for the TASSTA system and received push command from cloud.

Follow the same configuration recommendations as for the RG360.

iSafe IS440

For this smartphone, it is not possible to use:

- Push-to-Talk notifications for the TASSTA system.
- Receiving messages from the cloud.
- Notifications via GSM phone calls (the system Phone app is not available) or via WhatsApp (since the system Contacts app is missing, it's not possible to initiate a call from other applications).

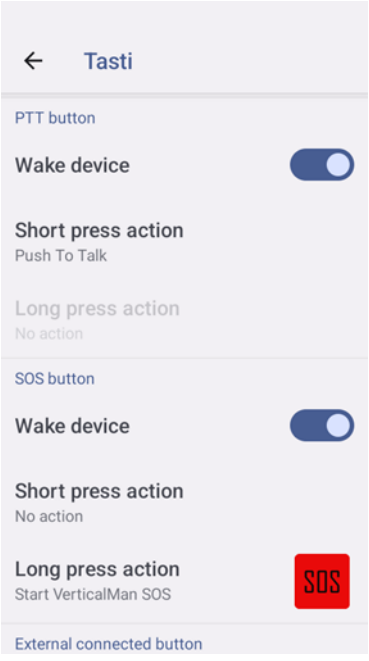
Due to the reduced screen size, the SOS and Pause buttons are not shown on screen, but these functions can be activated via physical buttons by associating:

- Our **StartSOS** app for SOS,
- The **StartPause** app for Pause.

To install APKs copied from a PC, copy them into the **Documents** directory, otherwise the Android file manager will not allow their execution.

iSafe IS530 and IS540

It is necessary to activate the parameter Advanced->Active Sensors in Standby.



To enable the physical SOS button, it is necessary to use the Aldea App, StartSOS, to associate it with the button for long press.

To perform notifications with phone call in speakerphone mode, it is necessary to use the Aldea App, NanoPhone, and set it as the default for GSM calls.

To install APKs copied from the PC, if the Android file manager does not allow them to be launched, copy them to the Documents directory.

22. Configuration

22.1. 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. It is recommended, in order to protect workers' privacy, not to include any data in the identifier that could be traced back to the operator, such as name, surname, employee number, etc.

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.

22.2. 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	Valorization 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 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.

22.3. 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

The backup files of the configurations in the Cloud are designed for short-term use, as they are deleted after a few months. It is recommended to perform a backup via file for long-term storage.

22.4. 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.

22.5. Restore configuration from Cloud

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

22.6. 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 eCoRo Web Lite 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).

The import of the configuration from eCoRoWeb does not take into account the deviceId key; therefore, the unique identifier of the operator remains the one set during the initial manual or automatic configuration.

23. 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 “Keep the sensors on even during stand-by” parameter, if even in this case it does not work well, you need to activate "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.

24. 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. **During this task 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.

If the device name has not been customized in the App configuration, when the license is activated it is automatically changed with a unique name formed by the first part of the license holder and the license identifier.

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

If a basic configuration has been set up on the Aldea Cloud upon license activation, this will be applied, in particular if web configuration management is envisaged, it will be immediately acquired by the configured eCoRo Web server. This function is particularly useful for customers with many VerticalMan who have centralized configuration management via eCoRo Web or an account on the eCoRo Cloud.

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.

The newVmDeviceId key is optional and allows you to define the new identifier before activating the license.

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.

25. 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, otherwise the license will be lost.

26. 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
Status: 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 Wi-Fi, 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
```

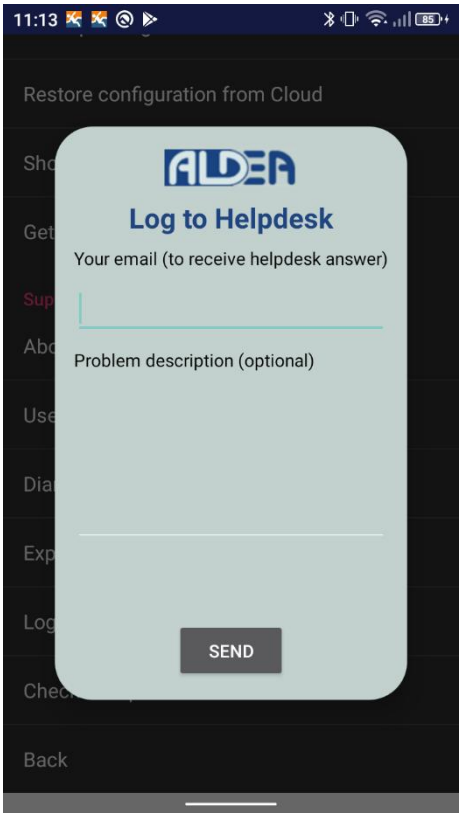
If the Web notification is active, it is also possible to activate the periodic transmission (1-60 min) of the system status, via the web via the configuration (Notifications Remote-> Web-> Send status VerticalMan via web)

Periodic sending of system status

If the alarm notification via Web is active, it is possible to activate the periodic sending (1-60 min) of the System status, via the web through the configuration (Remote Notifications-> Web-> VerticalMan status sending via web) allowing eCoRo Web to check if the device with VerticalMan has recently reached them, if not, raise a specific alarm.

If you activate the alarm notification via SMS, it is possible to activate the periodic sending (5-180 min) of the system status via SMS (Remote Notifications-> SMS -> "Periodic sending of system status via SMS"), allowing the eCoRo App to check if the device with VerticalMan is recently reachable.

27. 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.

28. Video Tutorial

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

Installation https://youtu.be/6GfUc3fpKCg		**SureLock Configuration** **https://youtu.be/mNoolIKjb3s**
Configuration https://youtu.be/poBQPupMGC8		**External sensor** **https://youtu.be/9b5Q82zhFUM**

29. 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

30. 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).