2019

MD3-ECO Operating instructions

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Unfortunately, there is no easily readable form which addresses both men and women equally. Thus, we only refer to "lone worker" or use the masculine form, knowing that this is not correct.

2 Introduction

Lone working is an important topic in companies e.g. during maintenance work, in sprawling warehouses or during delivery processes. The activity can be done easily by a single person, however, that also means that the person is out of sight and earshot of colleagues. No one can come to aid the person during an accident or other emergency situation.

This is where our personal emergency call device comes into play: Felsenmeer's MD3-ECO is used to safeguard lone workers. It can automatically detect an accident and call for help or also be used directly to report a dangerous situation.

MD3-ECO has been designed specifically for lone worker protection; it distinguishes itself by its sturdy design and ease of use. A well-configured MD3-ECO is inconspicuous in practical application: the lone worker switches it on at the start of the shift and does not need to worry about it until he puts it back in the charging cradle at the end of the shift. In a dangerous situation, the device automatically does the right thing - without intervention from the lone worker.

3 Operation and functional mode

Some activities within a company are carried out by persons working alone, e.g. when checking machines and plants across a large company site. In the event of an accident, rescue workers have to find the lone worker quickly to provide assistance. MD3-ECO supports this process by recognizing dangerous situations for lone workers and reports accident cause and accident location to the rescue workers.

The small, sturdy and easy to use MD3-ECO detects four potentially dangerous situations automatically. Furthermore, the lone worker can deliberately call for help with the blind-use alarm button. Automatically detected are:

Fall:

A fall can cause injuries which may require assistance.

Position:

Many tasks are carried out while standing. If the lone worker is horizontal, however, he probably requires assistance. For MD3-ECO, the detection can be configured in such a way, that lying down activities do not trigger an alarm - but a lone worker who is upside down would.

Too little movement (no movement alarm):

The lone worker moves for most tasks, however, not when he faints.

Deadman or time alarm:

Many monitoring tasks are carried out while sitting down. The lone worker has to periodically press a button to confirm that he is present and awake.

Loss alarm

If the lone worker loses the device, MD3-ECO can trigger an alarm. For this, a special holster is needed.

Geofencing

With geofencing, you can define allowed and prohibited areas. If the lone worker is outside of allowed areas or in at least one prohibited area, an alarm can be triggered.

No response

The lone worker can log off from the headquarters in order to carry out a short-term activity in an area without network coverage. If he does not report back on time, the Control Center triggers an alarm.

If a dangerous situation is detected, an acoustic pre-alarm is triggered. The lone worker can stop the alarm if he does not require help. The acoustic signal has been designed in such a way, that the lone worker can find the device quickly and is exposed to as little stress as possible - after all the pre-alarm is not meant to cause an accident.

If the lone worker does not stop the pre-alarm or he has deliberately requested help, then MD3-ECO reports the accident cause and the accident location which it finds outdoors using GPS and indoors using BEACON. For this, it switches seamlessly between both localization types.

For the transmission, the GSM or UMTS network is used. If UMTS is available, then data and text message can be sent faster. Voice connections are set up in HD quality - the caller's voice is more audible and clearer.

The transmission of the alarms can be configured freely. In the event of an accident, it is possible to send a data text message to the Control Centre, a clear text message in German to the one colleague and a clear text message in French to the other colleague. This makes it possible for them to come to the aid of the injured party if they are close by.

Furthermore, MD3-ECO can automatically establish an audio connection or wait for call-back and accept it automatically. In this way, crisis response can find out what kind of help is required.

Once arrived at the accident location, the rescue workers have to quickly find the lone worker. "Acoustic vicinity locating" feature provides assistance for this. MD3-ECO creates a loud acoustic signal using the integrated loudspeaker. This enables rescue workers to find the lone worker even in unwieldy areas, when he is unable to call for help.

The device is also easy to use in stressful situations which makes it a true personal alarm device. The large buttons can also be operated "blind" and the obligatory device test is supported with voice announcements during start-up. Persons, who rarely work alone, are able to use the device even after a short instruction period.

GPS is used for location identifier outdoors, within the building it is BEACON. MD3-ECO can also use CIPOLLINO, D.A.N.-Detector, gso, and gso-v.

4 Operating elements

The operating elements are explained in this screen, their meaning and use are explained in this document.

Status LED

Front speaker

Alarm LED (red)

Alarm button

Green button

Black button

On/off switch

Charging LED

Microphone

5 Use in daily routine

5.1 Start of shift

5.1.1 Switching on

The charging LED can also flash. The device is then at least 90% charged.

MD3-ECO stands in charging cradle at the start of the shift and is charged. This can be checked easily: the charging LED at the lower edge of the device lights up green.

Alternatively, he switches it on with the small on/off button at the bottom edge of the device.
If he pushes the alarm button, it directly triggers an alarm, which bypasses the device test and also functions if the battery is almost empty.

If the lone worker takes the device from the charging cradle, it switches itself on. It checks whether it has enough power for the shift - otherwise switches itself off again.

In order to ensure safe operation, a device test is performed.

5.1.2 Device test

The device test ensures that the device functions properly and is ready for use. The different functions are tested in a fixed order.

MD3-ECO shows with the alarm LED (red LED, just above the alarm button) that it is in test mode. The LED flashes in 1/4s cycle.

The announcements are available in different languages. They are activated on first use.

The device gives the announcement “test device” and then immediately issues the request “press green button”. As a reminder, that an input is needed by the worker, the sound signal is played in sound signal “low high low” until the button is pressed. This also triggers the process to accept a call.

The announcement “press alarm button” is issued. Again, a sound signal is issued until the large red button is pressed. In case of an emergency, help can be summoned directly. You can continue after pressing the button.

The step is omitted if these alarms are not used.

The device checks the situation in the background, an action is not required. This can be done very quickly.

The sensor system is checked in the next step for a series of involuntary alarms. The request is “hold vertical” - also with the speaker upwards and the microphone down. As best as possible hold at top and let it hang vertically. As soon as the device detects the location, it goes to the next prompt “hold horizontal”: for this simply put the device on the back - i.e. the back speaker.

This step is not necessary if the device does not use indoor localisation.

In order to direct the helpers as quickly as possible to the accident location, MD3-ECO needs to know the spot. During device test, check if there is a BEACON in the area which marks the current position. If MD3-ECO detects one, the announcement “device functions” is issued - the device test is finished and the shift can begin.

5.2 Normal operation

5.2.1 Device and connection status

The login is required for automatic connection test.

The device functions and logs in at the Control Center, the safeguarding is now active. This is displayed on the device with the status LED. If it flashes green every three seconds, then everything is fine. In detail, this means, that the

connection to the mobile network is established and that MD3-ECO knows the position of the lone worker.

If it flashes every second (“caution”) and MD3-ECO is beeping, then MD3-ECO has no connection to the network.

The acoustic signal can be switched off.

It can also flash blue every three seconds - the device does not know the position of the lone worker. This increases the time it takes to find him in the event of an accident.

MD3-ECO can be fastened to clothing with a clip or carried in a holster. The automatic detection of dangerous situations relies on the defined position to the body.

A “horizontal" position of MD3-ECO to body can be configured as an option.

MD3-ECO does not only check if it is in reach of a mobile phone network but also if it has a connection to the Control Center:

A person must learn about the accident and take the appropriate measures. This can only happen if there is permanent connection to the Control Center and alarms can also be displayed and processed.

Mandatory for systems that meet the DGUV directive 112-139.

This connection test can also be triggered by the lone worker manually by pressing the black button. This is intended to prevent false alarms in the Control Center if short periods of work are carried out in areas without sufficient mobile network coverage.

Only if the option (“manual life check”) is configured.

No data is sent to the Control Center - apart from the connection test - otherwise, the device would violate data protection, unnecessarily consume power and cause costs.

5.2.2 Calling and hanging up

MD3-ECO can be called like a normal phone. The status LED lights up green and MD3-ECO is ringing. Calls are answered by pressing the green button.

If the lone worker takes the call with the green button, then MD3-ECO works like a normal phone, i.e. it has to be held against the ear. MD3-ECO.uses the following rule of thumb:

Green button:
Begin, accept, hands free

If the lone worker takes the call with a keystroke, then he can also hold MD3-ECO to his ear.

This allows him to also make calls if there are loud ambient sounds. Pressing the green button again switches to hands free mode. Pressing the button again switches back normal telephone mode.

The call is ended with the black button. You can also use this button to immediately reject the call and to not even take the call.

Black button:
Reject, hang up, end call.

MD3-ECO.shows who calls: for numbers which are recognized as “Headquarters”, the alarm LED lights up.

5.2.3 Speed dial

If necessary, the green and black button can also be configured as a speed dial button; a keystroke then calls the saved number. The variety of functions on a button can overwhelm the lone worker. The speed dial should only be used if it serves to protect the lone worker.

The speed dial buttons have to be pressed for at least three seconds in order to prevent accidental calling.

The time threshold is configurable.

5.3 Alarm

5.3.1 Alarm button - deliberate alarm

In the event of an accident, the lone worker can trigger an alarm by pressing the red alarm button for a longer period.

To safeguard against accidental pressing, the button has to be pressed for a second - or longer, depending on configuration.

This also works if the device is switched off and if the battery is almost empty. MD3-ECO now processes the saved alarm chain.

The alarm chain can be very finely configured. It is therefore imperative to train the lone worker specifically. In addition to verbal instruction, we recommend putting up posters e.g. next to the charging stations, in the changing or break rooms. Furthermore, an exercise should be held at least once a year. The lone worker has to know the device and be familiar with the processes, so that he is actually able to get help in the event of an accident.

After triggering the alarm, the MD3-ECO processes a series of functions which are described in the next section.

5.3.2 Alarm chain process

The aim of the alarm chain is to distinguish real alarms from false ones and to also ensure that help arrives quickly at the right place. This looks like this in a normal case:

1. Alarm, time and location information are sent to the Control Center.
2. Call alarm centre.
3. Make phone call - this allows headquarters to assess the accident and to send the right help.
4. Change to “acoustic locating” mode to inform colleagues within ear-shot.
5. End alarm: the lone worker or a helper presses the black button for three seconds.

The same time is also used for speed dial and can be changed.

The lone worker presses the red button and lets go after one second. The device vibrates: the keystroke was detected. Establishes connection to the headquarters in normal phone mode i.e. the lone worker must hold it to his ear in order to make the call. A dial tone sounds in the handset.

Pressing the green button switches to hands free mode.

The alarm LED lights up and shows that an alarm is currently being processed. The status LED lights green and indicates that a voice connection is either being established or has been established.

The call is taken by headquarters. In parallel, the alarm, time and location information are sent to the headquarters. This works in different ways. The Control Center displays information - and the helpers are sent to the accident location.

Once headquarters has hung up, the lone worker must put the device to one side, then it changes into “acoustic vicinity locating”. It starts to make noise. Helper and colleagues can thus find the accident location especially if it is hard to spot.

Once the helpers are on site, it has to be reported to the device. Pressing the black button for three seconds stops the alarm and MD3-ECO changes back to normal operation.

This alarm chain is sensible in normal situations, alternatives are described in section 5.4. The next section describes automatic alarms.

5.3.3 Deadman or time alarm

Many monitoring activities are carried out while sitting down, the deadman or time alarm ensures that the lone worker is alert and healthy.

The period can be configured.

After a certain period has elapsed, an acoustic signal is sounded and the device vibrates.

The duration of the pre-alarm can be configured. The 30s are an example.

The pre-alarm notifies the lone worker that an alarm will be triggered if the black button is not pressed within thirty seconds. The black button ends the pre-alarm.

If the lone worker does not end the pre-alarm, then an alarm is triggered and the alarm chain from section 5.3.2 will be processed. The alarm was in this case not triggered deliberately by the lone worker: The telephone connection is established in hands free mode. If the lone worker is conscious, he can talk to the headquarters without having to operate the device.

5.3.4 Too little movement (no movement alarm)

A purely sitting activity during which the lone worker practically does not move is rather rare. In most cases, the lone worker will move and carry out a range of tasks. A lack of movement in this case can mean that the lone worker fainted.

The "rest period" can be configured. The 30s are an example.

In this case, MD3-ECO can trigger a no movement alarm: if the lone worker does not move for thirty seconds, then a pre-alarm is triggered.

The pre-alarm can be ended with the black button. In order to improve the comfort, it can also be reset with some movement.

If the lone worker does not end the pre-alarm, then an alarm is triggered and the alarm chain from section 6.2 will be processed. Once again, the telephone connection is established in hands free mode.

5.3.5 Fall

A fall can lead to injuries and mean that the lone worker requires help. Therefore, MD3-ECO is able to detect falls.

The sensitivity of the detection can be configured.

If MD3-ECO detects a fall, it starts the pre-alarm. The lone worker can end the pre-alarm with the black button.

If it is not completed, an alarm is triggered and the alarm chain of section 6.2 is processed. The phone call is made hands free.

5.3.6 Position

Many tasks are carried out while standing upright. If the lone worker is horizontal, however, he probably requires assistance. "Lying", however, does not necessarily mean the same thing for each lone worker. The angle can be adjusted. The normal setting is 45 ° - the lone worker does not always have to be in balance, slight variations are tolerated. In service situations with low height, it may be sensible to choose a different setting so that "almost horizontal" does not trigger a pre-alarm.

For activities done sitting down, MD3-ECO can go into fault especially if it has to be carried upright. In this case, it is possible to carry it with a special holster along the long, narrow side even while lying down. If configured accordingly, it does not trigger an alarm unless when MD3-ECO stands upright or rests on the front or back cover.

The duration can be set. The 30s are an example.

If an unhealthy position is detected for more than 30 seconds, then a pre-alarm is triggered. It can be ended with the black button. For reasons of comfort, it is also ended if the lone worker stands up again.

If it is not completed, an alarm is triggered and the alarm chain of section 6.2 is processed. The phone call is made hands free.

5.3.7 Loss

For some activities, it is conceivable that the lone worker loses the device - or is forced to give it up. MD3-ECO can trigger an alarm when it is removed from a special holster and the lone worker does not use it within thirty seconds.

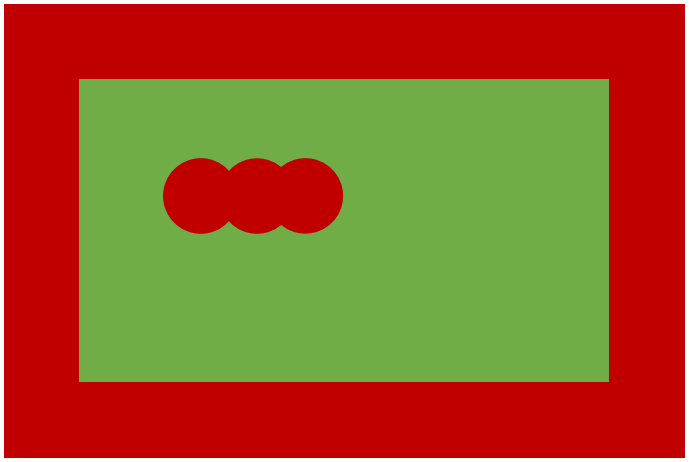
The pre-alarm can be muted here.

Once again, a pre-alarm is triggered which can be ended with a black button. An action (e.g. speed dial) or putting it back in the holster also ends the pre-alarm.

If it is not completed, an alarm is triggered and the alarm chain of section 6.2 is processed. The phone call is made hands free.

5.3.8 Geofencing

Geofencing is used to highlight areas which either should not be accessed or should not be left.



Such a situation is illustrated in in the picture. MD3-ECO ought to remain on the premises (green zone). On these premises, there is, however, an area which is too dangerous to be accessed and thus must not be entered. Initially, the premises are defined using GPS coordination. Here an alarm ought to be sounded if the lone worker leaves the area. Furthermore, three BEACONs are installed and also specified as a geofence. The alarm is triggered here if MD3-ECO receives one of these BEACONs. This warns the lone worker that he is entering this area.

MD3-ECO supports up to four GPS zones or up to five BEACON zones which can also be mixed. Furthermore, it can be configured when the alarm is to be triggered: On entering or when leaving. An alarm is triggered when the device:

- is at least within one prohibited zones or
- is outside of all permitted zones.

The correct definition of the resulting zone quantities requires some practice. A drawing can represent easily how the zones overlap. You can then do a “dry” run for all relevant cases and adjust them if necessary.

Once again, a pre-alarm is triggered which is ended with a black button. Accessing a permitted area also ends the pre-alarm.

If it is not completed, an alarm is triggered and the alarm chain of section 6.2 is processed. The phone call is made hands free.

5.3.9 No response

This alarm is signalled to the device and signalled on the Control Center. In this situation, there is no connection from the device to the Control Center - communication is not possible.

The check interval is configurable.

This alarm requires that MD3-ECO reports being switched on to the Control Center, regularly checks its connection to the Control Center and reports being switched off to the Control Center. The regular check tells the Control Center that everything is in order - then the Control Center waits for the next message

from MD3-ECO within the next half hour. If this message does not arrive, then Control Center will start an alarm.

If MD3-ECO has no mobile phone network and Control Center will soon trigger an alarm, then MD3-ECO will start a pre-alarm: The lone worker now has to find a location with network coverage and press the black button. This stops the pre-alarm and reports to the Control Center that everything is in order. The Control Center then waits again for the next message once the configured time interval has elapsed completely. The black button can also be pressed as a preventive method - i.e. when entering a dead spot. This allows the lone worker to work almost the entire configured interval in the dead spot without triggering an alarm.

When this alarm is active, then no speed dial can be selected with the black button.

The alarm chain is processed differently since there is no connection between Control Center and MD3-ECO. The Control Center triggers the alarm and it also has to complete it. A phone call or remote control is not possible.

MD3-ECO itself shows with a pre-alarm, that an alarm will be triggered in headquarters if no location with mobile phone network is found within the pre-alarm period. If a network is found, then MD3-ECO reports to Control Center and switches the pre-alarm off. Otherwise, Control Center triggers an alarm and MD3-ECO resets the pre-alarm.

5.4 End of shift

At the end of the shift, the lone worker places the device back into the charging cradle. The device then logs off from Control Center and switches itself off.

The behaviour when inserting into the charging cradle can be configured.

If the device is used for more than 24 hours, then a device test has to be carried out again (refer to section 5.1.2).

6 Alarm chains

6.1 Control round or watchman mode

In this mode, MD3-ECO sends the current position to the Control Center. With the help of the colleagues in the headquarters, it is possible to check if a watchman reaches a checkpoint at a specified time. If he does not reach it, then it may be an indication of an attack.

6.2 Planning an alarm chain

When planning an alarm chain, a series of questions have to be answered in order to ensure optimal safeguards.

6.2.1 Task

As a first step, the work of a lone worker has to be analysed. It is best to start with a description of the normal movement sequences.

If work is carried out while standing, you can use a position alarm. If the work is carried out while sitting down, then the comfort can be increased with a special holster and an adjusted position definition.

If the worker normally moves much, you can use the no movement alarm.

If the worker normally walks instead of running or jumping, it is possible to set the fall detection to the most sensitive setting. If jumps or sprints part of the normal sequence, then it is best to choose a lower sensitivity. At the least sensitive setting, you can at least detect if the worker has lost the device.

If the lone worker may only leave his place for a short period, then you can use the time alarm - and configure MD3-ECO in such a way that it remains switched on in the charging cradle.

Time alarm is also an option if work is carried out mostly whilst sitting in one position.

If attacks are a consideration, then the loss alarm may be suitable. This has to be accordingly integrated as part of the organisation.

The more automatic alarms are active, the quicker hazardous situations are detected. At the same time, it increases the number of pre-alarms and possible false alarms. The correct configuration is a compromise between causing stress to the lone worker by pre-alarms and false alarms and good accident detection.

6.2.2 Hazards and conditions

Each company has its own sources of danger. The accident insurer or expert staff can provide additional information. If sources of danger and potential accidents are known, then the necessary measures and response times can be determined.

The response time is an important information: It determines which detection and pre-alarm times are useful. These times should be short, no more than about 10% of the entire response time. Fire-fighters and ambulances in Europe are set up to react with 15 minutes response time i.e. the detection and pre-alarm time should not exceed 90 seconds.

If poisonous substances may leak, then the response time has to be significantly less - which has to be reflected in the settings.

Once the response times are clear, it has to be ensured that the helpers reach the accident location within that time period.

6.2.3 Resources

When planning the alarm chain, it has to be clear who has to be notified by when, how quick he can be on the scene and which auxiliary tools he may require on order to help effectively.

In some companies there is an in-house fire fighting team or company fire brigade which is the only way to ensure that the help is effective. In this case, it makes sense to place the Control Center with the in-house fire fighting team: The information about accident location and time will reach the right location seamlessly and the helpers know what to do.

This is not possible in all companies. In this case, you must consider if you want to hire an external security provider. The alarm log for MD3-ECO is integrated in many control rooms if not, there is the option to send the message as plain text. The exact processes have to be clarified. The service provider has to e.g. understand that in some cases a call will be triggered, but the lone worker may not necessarily be in a position to talk - and that help has to still be sent in these cases.

If different helpers are involved, then it is possible to initially establish a helper conference using a phone conference which helps to coordinate their actions.

If typically several possible helpers are on the spot, then MD3-ECO can initially send a message to all of them. To ensure that the message is not missed, MD3-ECO can call some of the helpers in sequence - an alternative to the phone conference. Once the call is taken, MD3-ECO can detect whether it is an answering machine. In this case, it hangs up and calls the next number. During configuration, it is important to note that each call takes time - the response times have to be observed nevertheless.

In an emergency, MD3-ECO can also call a public emergency number like 112. This happens if none of the saved helpers answers the phone within a certain time frame or if the lone worker presses the alarm button for ten seconds. However, this is only sensible to a certain degree: public emergency calls will

only send help if the lone worker is able to explain the situation - a security provider can make more sense here, since you can clarify these situations. MD3-ECO does not restrict the length of the called telephone numbers.

6.2.4 Working conditions and environment

The operational environment also has influence on planning the alarms. Here, you have to initially define in which areas lone working occurs. Good locating is important in those areas.

If the premises must not be left, then geofencing is an option.

Network coverage is not always the same on the premises. Here, you need to initially check which areas are not covered and how this relates to lone working. If the stay in the areas is short and there is a headquarters which interprets connection messages, then you can set the alarm to “no feedback”. This alarm is rather slow, since it is detected using the failure of feedback - in this way it resembles the time alarm.

If work is carried out in these areas for longer periods, then we recommend checking to retrofit network coverage for these areas. If this is not possible or appropriate, then the use of a gateway must be checked. Felsenmeer Gateway receives the alarms via ISM and forwards them. Voice connections, however, are not possible.

The ambient noise has to also be checked. The noise level of MD3-ECO can be configured.

6.2.5 Instructions and exercises

The actual alarm chain can be very complex - luckily it runs automatically, which means that the lone worker does not need to know the details. Important is, however, a good instruction and regular exercises, after all, the lone worker should not be stressed by the device but see it and use it as an aid when it comes to accidents.

The alarm chain should be presented on a poster, which is ideally put up near the charging stations. The focus is on the sequence during an accident and how the device serves as safeguard for the lone worker.

Exemplary alarm chains can be found in section 9.3, they have to be adopted to the relevant situation.

7 Safety instructions

To ensure the intended use as well as the safety, reliability and performance of the device, please read the following instructions before first commissioning.

Do not hold the rear loudspeaker to your ear. This may lead to permanent hearing damage.

If you have a pacemaker or wear other electronic medical aids, then please keep a distance of at least 20 cm between pacemaker and MD3-ECO.

Please ask your Hearing Care Professional if the emergency phone is compatible with your hearing aid.

Carry out device tests conscientiously.

Please do not use a damaged MD3-ECO.

Please ensure secure fit of the device to your body, otherwise MD3-ECO is not able to detect dangerous situations.

Check the connection to the mobile phone network regularly. The status LED flashes green every three seconds if MD3-ECO is connected to the mobile phone network. If it flashes yellow, the alarm cannot be forwarded.

The configuration of the person emergency signal function may only be carried out by trained expert staff or by our service.

Please get instruction on how the device works.

Please have someone explain the process in the event of an accident.

Charge the device as soon as possible if the charge the charge LED flashes yellow, the announcement “charge device” is audible or if three tones are sounded every 10 seconds with a decreasing pitch (high - mid - low).

Do not screw MD3-ECO open. It can become damaged or untight.

Protect the device against extreme environmental conditions. Prevent direct sunlight, especially in a car. Operate the device only in the specified temperature range.

Do not expose the device to extremely strong magnetic fields (e.g. induction furnaces and electric welding units).

Switch the emergency phone off wherever the operation of mobile phones is prohibited. Always adhere to local instructions and prohibitions.

If the rechargeable battery becomes untight in extreme cases, then have the device repaired. Signs for untightness are coverings on the housing and unusual or pungent odours. Do not breath in those fumes, do not touch the housing surfaces. Consult a doctor.

Switch MD3-ECO off prior to dispatch or for a longer storage period.

If stored for a longer period, the rechargeable battery has to be recharged every 3 months.

The change of a used rechargeable battery may only be carried out by expert staff.

Dispose the device at a collection point for electronic waste.

The power units of the charging cradle have to be plugged into accessible plug sockets.

Have defect or damaged charging stations and network parts replaced only with original parts.

Touching parts carrying mains voltage is a danger to life!

Protect the charging station and power unit against dirt, dust, humidity and wetness as well as direct thermal radiation.

MD3-ECO and its accessories may only be installed and operated outside of explosive areas.

8 Commissioning

8.1 Delivery scope

The supplied set includes:

- MD3-ECO Charging station
- Mains plug unit
- Fastening clip
- A commissioning manual

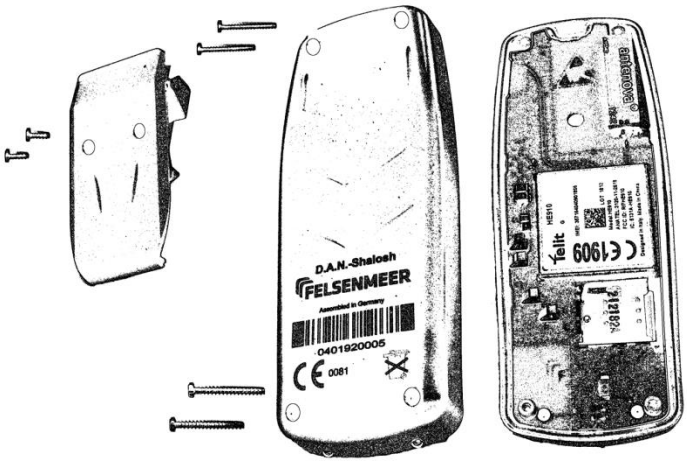
The components for this set are also available individually.

8.2 Assembly

The assembly is carried out by trained partners in an ESD protected environment. Maintenance work by the client is neither possible nor necessary.

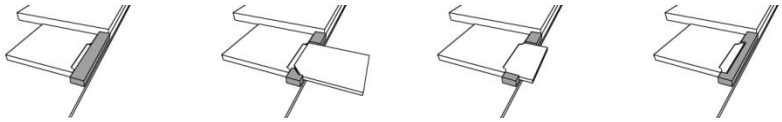
8.2.1 Prerequisites

- Handling of opened devices only at assembly workstations with ESD protection device and personal ESD protective equipment.
- Use a torque screwdriver (setting 25-30 Ncm) with blade Torx T6 for all screw connections.
- You require a Micro SIM card to install into the device. No prepaid SIM cards may be used.



8.2.2 Fitting

- Remove band/sleeve, open device. It consists of: back cover, mother-board and front cover. The motherboard may stick on the back cover, remove gently. *Take care when handling: Ensure ESD protection, do not touch contacts!*
- Insert SIM card:



For this press the foam flat, but do not remove it!

- Insert motherboard into front cover (alignment as per image).
- Check the height of the contact springs, if they are too low bend them slightly upwards.
- Connect both covers and close with the four long screws.
- Fasten clip with two screws to the back cover.

8.2.3 Charge

Plug the supplied power unit into the charging cradle. Charging cradle and power unit must not be damaged in any way. Place charging cradle on table and insert the power unit into the plug socket. The green LED on the charging cradle lights up.

Place MD3-ECO into the charging cradle. The yellow charging LED lights up permanently. MD3-ECO has deep discharge protection which prevents the rechargeable battery from being too deeply discharged and thus damaged. It is only switched off if the rechargeable battery is loaded up to 80%. This can take up to 4 hours. In this time, MD3-ECO does not display anything apart from the yellow charging LED and does not react when buttons are pressed. If the green charging LED flashes periodically (parallel to yellow charging LED or by itself) then MD3-ECO can be configured.

8.2.4 Configure

MD3-ECO.can be configured using a service stick. If the SIM card is PIN protected, then the PIN has to be configured in MD3-ECO.

8.3 Disposal

Please dispose these devices and components at a public collection point for electronic waste; they must not be disposed of with household waste.

W

9 Overviews

9.1 Operating elements and functions

The following depiction provides an overview of operating elements and their functions. If a certain function is actually available depends on the configuration.

Illustration	Description
	Status LED Front speaker Alarm LED (red) Alarm button Green button Black button On/off switch Charging LED Microphone

There is also another loudspeaker on the back. A vibrator is fitted to MD3-ECO, the charging contacts are at the bottom of the housing.

Element	*Function*
Status LED	*For switch on:* *Colour change red-green-blue* *If device error:* *Yellow: Sensor error, repair necessary* *Red: GSM/UMTS Module error, if it happens repeatedly then repair needed* *Blue: SIM card or PIN* *In normal operation:* *Flashes green every 3 seconds: Connected to network* *Flashes yellow every second: No mobile phone network* *Flashes blue every second: Location not known* *Steady green: Phone call active* *If alarm:* *Steady green, phone call active* *When switching off:* *Colour change white - yellow - violet*
Front speaker	*During a phone call:* *For all calls triggered by buttons.* *After switching to normal phone mode*
Rear speaker	*During device test:* *Announcement of voice support* *If device error:* *Announcement with description of error* *In normal operation:* *Short high beep: Action currently not possible* *Phone call after switching to hands free* *Dial tone, incoming call - caution: Loud!* *If alarm:* *For all involuntary alarms phone calls in hands free mode* *Phone call after switching to hands free* *Acoustic vicinity locating - take care: Loud!* *Dial tone, incoming call - caution: Loud!* *If rechargeable battery is low:* *Announcement: “charge rechargeable battery”* *Decreasing tone sequence*

Alarm LED	*In configuration mode:* *Flashes five times per second red* *During device test:* *Flashes twice per second red* *If device error:* *Steady red* *In normal operation:* *Steady red: Incoming calls from headquarters* *If pre-alarm:* *Flashes once per second red: Pre-alarm active* *If alarm:* *Alarm triggered and in process.*
Alarm button	*Short keystroke (<1s):* *Switches device on and triggers alarm* *Moves to the next test during device test* *In normal operation, starts time interval again for the time alarm* *Medium keystroke (>1s):* *In normal operation, triggers deliberate alarm. Is quitted by the vibrator.* *Ends an ongoing phone call and triggers an alarm - unless MD3-ECO is connected to headquarters* *Long keystroke (>10s):* *Trigger deliberate alarm, call the constantly manned alarm headquarters (e.g. public emergency number 112)* *Keep pressed down until the MD3-ECO dials*
Green button	*During device test:* *Starts device test* *In normal operation:* *Takes incoming call* *Starts time interval again for the time alarm* *Long keystroke (>3s) dials speed dial number* *If alarm:* *Takes incoming call.* *During an active voice call:* *Switches between hands free and normal phone mode*

Black button	*In normal operation:* *Rejects incoming call* *Starts time interval again for the time alarm* *Long keystroke (>3s) dials speed dial number* *Alternatively, a short keystroke tells the Control Center that everything is ok.* *If pre-alarm:* *Ends the pre-alarm* *Tells the Control Center that everything is ok.* *If alarm:* *Long keystroke (>3s) ends alarm - potentially only possible once the headquarters have been informed or once the headquarters has finished the call.* *During an active voice call or when dialling:* *Ends the call.*
On/off button	*If switched off:* *Switches device on.* *In normal operation:* *Switches device off.* *During alarm or error:* *Long keystroke (>10s) always switches the device off.*
Charging LED	*In the charging cradle:* *Lights up yellow: MD3-ECO is charging* *Lights up yellow and flashes green: MD3-ECO is charging* *Flashes green: MD3-ECO charged at least 90%* *Lights up green: MD3-ECO charged* *In error:* *Lights up yellow* *In operation:* *Flashes yellow: Charge device*
Microphone	*Phone mode:* *Normal sensitivity* *Hands free mode* *High sensitivity*
Charging con-tacts	*When removing from the charging cradle:* *Nothing happens or* *MD3-ECO is switched on.* *In normal operation:* *Nothing happens or* *MD3-ECO is switched off* *If alarm:* *nothing happens*

Vibrator	*Vibrates if:* *Keystroke, incoming call, pre-alarm and acoustic vicinity locating (if configured)*

9.2 Faults and their solution

Device is off and does not respond when keys are pressed

The device has been turned off recently - wait for a moment, try again.

The deep discharge protection is active - charge MD3-ECO.

Device does not charge - LED switched off at charging cradle.

Plug in power unit

Connect power unit to power

Inform Felsenmeer partner - defect charging cradle or power unit

Device does not charge - LED switched on at charging cradle.

Inform Felsenmeer partner - check charging contacts, rechargeable battery. Remove protective strip in MD3-ECO..

Announcement "charge device" and charging LED flashes yellow

If this happens too quickly after charging (less than a shift): Replace rechargeable battery.

Device cannot be switched on

Beeps briefly and the yellow LED lights up: Charge the device for about 4 hours. If you need to trigger an alarm urgently: Press the alarm button.

Error during device test

If there is an error during device test it is displayed with the status LED, alarm LED, yellow battery empty LED and the vibrator.

Announcement "SIM card missing" and status LED lights up blue: Inform shift manager, inform Felsenmeer partner.

Announcement "wrong PIN" status LED lights up blue: Inform shift manager, inform Felsenmeer partner.

Status LED lights up red: Fault on the GSM/UMTS module. Wait until device switches off and try again. If occurring repeatedly: Inform Felsenmeer partner. Repair by Felsenmeer.

Announcement "device error" and status LED colour lights up yellow (amber): Inform Felsenmeer partner. Repair by Felsenmeer.

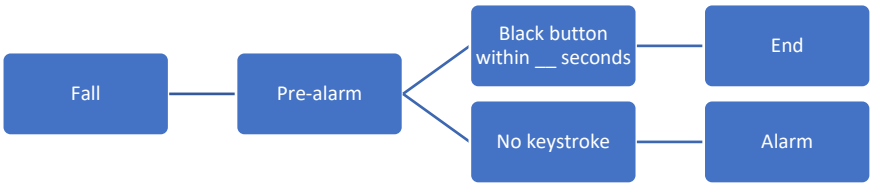
Announcement "test failed" and status LED lights up yellow (amber): Wait until device switches off and try again. A test step must not last longer than two minutes. If occurring repeatedly: Inform Felsenmeer partner. Repair by Felsenmeer.

Announcement "configure device", alarm LED flashes quickly: Inform Felsenmeer partner, import configuration.

9.3 Configuration - template customization

9.3.1 Automatic alarms

9.3.1.1 Fall

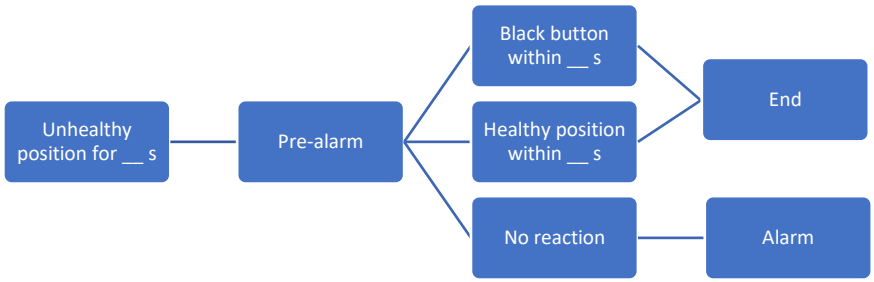


9.3.1.2 Position

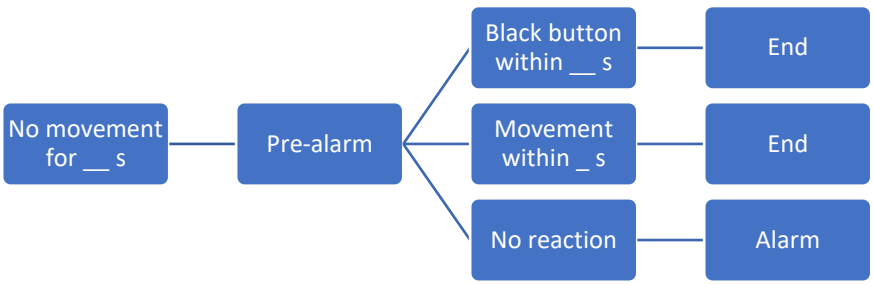
Please define first what a “healthy” or normal position is before defining the position alarm. MD3-ECO.should not interfere with the activity, the definition must thus match the activity and the used holster.

Image 1 Straight is normal

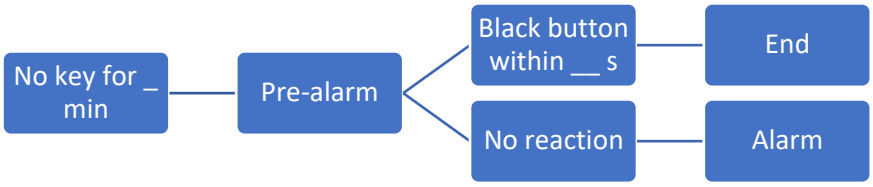
Image 2 Horizontal is normal



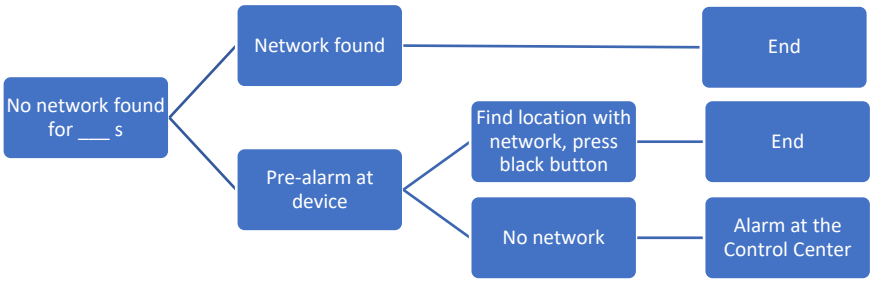
9.3.1.3 Lack of movement



9.3.1.4 Deadman or time alarm

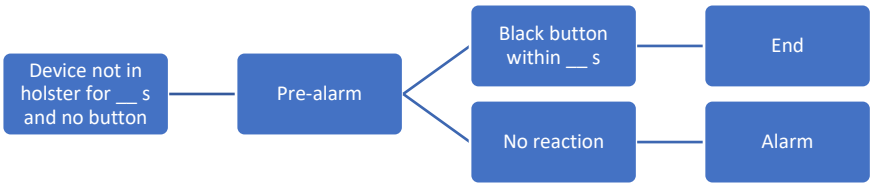


9.3.1.5 No response

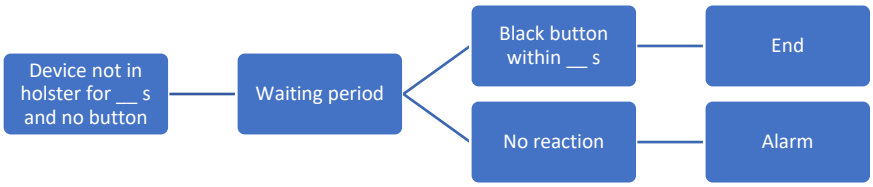


9.3.1.6 Loss alarm

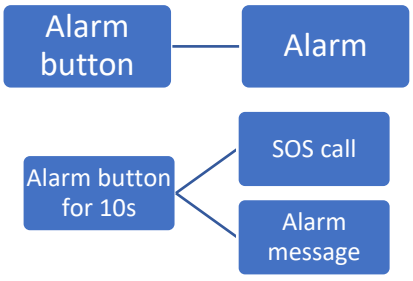
With signalling the pre-alarm



Loss alarm as silent alarm



9.3.2 Alarm per button (deliberate alarm)



9.4 Alarm process

9.4.1 Variant: First message, then call

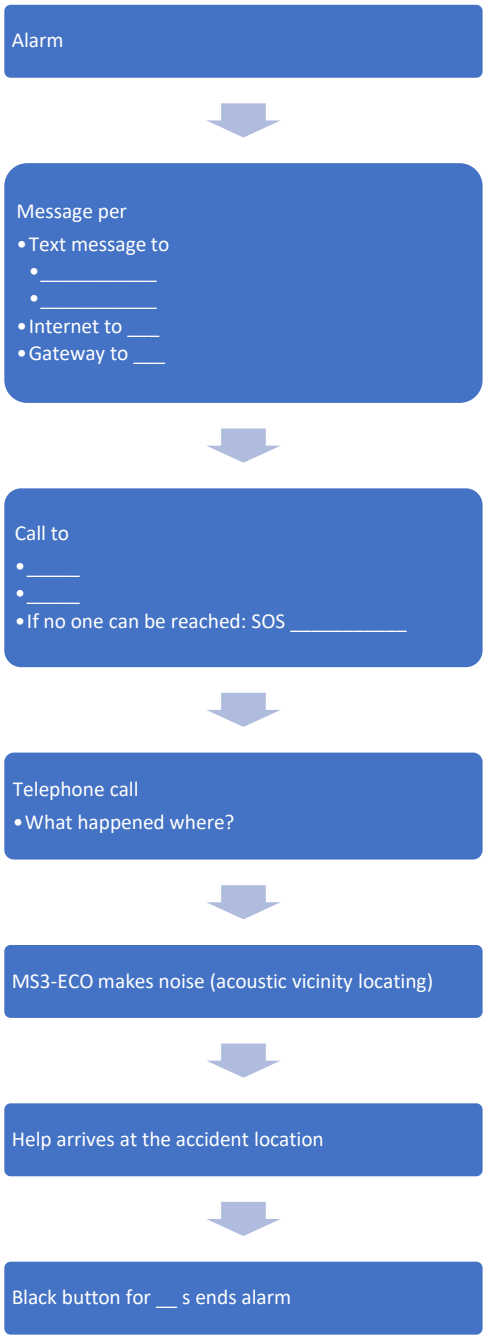
Forwarding the alarms can occur in three ways:

a) Per text message
b) Per internet (either http or TCP/IP)
c) Per Gateway – can be active in parallel to the other variants or only if there is currently no mobile phone network available
d) If neither mobile phone network nor Gateway is present, then acoustic vicinity locating is used.

Call with several numbers: the phone can only call one number at a time. The called party has to take call within _ seconds and it must be no answering machine. Otherwise, the next number on the list is called. If no person is reached when calling a number, then after _ seconds the SOS number _____ is dialled.

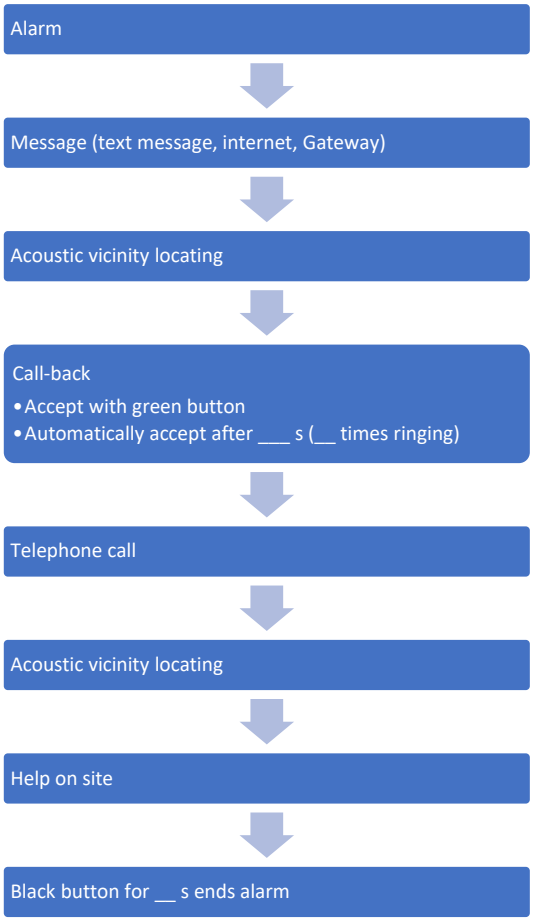
Alarm end has several variants, for this (almost) always the black button has to be pressed for 3s.

a) After processing alarm - only once the headquarters has finished the call.
b) After processing alarm, earliest once phone call with headquarters is in process. The lone worker can hang up here
c) At all times during processing the alarm
d) Automatically - i.e. after headquarters has hung up. If no headquarters phone number is saved, the alarm ends immediately.



In order to make use of this process, please configure the option “SMS4Call”. We recommend a value of 3s. Initially, a message is sent to headquarters, three seconds later the call is started. Whilst the call is in process, a message is also sent to the recipients with lower priority.

9.4.2 Variant: Message and call-back



This variant should only be used if a switchboard is used and it reacts on the message by instigating a phone conference.

10 Technical data

Size	115 mm x 43 mm x 26 mm, plus clip
Weight	approx. 100 g (with clip)
Protection class	IP 65 (dustproof and splash water resistant)
Battery type	3.7 V Lithium-Polymer rechargeable battery, 1.2 Ah
Operating duration	Talk time up to 8 hours Operating time • with indoor locating up to 70 hours • with outdoor locating up to 28 hours • without locating up to 200 hours
Charging time	Less than 5 hours
Frequency bands	900 MHz, 1800 MHz and 2100 MHz
	ISM for indoor locating and Gateway: 863MHz-870MHz
Transmitting power	33dBm at 900 MHz, 30 dBm at 1800 MHz, 24 dBm at 2100MHz, 0 dBm at ISM
SAR-value	0.474 W/kg
Locator	Indoor with BEACON ECO, CIPOLLINO, BEACON, D.A.N.-Detector, gso-v, gso Outdoor: GNSS, sensitivity about -162 dBm, switching automatically, indoor locating is preferred
Dial tone volume and Acoustic vicinity locating	maximum 110 dB SPL directly at loudspeaker
Microphone	Omnidirectional, high sensitivity for hands free, otherwise small
loudspeaker	1 x front loudspeaker for phone calls, 1 x rear loudspeaker for signal tones and hands free
Vibrator	Call signalling, keystroke, alarm
Certification	CE 0560
Alarms	Alarm button, fall, position, too little movement (no movement alarm) , deadman or time alarm, loss alarm (with holster), no response (with headquarters), geofencing
Functions without network	Alarm if response does not come in time, alarm forwarding via Gateway

11 Legal Notice

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