PACKTALK PRO

SAFETY. SOUND. STYLE

HOW DOES PRO'S CRASH DETECTION FEATURE WORK:

PACKTALK PRO crash detection solution is made of three key components:

- **PACKTALK PRO unit** – contains a built-in Inertial Measurement Unit (IMU), a dedicated hardware chip that continuously measures and records acceleration and angular velocity.

- **Smartphone** – contains the Cardo Connect App and continuously records GPS and velocity parameters. The smartphone connects the Pro unit to the cloud-based analysis unit, enabling the three-party handshake to work. The Cardo Connect app is also used to set, change, or modify the emergency contact.

- **Cloud-based analysis system** that receives potential crash alerts from the Pro unit and draws critical riding parameters both before and after the suspected crash event. The Cloud-based system runs the crash detection's main algorithm and, based on the inputs before, during, and after an event, determines if a flagged alert resulted in a real crash or not. The system is also in charge of sending an emergency communication to the pre-designated emergency contact.

Setting the unit via the Cardo Connect app for the first time, the user will be prompted to register and provide the connection details of an emergency contact. This contact can be edited, changed, or replaced at any given time through the Cardo Connect app.

The designated emergency contact will receive a text notification indicating he/she was chosen as an emergency contact by the user. The user will also be required to allow the app to continuously monitor several necessary phone parameters, such as GPS data. Without this consent, the crash detection service will not function.

When riding, the Cardo Connect app continuously works in the background to record and store riding parameters over a predetermined period. New riding data automatically overrides older data, like the ongoing function of a dash cam.

Upon sensing a potential crash via the onboard IMU, the PACKTALK PRO unit will immediately query the smartphone for GPS and velocity data and use the smartphone's data connection to ping the cloud-based analysis system – all within a split of a second.

Receiving the alert for a potential crash with the initial data, the cloud-based analysis system will query the smartphone for additional riding parameters preceding the crash event and continue to draw riding parameters following the crash event to determine rider's and bike's position and status following the suspected crash event.

In case the cloud-based algorithm, based on all the available pre-crash and post-crash data, decides a crash event indeed occurred, it will send a crash detection alert back to the smartphone and unit. The unit and smartphone will present the vocal and visual alert to the rider, who will then be given a pre-determined termination time to manually cancel the alert (such as in the case of a false-positive identification).

In case no cancellation is received within the predefined termination time the cloud-based system will send an emergency text message to the emergency contact. The message from CARDO will notify the emergency contact of the event and provide a link to the geo-location of the crash.
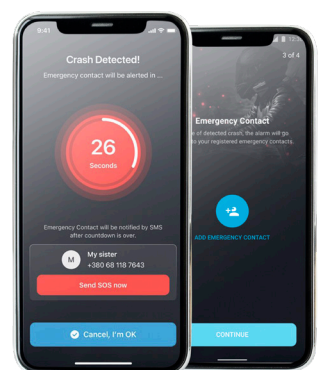
PACKTALK PRO

Why can't I just rely on my smartphone-embedded emergency service?

- Current native smartphone crash detection features are geared and tuned to car accidents (including, in some phones, the ability to hear the distinctive sound of shattering glass). Motorcycle crashes have a completely different profile and will unlikely trigger the phone's car-oriented crash detection mechanism. When Cardo crash-tested the system in a real-world simulation, we discovered most scenarios did not trigger the phone's native crash detection service into action. Our system and algorithms, on the other hand, are tuned to analyze the unique nature of motorcycle crashes and include numerous parameters (such as angular velocity and position changes, to name but a few) that are simply irrelevant in most car crashes.

- Packtalk Pro unit, with its embedded IMU, is helmet-mounted and feels what your head feels. This alone makes it much more accurate and reliable in understanding the severity of an accident – especially when compared to a phone that could just fly off unintendedly.

- By employing a cloud-based Analysis system as part of the overall solution, the Carso system is much more robust and reliable than any phone-based service. If the phone gets destroyed or just ceases to function after a crash, Cardo's cloud-based unit will still send an emergency message, ensuring the emergency contact gets the alert, no matter what.

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What happens when one crash detection sensor is flagging an accident while the other doesn't?
For example, when the unit detects a crash, and the app does not? What is the outcome when the opposite happens?

The crash detection mechanism combines real-time data received from both the phone and the unit to determine a potential crash. In this case, no single source has "the upper hand".
Based on the combined inputs, Packtalk Pro can decide to alert the cloud-based analysis unit via the phone's data connection in a split of a second. The cloud-based service can determine if a crash indeed happened, and only the cloud-based service can send an emergency notification.

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What happens if, during a crash, the phone gets smashed and seizes to function?

Upon receiving a crash alert, the cloud-based unit queries the phone for additional pre-crash and post-crash data. If no connection can be made with the phone (who, let's remember, was able to connect with the cloud and send a crash flag just a quick second before), the cloud unit will assume a crash did occur and will send an emergency alert to the pre-defined emergency contact.

What happens if, during a crash, my phone flies out of the BT range of the PACKTALK PRO unit but remains active?

The cloud-based system will still send a crash detection alert back to the smartphone. If not terminated within the designated time, it will assume a crash did happen and will send an alert to the emergency contact.

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How does Cardo define a "Crash"?

While defining the exact severity of a crash is ultimately in the eye of the beholder, Cardo aims to detect events at a severity that would potentially require medical attention.

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Could the system erroneously identify a unit or helmet drop as a crash event and notify my emergency contact?

Unlikely. In case of a flagged alert, the unit will query the phone for GPS data and velocity, and the cloud-based unit will then query for riding parameters before and after the flagged event. In both cases, the system will correctly identify the stationary nature of the event and ignore it.

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Could the system falsely identify a Crash (a.k.a. False Positive)? Will my emergency contact be notified of a Crash that never actually happened?

While Cardo's crash detection system was painstakingly designed to be the most robust in the business, we realize that no system is 100% foolproof. That is why the user is first given a vocal notification of an identified crash and a 30 second window to cancel it by either:

1. Press any button on the unit
2. Say "Ignore!"
3. Press cancel on the smartphone main app screen

If cancelled, the system will confirm cancellation with an audio message, and no notification will be sent to the emergency contact

Any button   OR   "Ignore"
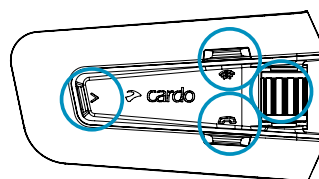
FAQ - CRASH DETECTION

Could the system falsely miss a real Crash (a.k.a. False negative)?

While Cardo's crash detection system was painstakingly designed to be the most robust in the business, we realize that no system is 100% foolproof. Cardo crash detection system is based on a learning algorithm and will constantly improve with more data gathered from riders around the world.

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What will happen if my emergency contact rides with me as my pillion?

No system is foolproof. We recommend NOT assigning the emergency contact to someone who rides with you. Changing the designated emergency contact is easy via the Cardo Connect app.

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Can I assign more than one person as my emergency contact?

At launch, the crash detection solution will allow for only one contact. Expect the number of designated emergency contacts to expand with future updates.

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Is a paid subscription required for the Crash Detection to be active?

You would need a phone with an active data plan to run the Cardo Connect App and connect it to the Cardo Cloud. All other elements of Cardo's Crash Detection solution are included in the price of the Packtalk Pro with no additional subscription required. Additional e-call services may be offered at a later stage and in selected geographies. These e-call services, when offered, will require an additional subscription.

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Would an e-call service be available in my country? If so, when?

An e-call service is a paid subscription to a live call center that dispatches first responders to a crash sight. The service will not be rolled out with the Pro at launch but will be offered at a later stage in territories where such service is available and pending on commercial agreements. Stay tuned.

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How will we convey the geo location of the accident to the emergency contact?

The emergency message will include a link to a geo-location that can be presented on Google Maps.

If I'm riding in a DMC group, would my group members receive any alerts?

At launch, the crash detection solution will not include this feature. We will be exploring this for future releases.

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What happens when the unit flies out of the cradle during a crash? Will it still detect it?

Yes, it will. The forces required to violently jerk the Packtalk Pro out of its magnetic cradle far exceed the G-Forces of a typical crash and will likely trigger a flag to the cloud-based unit before it even disconnects.

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What will happen if an accident occurs in an area with no data coverage?

At launch, the system requires data coverage to work. Solutions for situations where data coverage is unavailable are being explored for a later stage.

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What will happen if I refuse to allow Cardo Connect permission to access my physical activity, precise location, background location, emergency notification?

The crash detection feature will not be able to function without granting app permission to these parameters.

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Will the Crash Detection mechanism in my PACKTALK PRO work if I choose to ride without my smartphone or with my smartphone battery depleted?

Cardo's Crash Detection solution requires all three elements – Unit, Phone, and Cloud to work in concert. Without a function phone connected to a data service the solution will not work.

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What is the effect of the crash detection system on my PACKTALK PRO battery and operation time? What is the impact on my smartphone battery?

The Packtalk Pro hardware has been redesigned to accommodate the added crash detection mechanism with minimal impact to operation time. Expect about 13hrs talk time. The impact of the Cardo connect App on your mobile phone battery is similar to the effect of running a navigation app and is not compounded. This means that if you already run a navigation app on your phone the impact of the additional Cardo Connect App running in the background should be minimal.

FAQ - CRASH DETECTION

Can I switch off the Crash Detection solution on my Pro?
Yes you canGo to the Cardo Connect settings menu and switch crash detection from automatic to manual. In the manual setting you will need to indicate start of ride for the system to work. As long as you keep it off, it will not work.

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Does Cardo's crash detection tracks and store my riding routes in the background?
No, it does not. Cardo cloud does not record routes or store them on a continuous basis.

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Does Cardo's Crash Detection solution also cover off-road and MX environments?
At launch, the system will cover on-road/tarmac scenarios only. Future developments will target additional riding scenarios. Stay tuned.

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What does the PACKTALK PRO sensor measures?
Packtalk Pro's Internal Measurement Unit (IMU) measures acceleration (a.k.a. "G-Forces") and angular velocity on three separate axis.

FAQ - AUTO ON/OFF

How accurate is the auto on/off feature?
Packtalk Pro auto on/off feature is powered by the unit on-board Internal Measurement Unit (IMU) that detects an ongoing movement of the unit (such as putting in on the helmet, putting the helmet on your head riding on the street) and switch it on. Lack of movement (such as putting the unit a side for some time) will automatically switch it off.

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How do I activate the auto on/off feature? And can I deactivate it?
Just turn your Packtalk Pro to "ON", your unit will do the rest. You can always manually turn off this feature through the Cardo Connect app settings.

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Will my unit drain if I leave it in auto on/off mode?
The power consumption needed to wake up the unit for an auto off status is minimal. It will take several weeks to drain the battery.

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What should I do if I plan to store the unit for longer periods of time?
We recommend to manually switch your Packtalk Pro to "off" if you plan to store it for any meaningful amount of time.

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What should I do if I plan to move the unit while not in use (such as in air travel, travel, shipping, commuting, etc.)?
Make sure to manually switch your unit to "off". Safe travels.

NEVER RIDE ALONE.

CRASH DETECTION
Silently watching over you when you need it the most.

THE NEW
PACKTALK PRO