

STRATO



FLIGHTS



STRATOfinder Guide

**GPS Tracker to locate your
stratospheric probe**

Foreword

Thank you for your trust in our GPS tracker STRATOfinder and your interest in this very special mission. We would like to offer you the opportunity to experience an unforgettable adventure with breathtaking video recordings from an altitude where no planes will fly and where the black of space and the blue of our planet become visible - the stratosphere!

Stratoflights is launching stratospheric balloons since 2011. Our vision is to make the stratosphere accessible to everyone. Whether for research flights, school experiments, filmproductions or just as a family or adventure project - a Stratoflights is pure fascination and a real adventure.

We want you to join the „Hall of Fame“ of STRATOnauts so we put together the best equipment for you from our experience of over 1,000 stratospheric flights in our shop, so that you can carry out your own mission in the stratosphere.

If we could not find the optimal equipment on the worldwide market, we have developed our own products with our engineers. So far, we have developed parachutes, battery packs, data loggers and now the GPS tracker STRATOfinder according to our own requirements and have them produced for our customers from all over the world for a wide range of industries and applications.

The following guide will not only help you set up your STRATOfinder, but will also provide you with numerous notes, pictures and useful tips for your mission. However, to fully prepare for your stratospheric mission, be sure to check out the tutorial on our website. There you will also find helpful tools and our free Stratoflights app that will support you with many extras for your mission.

We wish you a lot of fun, success and great video recordings on your stratospheric flight adventure!

Your Stratoflights team



1 Table of contents

1	General instructions	7
1.1	Scope of delivery	7
1.2	Product view	8
1.3	Quick start guide	8
2	STRATOfinder: Loading, Initialisation and Activation	10
2.1	Loading process	10
2.2	Activating the SIM card	11
2.3	Inserting the SIM card and switching the STRATOfinder on/off	11
2.4	Installing the Stratoflights app	15
2.5	Integration of the STRATOfinder into the Stratoflights app	16
2.6	Settings and functions of the Stratoflights app	18
2.7	Adding more STRATOfinders to the Stratoflights app	21
2.8	Optional commands for SMS operation	23
2.8.1	Request GPS coordinates via SMS	23
2.8.2	Check whether the APN has been set	23
3	Installation of the STRATOfinder and further information	24
4	FAQ and troubleshooting	26
5	Technical specifications	29
6	Safety instructions	30
6.1	Signal words	30
6.2	Intended use	30
6.3	Safety	31
6.4	Battery operation	31
6.5	Electromagnetic compatibility	32
6.6	Cleaning	32
6.7	Dangers for children and persons in need of assistance	33
6.8	Storage	33
6.9	Disposing of packaging	33
6.10	General information about a stratospheric mission	34
7	Checklist: Perfectly prepared and thought of everything?	35
8	About Stratoflights	39

1 General instructions

Before use: Before using the STRATOfinder GPS tracker for the first time, please read this manual completely and with the utmost attention and follow the steps and sequences prescribed here exactly to ensure error-free setup and operation. Please keep this manual in a safe place. If you lose the manual, you can download it again digitally from your customer account.



1.1 Scope of delivery

The STRATOfinder GPS tracker is supplied with the following items. Immediately after unpacking your STRATOfinder, check the contents for completeness according to the following list:

- STRATOfinder GPS tracker
- Micro USB cable

Not included: SIM card

1.2 Product view

The following product photos are intended to give you a first impression of the STRATOfinder GPS tracker:



1.3 Quick start guide

To get your STRATOfinder ready for use, you can use the following quick start guide. Please note that all steps in the quick start guide are presented in abbreviated form. If you get stuck, take a look at the following chapters, where each step is explained in detail.

- Charge the STRATOfinder with the micro USB cable until it is fully charged. This is indicated by a red light. As soon as the red light is no longer lit, the STRATOfinder is fully charged.
- Make sure that your nano SIM card is activated, loaded with enough balance and the PIN query is deactivated. A prepaid card is sufficient. Important: The Stratoflights app can only be used if the SIM card tariff supports mobile data. Otherwise, however, it is possible to use the GPS tracker via SMS commands.
- Insert the nano SIM card into the STRATOfinder. There is a SIM card slot on the side under a cover. The SIM card snaps into place with a slight click. The STRATOfinder will start working. The STRATOfinder can only be switched off by removing the SIM card!
- The STRATOfinder will now connect with the satellites. This can take 2-3 minutes. Note that the STRATOfinder does not work inside houses, under roofs, in basements or in the direct vicinity of high-rise buildings, or may provide inaccu-

rate position data. It is therefore best to activate the STRATOfinder outside with direct visual contact to the sky.

- In order to use STRATOfinder and to pair the SIM card with the tracker, the so-called APN must be set. Send an SMS from a smartphone or mobile phone with „your“ APN to the telephone number of the SIM card inside the GPS Tracker. An example SMS command could be as shown in the following illustration: apn123456 internet.eplus.de You can find information about the APN of your mobile phone provider in the following instructions (see chapter 2.3) or on the Internet.
- After you have sent the SMS to the STRATOfinder, the STRATOfinder will reply within a few minutes via SMS with the command „apn ok“.
- Now the STRATOfinder should flash green. This means that the tracker was able to establish a connection to the GSM network.
- To use the STRATOfinder, you need the free Stratoflights app. This is available for all popular smartphones with Android and iOS and can be downloaded from the app store.
- Open the Stratoflights app on your smartphone and select the STRATOfinder button. Now you need the IMEI of the STRATOfinder. This can be found on the device or on the packaging. Now you can assign a „name“ to your STRATOfinder GPS tracker. After you have chosen a „name“, click on the „Add“ button.
- If the IMEI is entered correctly and the STRATOfinder is switched on with a clear view to the sky as described above, the STRATOfinder you have just set up will appear on the map in the Stratoflights app.
- To add more STRATOfinders and get to know the full range of functions, use the following instructions.

2 STRATOfinder: Loading, Initialisation and Activation

2.1 Loading process

Before using the STRATOfinder GPS tracker for the first time, it must be fully charged. To charge the STRATOfinder, you need the micro USB cable supplied. First open the right flap of the STRATOfinder carefully.



Now you can carefully insert the supplied micro USB cable into the port. Now connect the USB cable to your computer or use the USB charging adapter of your smartphone. Once the STRATOfinder is correctly connected to the power source, please charge it until the red LED no longer lights up.





Note: The STRATOfinder offers a runtime of approx. 3-4 days in normal conditions on earth, without charging in the meantime. However, it should be noted that the runtime depends on the usage as well as the extreme conditions of the stratosphere of temperatures down to -65°C . The more the STRATOfinder is moved and the more position data is sent and the longer the stratospheric flight, the higher the usage. However, the runtime of the STRATOfinder is by far sufficient for an average stratospheric flight of three to four hours including subsequent recovery!

2.2 Activating the SIM card

To be able to use your STRATOfinder, you need a SIM card with a mobile data tariff. The SIM card must be activated but the PIN deactivated. Make sure you use a SIM card from a mobile phone operator in your country that has the best mobile phone network. In Germany, these are mainly Telekom and Vodafone. You can find detailed information on how to activate your SIM card at the respective operator. Test the SIM card with a smartphone beforehand so that you can always be sure that the SIM card is really active!

2.3 Inserting the SIM card and switching the STRATOfinder on/off

Once the STRATOfinder is fully charged and your SIM card is activated, first insert the SIM card into your STRATOfinder. To do this, carefully open the left cover. Make sure that the SIM card is nano-SIM size and therefore the correct size.

Now slowly and carefully slide your SIM card into the SIM card slot provided, as shown in the following illustration. Make absolutely sure that the SIM card is inserted the right way (with the angled corner facing forwards and the contacts facing downwards, see photo). Carefully press the SIM card into the slot until it clicks into place.





Inserting the SIM card into your STRATOfinder automatically switches it on. If you want to switch off the STRATOfinder, the SIM card must be removed. We have deliberately omitted an on-off switch: With earlier models it has happened that the switch of the GPS tracker was activated by mistake when it was installed in the stratospheric probe. We want to avoid this accidental mistake and thus offer the greatest possible safety.

After inserting the SIM card into the STRATOfinder, the GPS tracker initialises itself and searches for GPS satellites and it parallel establishes a connection to the mobile phone network for data transfer. To enable the GPS Tracker to establish a connection to the GPS satellites for initialisation, it is best to take the GPS Tracker outside and leave it in the open air for a few minutes so that it can establish a connection.





Note: The STRATOfinder does NOT necessarily work inside flats, houses, in cellars or deep freezers, metal roofs or similar and the GPS signal can be disturbed in high-rise canyons as with any navigation device! The STRATOfinder requires „visual contact with the open sky“. Installation in your stratosphere probe made of polystyrene is no problem at all, as is proximity to other GPS trackers and other electronic devices available from Stratoflights in the shop.

After two to three minutes, the GPS tracker should have established a connection to the GPS satellites and the mobile phone network for data transmission. In order to be able to use the GPS tracker via the SIM card and thus via the mobile internet, the so-called „APN“ must first be set in order to set up the mobile internet for data transmission.

Mobile phone provider	APN
T-Mobile	internet.t-mobile
congstar	internet.t-mobile
klarmobile (0151)	internet.telekom
klarmobile (0152)	web.vodafone.de
klarmobile (0176)	internet.mobilcom
Vodafone	web.vodafone.de
1&1 D-Netz	web.vodafone.de
Aldi Talk	internet.eplus.de
O2 Prepaid	pinternet.interkom.de



Note: Please note that sending the SMS may incur costs. You can find information about the costs at your mobile phone provider.

Now send an SMS from a smartphone or mobile phone with „your“ APN to the telephone number of the SIM card inside the GPS Tracker. An example SMS command could be as shown in the following illustration: **apn123456 internet.eplus.de**

The SMS code always starts with „apn123456[blank]“, so you can replace the red part with the APN of your mobile phone provider (see previous page).



Now send this SMS to the SIM card in your STRATOfinder. Please make sure that all the steps mentioned above have been followed and, above all, that the GPS tracker has „visual contact with the open sky“. After you have sent the SMS to the STRATOfinder, the STRATOfinder will respond within a few minutes via SMS with the command „apn ok“.

Now the STRATOfinder should flash blue and green.



Blue LED: lights up continuously if the STRATOfinder has not yet found a GPS signal; flashes when the GPS position has been found



Green LED: lights up permanently if the STRATOfinder has not yet found a mobile network; flashes when the mobile network has been found.

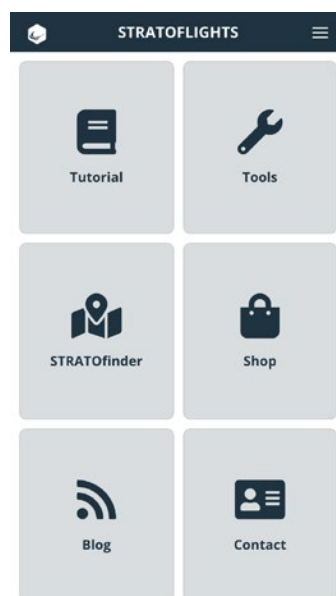
2.4 Installing the Stratoflights app

To be able to use the STRATOfinder GPS tracker, you first need the free „Stratoflights“ app. This is available in the app store for all common smartphones with Android and iOS operating systems.

Alternatively, you can scan the following QR code to start the download and install the app.



Once the download is complete and you have installed the Stratoflights app on your smartphone, open the Stratoflights app. The app provides you with the most important information for your stratosphere mission at a glance: Tutorials, various tools such as helium calculator and flight route calculation, a checklist, the shop, contact information, blog and the GPS tracker STRATOfinder.

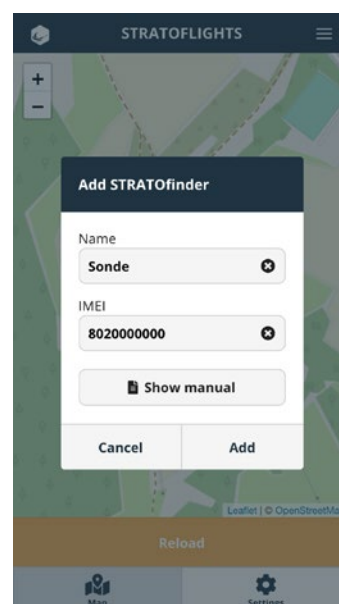
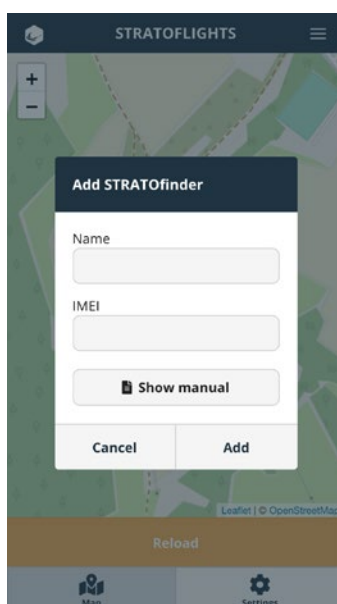
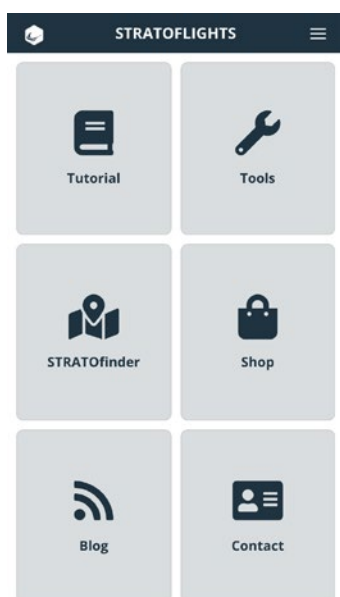


2.5 Integration of the STRATOfinder into the Stratoflights app

In order to set up your STRATOfinder GPS tracker after it has been fully charged, the activated SIM card has been inserted, the APN has been set and the Stratoflights app has been installed, you will need the IMEI number of your STRATOfinder. This IMEI number is a ten-digit number that you will find on the packaging or directly on the STRATOfinder.



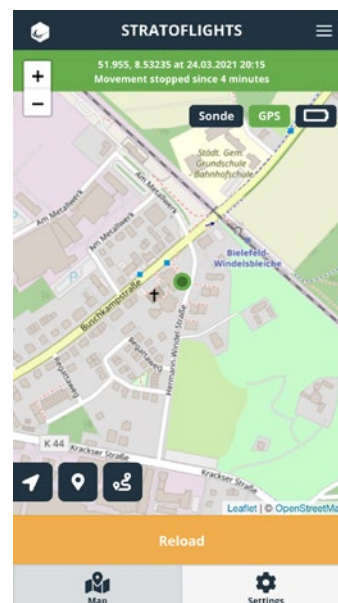
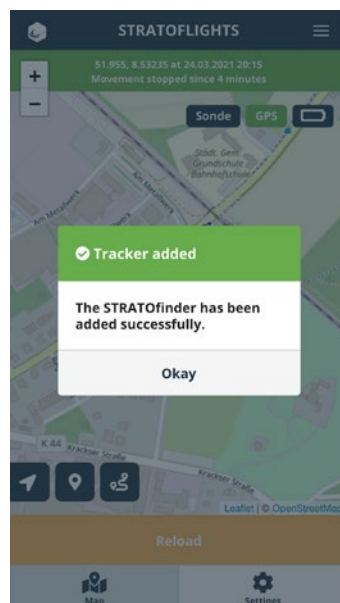
Now open the Stratoflights app on your smartphone and select the „STRATOfinder“ button. A window will open with the name „Add STRATOfinder“. Now you can assign a name to your GPS tracker STRATOfinder. After you have chosen a name, enter the IMEI and click on the „Add“ button.





Tip: You should give your STRATOfinder a unique name! For example, „Stratospheric Probe“, or if you are operating two STRATOfinders in parallel, name the second one „Parachute“, for example, if it is attached to a parachute. This way you know exactly which STRATOfinder is currently sending you the position data. If you are using two STRATOfinders, it is best to label them directly on their cover to avoid confusion!

If the IMEI is entered correctly and the STRATOfinder is switched on with a clear view to the sky as described above, the STRATOfinder you have just set up will be displayed on the map:



2.6 Settings and functions of the Stratoflights app

The Stratoflights app offers various setting options, views and functions in the STRATOfinder GPS tracker area, which are briefly described below:



1 In this green area, the position data is given in longitude and latitude and information is provided about the date and time at which the data was last sent and whether, for example, the „movement“ of the GPS tracker has been stopped. If the point no longer changes, the stratospheric probe has most likely landed at these coordinates.

2 Use these symbols to zoom in and out on the map.

3 Reception: If the STRATOfinder cannot receive a sufficient GPS satellite signal, it switches to LBS. LBS means Local Base Station (= GSM network). The STRATOfinder tries to determine the location using a Wifi network or the position of the nearest GSM masts, which is relatively inaccurate. However, the transmission of the position via GPS (=Global Positioning System) is more accurate. The more satellite signals the GPS tracker can receive, the more accurate the location. This is the case if the STRATOfinder has an unobstructed view of the sky and is not located indoors.

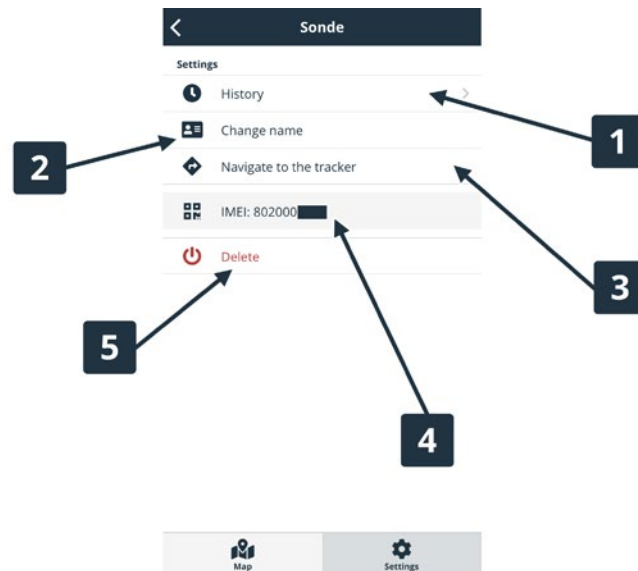
- 4** The battery icon shows the battery status of your STRATOfinder.
- 5** This icon can be used to switch between several STRATOfinders, provided at least two STRATOfinders have been set up. Otherwise this icon is not visible.
- 6** Click on the arrow to display your current position or the position of the smartphone currently using the Stratoflights app. The position is represented by a blue dot on the map.
- 7** Click on this button to request the current GPS position of the STRATOfinder.
- 8** Clicking on this button opens Google Maps and suggests a route from your position to the last position data sent by STRATOfinder, so that you can easily navigate to this position.
- 9** Mit einem Klick auf diesen Button wird die aktuelle GPS-Position des STRATOfinders abgefragt.

Click on „Settings“ to display the device list. Here you will find information on the STRATOfinder currently in use and the link to this manual.

By clicking on „Add STRATOfinder“ you can add further STRATOfinders, e.g. in order to have the greatest possible security with a different mobile phone provider. In some countries there are still dead spots in the mobile network, so that the GPS tracker may not be able to send its position data via the mobile network. This risk can be reduced by using a second STRATOfinder with a different network provider.



By clicking on the device name, you can view history of the GPS position data sent, rename the selected STRATOfinder, navigate to the tracker or delete the STRATOfinder from the app.



- 1** Under „History“ you can call up the saved GPS position of your tracker. To do this, first select a time period or interval. The coordinates of the tracker for the selected period are then displayed on a map.
- 2** Click on „Change name“ to change the name of your STRATOfinder at any time.
- 3** Click on „Navigate to the tracker“ to retrieve the current position of the STRATOfinder and to determine a route to the GPS position of the STRATOfinder sent via Google Maps.
- 4** The assigned IMEI of your STRATOfinder is indicated here. You will also find the IMEI on the housing of your STRATOfinder and on the packaging.
- 5** This allows you to remove the STRATOfinder from the Stratoflights app.

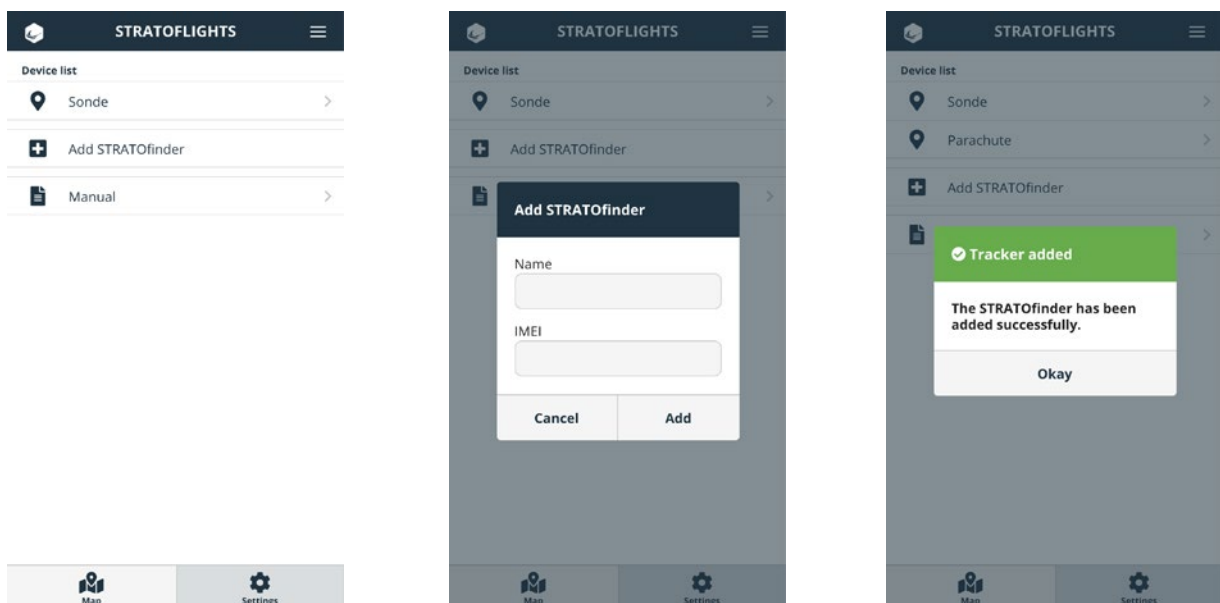
By clicking on „Add STRATOfinder“ you can add further STRATOfinders, e.g. in order to have the greatest possible security with a different mobile phone provider. In some countries there are still mobile network gaps, so that the GPS tracker STRATOfinder may not be able to send its position data via the mobile internet. This can be remedied by using a second STRATOfinder with a different network provider.

2.7 Adding more STRATOfinders to the Stratoflights app

To get your stratospheric images, you need to find your stratospheric probe. In Germany and in almost all countries of the world, there are regions with smaller or larger dead spots in the mobile phone network, these are regions that are not covered by the mobile phone providers. For example, it can happen that a region in Germany is covered by the D2 network, but no D1 network is available. In this case, the STRATOfinder may not be able to establish an internet connection to transmit its position data, and thus the stratospheric probe, including its technology and cameras, cannot be located and recovered. This scenario varies from country to country due to differences in network coverage.

To minimise this risk, a second STRATOfinder may be useful. For example, if you decide to operate the first STRATOfinder with a D1 network and the second STRATOfinder with a D2 network, you should add both STRATOfinders to the Stratoflights app. This way you will receive the position data from both GPS devices and will be in the best possible position.

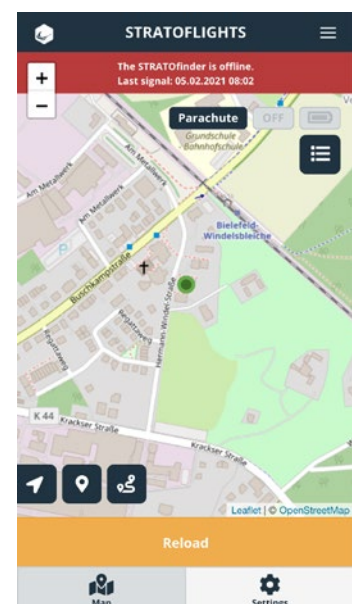
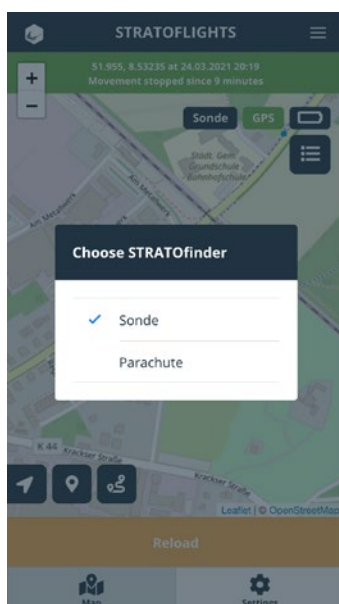
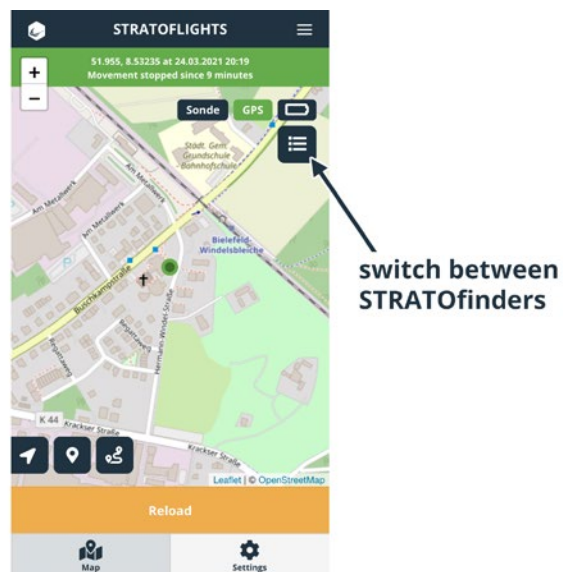
To add another STRATOfinder to the Stratoflights app, click on „Settings“ and select the menu item „Add STRATOfinder“. Now enter the name and IMEI of your additional tracker.



It is not possible to display both STRATOfinders simultaneously on one map. To switch back and forth between the two devices, select the following button as shown in the illustration to access STRATOfinder B, for example.

You can easily find out which STRATOfinder is currently displayed on the map: The name of the currently displayed STRATOfinder is shown at the top.

With two STRATOfinders, you are well equipped for your mission.



2.8 Optional commands for SMS operation

You can also use your STRATOfinder without the Stratoflights App, but we would like to point out that not all functions are available and we recommend using the free Stratoflights App!

2.8.1 Request GPS coordinates via SMS

The GPS coordinates can be requested via SMS. Before doing so, however, STRATOfinder must be set up as described in the previous chapters. Only the installation of the Stratoflights app can be omitted. To request the current GPS coordinates via SMS command, send an SMS with the following command via SMS to the phone number of your SIM card: G123456#.

STRATOfinder will respond promptly with an SMS containing the current position data of STRATOfinder, as well as a link to the GPS position in Google Maps to navigate to the GPS position.

2.8.2 Check whether the APN has been set

You can check this with a simple SMS command. Send an SMS with the following command to the phone number of the SIM card of the STRATOfinder: check123456

3 Installation of the STRATOfinder and further information for your mission

Probably the most important element for a successful „space mission“ is the GPS tracker. It decides between success and failure and is therefore the „life insurance“ for a successful stratospheric mission. The STRATOfinder is an extremely high-quality and reliable device and sends its exact position data to your smartphone via mobile data or SMS. This allows you to precisely locate and recover your stratospheric probe after it has landed. The special feature of the STRATOfinder compared to other devices is the huge GPS antenna, because it is four times larger than those of other manufacturers and a small but extremely important feature. Because this large antenna makes it possible to transmit data even in very remote regions where reception is also very poor.



Expert tip: Check which mobile phone operator has the best mobile phone network in your country and get this SIM card. In Germany, for example, the D1 network is the best. This is important because some mobile phone providers have poor network coverage in some regions, especially in rural areas. If your stratospheric probe lands in such a „dead zone“, STRATOfinder will be unable to send its coordinates due to the lack of a mobile phone network. In this case, we recommend either equipping a second STRATOfinder with a different mobile phone card, e.g. D2 in Germany, or using a GPS tracker SPOT Trace. The SPOT Trace works independently of the mobile phone network in extreme regions such as deserts, mountains or even on the open sea and can therefore be a useful addition. Depending on whether a second STRATOfinder or SPOT Trace is used: a backup system increases the chances of successful locating and recovering the equipment and should be included in your plans if possible.

Further information and a comparison and listing between the STRATOfinder and the SPOT Trace can be found here:



<https://www.stratoflights.com/en/tutorial/optimal-equipment/>

Please note that all devices available at Stratoflights, whether the GPS tracker STRATOfinder, the GPS tracker SPOT Trace, data logger etc. can all be used together and do not interfere with each other!

You must protect your STRATOfinder GPS tracker from the extreme conditions of the stratosphere. Therefore, it is recommended that you use a polystyrene probe, as this provides good protection against the temperatures of up to -65°C .

The best way to attach the STRATOfinder to the base of your styrofoam probe is with a strip of TESA tape. You can use two layers of TESA tape to create a kind of double-sided adhesive tape.



You can attach this to the bottom of the STRATOfinder and fix it to the bottom of the Styrofoam probe. Make sure that the Stratoflights logo on the top of the STRATOfinder is pointing towards the sky, as this is where the GPS antenna is located for optimum reception.

Detailed information on the installation of additional equipment such as camera, data logger, SPOT Trace & Co. as well as valuable tips & tricks for the entire stratospheric mission can be found in the weather balloon manual.

4 FAQ and troubleshooting

The LED for charging the STRATOfinder does not light up?

Check whether the micro-USB cable is correctly plugged into the STRATOfinder connector and whether the STRATOfinder is already fully charged.

How high is the GPS accuracy?

The STRATOfinder GPS tracker has a 3x3cm GPS antenna with excellent characteristics and offers the greatest possible reliability even in very remote regions. The accuracy of the position data is approx. 5 metres. Under certain circumstances, the GPS antenna can be disturbed, which can lead to inaccuracies in the immediate vicinity of high buildings and street canyons, for example.

The STRATOfinder does not transmit a GPS position!

Please follow the steps in these instructions very carefully. If you are using your own SIM card, make sure that it is activated, has enough balance and the PIN query is deactivated. To check this, you can insert the SIM card into a mobile phone beforehand. If you have a prepaid SIM card, you can type *100# on the keypad and dial, then the credit balance will be displayed. Please note that the STRATOfinder requires visual contact with the sky and cannot be operated in flats, houses, basements or under roofs or in the direct vicinity of high-rise buildings or, as with any other GPS device or navigation device, the GPS signal can be distorted by the partitioning of high houses and roofs and ceilings.

After the balloon lifts off, I no longer have a signal. Why?

The GPS tracker only works close to the ground because it relies on the mobile network. As soon as the balloon has lifted off, the STRATOfinder has no signal anymore. Only when it is close to the ground again, after landing, the STRATOfinder can locate itself again.

Where can I find the APN and the phone number of the SIM card?

You can find your mobile phone number in the documents from your mobile phone provider. You can find out the APN by Googling for your mobile phone provider and the keyword APN. We have listed some examples in chapter 2.3.

Setting the APN does not work.

Please check on the Internet whether the APN of the provider you have chosen is correct and whether you have entered the APN correctly. The APN may change from time to time!

Can I check whether the APN has been set without using the Stratoflights app?

You can check this with a simple SMS command. Send an SMS with the following command to the phone number of the STRATOfinder SIM card: „check123456“.

Can I change the name of the STRATOfinder later?

Yes, you can rename your STRATOfinder via the Stratoflights app under Settings as described in the previous chapter.

Does the Stratoflights app have to be used to operate the STRATOfinder?

No. However, we strongly recommend using the Stratoflights app in order to be able to use the full range of functions. The setup and query of the position data can also be carried out by SMS commands according to the previous chapters. Please note the information on possible costs incurred by your mobile phone provider for sending SMS messages!

Does the STRATOfinder automatically send its current position?

Whenever the STRATOfinder changes its position, it automatically sends its position data. If it is no longer updating its position data and has therefore returned from the stratosphere, this is the sign that the probe has landed. Note: If the probe with the STRATOfinder is hanging in the tree, the probe might move and the STRATOfinder might send more data. Of course, this data just slightly changes so that this position should be approached for the recovery of the probe.

Can I add more STRATOfinder GPS trackers to the same view in the Stratoflights app, i.e. operate two STRATOfinder GPS trackers in parallel via the app?

Yes. Another icon appears in the top right-hand corner. This allows you to switch back and forth between the implemented STRATOfinders in the map view. It is not possible to display two STRATOfinders on one map at the same time.

Can I use the STRATOfinder for other applications than stratospheric flights?

You can also use the STRATOfinder for other applications, e.g. for monitoring your car, boat or motorbike. However, please note the legal regulations in your country and the further information in the appendix.

Can other GPS trackers not offered by Stratoflights be integrated into the app?

No. Only one or more STRATOfinders can be integrated into the Stratoflights app.

Do I have to enter the phone number with country code?

Yes, please enter the country code when entering the telephone number. For Germany, for example, this is 0049, but please note at the same time that the first digit of your mobile phone number is then omitted. If your mobile phone number is 0151 123456, for example, it will be indicated with the country code as follows: 0049 151 123456 or +49 151 123456. You can find information about your country code on the Internet.

Can I use an existing SIM card?

In any case, check whether the SIM card has been activated, has enough balance and the PIN query is deactivated, ideally before inserting the SIM card into STRATOfinder for the first time. Check that you use a tariff with mobile data.

Can the current position be requested manually from the STRATOfinder?

The STRATOfinder automatically transmits its position data to the Stratoflights app at regular intervals. A purely manual request can be made via SMS. To do this, send an SMS with the command „G123456#“ to the STRATOfinder and it will send its position back by SMS in response to this request.

Can the GPS Tracker also send the altitude in addition to its position?

No. The STRATOfinder is intended for position determination. The STRATOfinder cannot transmit the altitude. One of the reasons for this is that the mobile phone network does not work at altitude.

Can several smartphones access the GPS Tracker STRATOfinder?

Provided that the Stratoflights app is installed on the smartphones and the STRATOfinder is set up accordingly, the position can be accessed from an unlimited number of smartphones.

5 Technical specifications

The STRATOfinder GPS tracker has the following technical specifications:

Weight:	130g
Dimensions:	77 x 25 x 48mm
Battery power in mAh:	3,8V 3.400mAh Li-ion
Standby time:	Depending on usage level: 24-72 hours *
GPS accuracy:	Approx. 5 metres
Time to start:	1-3 min
Network / Band:	FDD-LTE B1/B3/B5/B7/B8/B20 Dual-Band UMTS/HSDPA/HSPA+ B1/B5/B8 GSM/ GPRS/ EDGE 900/1800 MHz
GPS chip:	Qualcomm MDM9607
GSM/ GPRS module:	IlmCOM SIM7600E
Storage temperature:	From -40°C to +80°C
Operating environment:	From -40°C to +80°C
Humidity:	10%-70%

* **Note:** The STRATOfinder offers a runtime of approx. 48 hours under normal conditions on earth, without intermediate charging! However, it should be noted that the runtime depends on the load as well as on the extreme conditions of the stratosphere of temperatures down to -65°C. The more the STRATOfinder is moved by Stratoflights and the more position data is sent and the longer the stratospheric flight, the higher the utilization. However, the runtime of the STRATOfinder is by far sufficient for an average stratospheric flight of three to four hours including subsequent recovery!

6 Safety instructions

Please be sure to observe the following safety instructions that apply to the product. Please also observe the additional safety instructions when preparing and carrying out a stratospheric flight!

6.1 Signal words

Die folgenden Signalworte werden in dieser Bedienungsanleitung verwendet:

- **WARNING:** This indicates a medium-risk hazard. Disregarding the warning may result in serious injury.
- **Notice.** This warns of possible damage to property.
- **Expert tip:** This is based on our own experience from 10 years and over 1,000 stratospheric flights! Stratoflights does not accept any guarantee or liability for the expert tips mentioned here.

6.2 Intended use

Read these safety instructions for this GPS tracker STRATOfinder, hereinafter referred to as STRATOfinder, carefully before use in order to be able to use it properly. The intended use is to use the STRATOfinder only as described in this manual to locate an object such as a stratospheric probe. Please note that it is a criminal offence to monitor third parties using a GPS tracker without their consent. If you use it in any other way, it is considered improper and can lead to property damage or even personal injury. Please note that the STRATOfinder is not a child's toy.

Each country and region has different laws regarding digital positioning and tracking of people, animals and/or objects. Stratoflights GmbH & Co. KG is not responsible for violating such laws or regulations, this is solely the responsibility of the user.

Notice! The manufacturer and dealer accept no liability for damage caused by improper or incorrect use.

6.3 Safety

WARNING! RISK OF ELECTRIC SHOCK!

Incorrect electrical installation or excessive mains voltage can lead to electric shock.

- Before use, check the mains voltage of the socket against the information on the rating plate.
- To ensure that you can disconnect the charging cable from the mains as quickly as possible in the event of a fault, connect the mains adapter so that it is easily accessible.
- If you notice any visible damage to your STRATOfinder or the micro USB cable, do not use it.
- Only use the original parts supplied to charge the GPS tracker. If the charging cable is damaged, only replace it with original accessories from the manufacturer.
- Use an existing mains adapter that is in perfect condition, e.g. from your smartphone or charge the STRATOfinder via the micro USB cable on your computer.
- Never place the STRATOfinder near an open fire or hot surfaces.
- The STRATOfinder is not protected against moisture and water. Therefore, please use and store it only in a dry environment or inside a Styrofoam probe during the stratospheric flight.
- The charging cable should only be used indoors. Keep it away from moisture and do not bend it.
- Do not open the housing of the STRATOfinder.
- Leave repairs to qualified specialists. However, if you carry out repairs yourself, connect the STRATOfinder improperly or operate it incorrectly, liability and warranty claims are excluded.

6.4 Battery operation

WARNING! RISK OF EXPLOSION AND FIRE!

In the following you will find information and instructions on how to handle the battery:

- The STRATOfinder is powered by a lithium-ion battery. This is not replaceable and must not be removed or opened.
- Make sure that the STRATOfinder (also when charging the battery) is kept away from heat sources and high temperatures, such as direct sunlight in a vehicle.
- Failure to comply with this instruction may result in destruction of the battery and overheating, explosion and fire.

- Only use the original accessories supplied for charging. If charged in any other way, overheating, explosion or fire may result.
- Do not burn or pierce the STRATOfinder. Protect it from mechanical damage.
- Do not remove, drop, disassemble or modify the battery with sharp or pointed objects.
- If a child swallows the battery, seek medical help immediately!
- If you need to have the battery replaced, please contact our support team.

WARNING! RISK OF CHEMICAL BURNS!

Batteries that leak due to damage can cause chemical burns if they come into contact with the skin. Therefore, never open the battery!

However, if the battery does leak, be sure to wear protective gloves!

6.5 Electromagnetic compatibility

Please observe all rules and prohibitions and switch off the STRATOfinder immediately in dangerous areas or if it can cause interference. Furthermore, it should not be used in the vicinity of, for example, medical equipment, fuels and chemicals, or in blasting areas. Mobile devices may cause interference that can affect performance. Transformers and very strong magnetic fields must be avoided. Otherwise, deviations in the transmission may occur. Failure to observe these instructions may result in interference or damage to the STRATOfinder.

6.6 Cleaning

WARNING! RISK OF DAMAGE!

Below you will find information and instructions on how to clean the STRATOfinder:

- Do not use aggressive cleaning agents or brushes for cleaning. Do not treat the STRATOfinder with metallic cleaning objects (e.g. knives, metal sponges). This can damage the surface.
- Never put the STRATOfinder in water, in a dishwasher (or similar) and do not use a steam cleaner.

Correct cleaning of the STRATOfinder:

1. The surface may be wiped with a damp cloth.
2. The STRATOfinder should then be wiped completely dry.

NOTE! Improper handling of the STRATOfinder can lead to damage.

6.7 Dangers for children and persons in need of assistance

Please do not allow the STRATOfinder to be used by persons (including children) with reduced physical, sensory or mental capabilities. An exception to this rule is if you have received instructions on how to use the device from a person responsible for their safety. Take care not to play with small parts (e.g. accessories, etc.). This can be swallowed and lead to choking. Therefore, teach your child about the dangers and the operation of the STRATOfinder. The STRATOfinder is not considered a child's toy.

6.8 Storage

If you are not going to use the STRATOfinder for a long period of time, switch it off by removing the SIM card. Then place the STRATOfinder in its original packaging or in a box of the same size. Protect the STRATOfinder from dirt and moisture. Keep it out of the reach of children.

6.9 Disposing of packaging

Dispose of all packaging material and the packaging separately. Put paper, cardboard and carton in the waste paper collection and foil in the recyclables collection.

6.10 General information about a stratospheric mission

Stratoflights GmbH & Co. KG does not assume any guarantee or liability for the correctness and up-to-dateness of the information provided here and on all instructions, platforms, websites etc. related to Stratoflights GmbH & Co. KG.

- **Ascent permission:** Please note that the ascent of a weather balloon and thus the execution of your stratospheric mission has to be registered with the authorities and that you are personally liable for the ascent of your weather balloon! Where and how and what information you need to register your weather balloon can be found at your local air traffic control.
- **Aviation liability insurance:** Please note that the ascent of a weather balloon must be insured in most countries. Ask a local insurance agent for the regulations within your country.

7 Checklist: Perfectly prepared and thought of everything?

Here's what you need for a successful stratospheric mission:

☐		Flight permit	In order to launch your weather balloon, you need a flight permit in your country. You can find some basic information about different countries on our website.	
☐		Battery pack	In temperatures as low as -65°C, the camera's internal battery will not last for the entire flight time. You will need a battery pack with power batteries so that your entire stratospheric flight can be filmed.	
☐		Parachute 800	To make sure your payload floats gently and safely back to earth, you need a parachute. The 800 parachute is designed for payloads up to 800g.	
		Parachute 2500	For larger payloads you need a larger parachute. The 2500 parachute is ideal for payloads between 800-2,500g.	
☐		Helium pressure reducer	To fill the calculated amount of helium/balloon gas into your weather balloon, you need a pressure reducer for helium. This allows you to get the right lift for your balloon.	
☐		Suitable launch site	Launch sites such as meadows, parks or your own property are perfect. Make sure there is enough space so that the balloon will hit no obstacles.	
☐		GPS Tracker STRATOfinder	The GPS tracker transmits the exact landing position. A commercially available prepaid SIM card is required.	

☐		Gloves	To avoid „damaging“ the sensitive envelope of the weather balloon, all team members working on the weather balloon should wear gloves and take off rings, earrings, etc. Please avoid contact with the ground!	
☐		Helium/ Balloon Gas	Gas creates the lift. This is available from gas dealers in your region or larger DIY stores / Hardware stores. You can use our helium calculator in the tutorial/ Stratoflights app for the calculation of the correct amount you need.	
☐		Aviation liability insurance	For the flight permit you need an aviation owner's liability insurance. You will find information on this in our tutorial or ask a local insurance agent for the specifications in your county.	
☐		SIM card for GPS Tracker STRATOfinder	To enable the GPS Tracker to send its position via SMS, you need a commercially available prepaid SIM card. Use the best mobile phone network in your country. In Germany, for example, Telekom: D1.	
☐		Space Cam „Apeman“	Reliable camera for extreme conditions. Many cameras and actioncams from well-known manufacturers have problems in the harsh stratospheric conditions. The Space Cam is reliable and delivers great images.	
☐		Special cord	Most countries in the EU require a maximum tensile strength of 230N according to the SERA Law, which is the legal basis for weather balloon ascents in Europe. Our special cord fulfils these criteria of the authorities.	
☐		Polystyrene probe	Your equipment needs to be protected from the extreme conditions to avoid failures. The styrofoam probe offers enough space and protects your equipment against the extreme temperatures of up to -65°C.	
☐		Tesa duct tape	To seal your probe as well as your weather balloon, you need reliable tape. Tesa duct tape is perfect for this purpose.	

The following equipment can be a useful addition to your mission:

☐		Backup-GPS Tracker	As a backup GPS tracker, a second STRATOfinder or SPOT Trace may be useful to provide maximum security.	
☐		Datalogger STRATOfinder	The STRATOfinder is available to unravel the mystery of flight altitude, to obtain information on the flight route and speed, and much more.	
☐		Datalogger STRATO4	In addition to the GPS position, altitude and speed, the STRATO4 also records temperature, air pressure, humidity and much more in order to completely analyse the stratospheric flight.	
☐		SPOT Trace	If a live position is desired or a landing at sea is not unlikely, the GPS tracker SPOT Trace is the perfect choice for a successful stratospheric flight.	
☐		Weather Balloon Handbook	On almost 100 pages with numerous pictures and expert tips, this manual will guide you through the full process of a stratoflight.	

For best results you should have the following tools at hand:

☐		Cutter knife/ scissors	Useful tools to prepare your probe and carefully open the box for the weather balloon.	
☐		Spanner for pres- sure reducer	The gas bottle for the helium/ balloon gas is screwed on with a cap. The cylinder pressure reducer for helium must also be attached.	
☐		Side cutter	Useful to remove the excess of the cable tie.	
☐		Stratoflights app	The App is a helpful tool in your pocket: have checklist, all tools and information ready to hand at the launch site!	

8 About Stratoflights

We hope that we have been able to help you with our weather balloon complete set as well as our other free services such as the Stratoflights App and the tutorials and videos on our website. We hope that you will experience an extraordinary adventure with sensational shots of the blue of our planet.

We are always happy to receive suggestions and constructive feedback as well as reviews of our products in the online shop.

We would also like to take this opportunity to point out that this project can be ideally carried out as a school project, as all scientific disciplines are involved in the overall project and the students are not only introduced to scientific theory and practice with this project, but rather experience a learning experience through the stratosphere flight.

Thank you again for your trust in us and our products! We would be very happy if you recommend this project to others.

Your Stratoflights team

Follow us on Instagram, Facebook and YouTube
and tag us on your project!





www.stratoflights.com