Instruction Manual XC Tracer Maxx II

Brief instructions

Fix the vario on the cockpit or on your thigh. Press the red button and wait until beep-beep, then release the button. At first only the logo appears, after a few seconds the preset screen appears. As long as the vario is searching for GPS satellites, the word GPS will flash in the upper right corner. As soon as a GPS fix is available, the battery symbol is displayed and you can start. You can change the screen by a short push on the button. You can change the volume level by double-clicking on the button. After landing, switch the vario off by pressing the button until you hear beep-beep, then release the button.

If you want to change the settings: press the button twice in quick succession and hold it down for a second on the second click. To get to the desired setting press the button once briefly; with a long press select/change the setting. The vario is preset to beep only when flying. But you can set this as you wish.

If you want to download the tracks or change the configuration file then connect XC Tracer Maxx II to your computer with the included USB-C cable. Now switch on the vario and the SD card of XC Tracer Maxx II will appear on the computer as a USB hard drive. Now you can download tracks, change settings in the config file, or copy new firmware updates to the SD card. The new firmware is installed as soon as you switch off the vario.

Important: Before disconnecting from the computer, please always eject the SD card on the computer.

WARNING: Charge the battery with the USB cable on the PC or on a 5V charger. Only a 5V connection / charger may be used, do not use Fast Charge / Quick Charge / Super Charge / Turbo Power or whatever. If a voltage higher than 5V is used while charging, the electronics will be destroyed. Never use a cheap charger; this can damage your XC Tracer Maxx II.

We accept no responsibility for damage which occurs when not using the correct voltage for charging!

Introduction

XC Tracer Maxx II is a high-precision GPS variometer with a perfectly readable LCD and integrated collision warning using FLARM. XC Tracer Maxx II transmits its position once per second and also the estimated flight path for the next 20 seconds. Other FLARM devices in the vicinity can then draw conclusions about a possible risk of collision. In case of a possible collision the corresponding FLARM device warns the pilot of the other aircraft. XC Tracer Maxx II itself does not warn you of possible collisions with other aircraft.

Many pilots use XC Tracer flight instruments for long XC flights and for competitions. But also for pilots with little flying experience an XC Tracer Variometer is the perfect choice. The lag-free indication of lift / sink rate makes it much easier to find and core thermals than when using a conventional variometer. All essential flight information is displayed on the LCD.

XC Tracer Maxx II is also an IGC logger – the IGC files are approved by the FAI for paragliding competitions. XC Tracer Maxx II has a built-in lithium-polymer battery, fully charged the battery is good for at least 60 hours of continuous operation. The battery is charged via the supplied USB-C cable. The device also has a Bluetooth module. Using Bluetooth Low Energy 4.2, data such as airspeed, altitude, climb, course etc. can be transferred to a mobile phone, tablet or e-reader. Please check xctracer.com to see which apps need to be configured with which BLE strings.

Mounting

XC Tracer Maxx II uses data from a 9-DOF IMU (9 Degrees Of Freedom Inertial Measurement Unit), from the GPS and from a pressure sensor, to compute the real-time climb rate and altitude, avoiding the undesired time lag that conventional variometers suffer from (due to data filtering). For this reason mount your XC Tracer Maxx II in such a way that it moves as little as possible in relation to the harness during flight.

It is therefore important that the XC Tracer Maxx II is firmly attached to the cockpit or thigh with the velcro provided. Mounting on the riser is not ideal.

Important – leave 4-5cm free space around your vario; otherwise the performance of the FLARM / FANET beacon may be compromised.

Switch On/Switch Off

The XC Tracer Maxx II is switched on by pressing the red button until a "beep-beep" is heard. Then release the button and the XC Tracer Maxx II will start up. After switching on, the battery charge level is indicated acoustically. At first only the logo appears, after a few seconds the preset screen appears. As long as the vario is searching for GPS satellites, the word GPS flashes in the upper right corner. As soon as there is a GPS fix, this lettering disappears and the battery symbol is displayed. Now you can start. You can change the screen by a short push on the button. You can change the volume by double clicking on it. After landing, switch off the vario by pressing the button until you hear a beep-beep and the vario is switched off.

Battery Indicator

After switching the device on the battery charge status is indicated with a sequence of short beeps:

5x Beep means that the battery is charged 95% or more.

4x Beep means that the battery is charged 75% or more.

3x Beep means that the battery is charged 55% or more.

2x Beep means that the battery is charged 35% or more.

1x Beep means that the battery is charged 15% or more.

When the battery is less than 15% charged you will hear a constant beep for one second after switching the device on. The battery charge level is also displayed on the LCD.

Adjusting The Volume

XC Tracer Maxx II has 4 volume settings: Mute, very gentle, gentle, medium and loud. You can change the volume level by double pressing the red button (like a double click on the mouse of your computer), always from mute – very gentle – gentle - medium – loud – mute – very gentle etc.

Power management

A fully charged battery from the XC Tracer Maxx II is sufficient to run the vario for up to 70 hours, including logging of IGC and KML files, sending and receiving of FLARM Beacons, data transfer over BLE etc. After successful landing the vario should be switched off to save power. If the landing has failed and medical assistance may be needed, the vario should not be switched off to support a possible search by rescue services.

The battery can be charged via the USB port. To do this, use the USB-C charging cable provided and charge the XC Tracer Maxx II overnight. Fully charging an empty battery takes about 5 hours.

WARNING: Charge the battery with the USB cable on the PC or on a 5V charger. Only a 5V connection / charger may be used, do not use Fast Charge / Quick Charge / Super Charge / Turbo Power or whatever. If a voltage higher than 5V is used while charging, the electronics will be destroyed. Never use a cheap charger; this can damage your XC Tracer Maxx II.

We accept no responsibility for damage which occurs when not using the correct voltage for charging!

Automatic shutdown

The XC Tracer Maxx II does not switch off after landing. The vario must always be switched off manually. The idea behind this is that in case of an accident the vario is not switched off automatically, so that FLARM and FANET signals are still transmitted for as long as possible, which can be used by the SAR services to track and find you. The XC Tracer Maxx II has a low voltage protection and switches off if the battery voltage drops below 3.3V.

Therefore, it is advisable to always turn off the variometer manually immediately after landing.
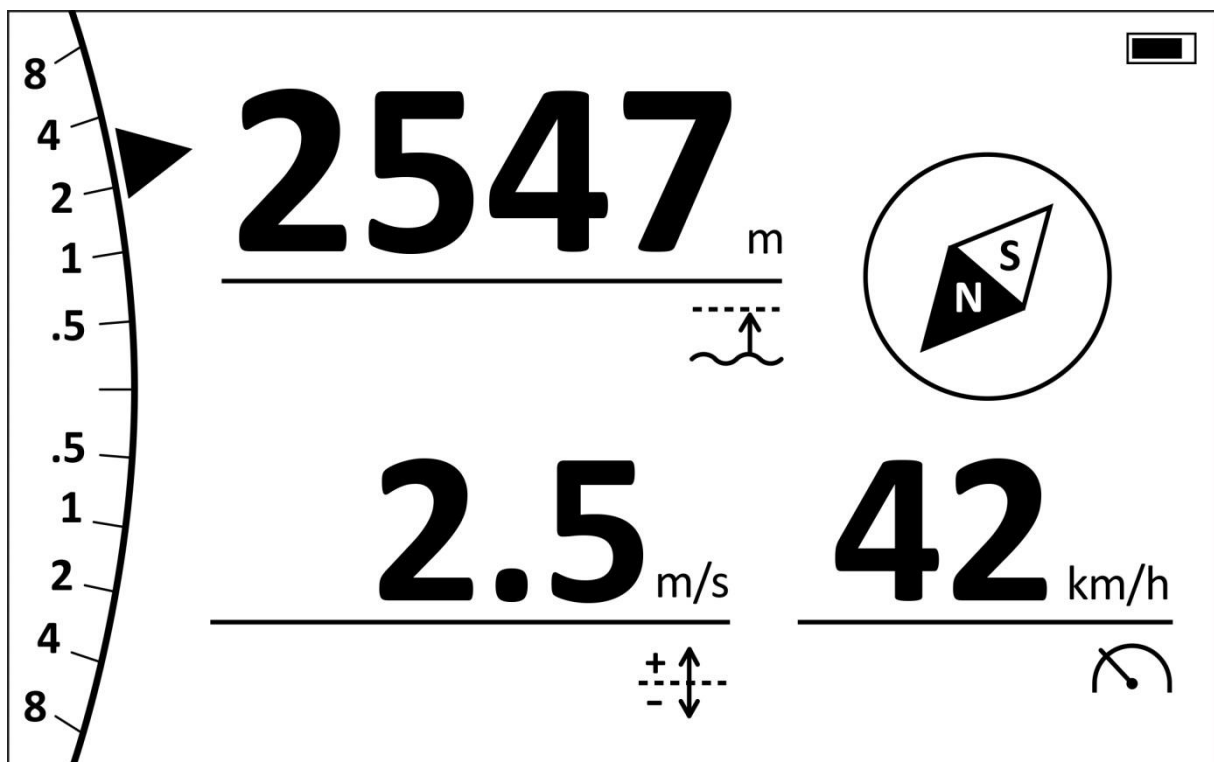
Screens

XC Tracer Maxx II can display several predefined screens:

- Simple
- Standard
- Thermal
- Buddy
- Airspace

The predefined screens cannot be customized except in a very limited way, however it is possible to define which screens should be displayed in flight.

Simple

This is the ideal screen if you don't want too much information displayed. The analogue vario indicator shows you the climb/sink rate in weak thermals with a high resolution, but you can also read the climb rate in strong thermals without any problems,

The digital vario shows the average climb rate, you can set the averaging time. The average climb rate is also shown in the analogue vario display as a triangle which is not filled.

Height is height above sea level, or height above ground, or both.

Speed shows the speed over ground.

And the compass always shows you where north is. Please do not use this feature to fly in clouds or in foggy conditions.
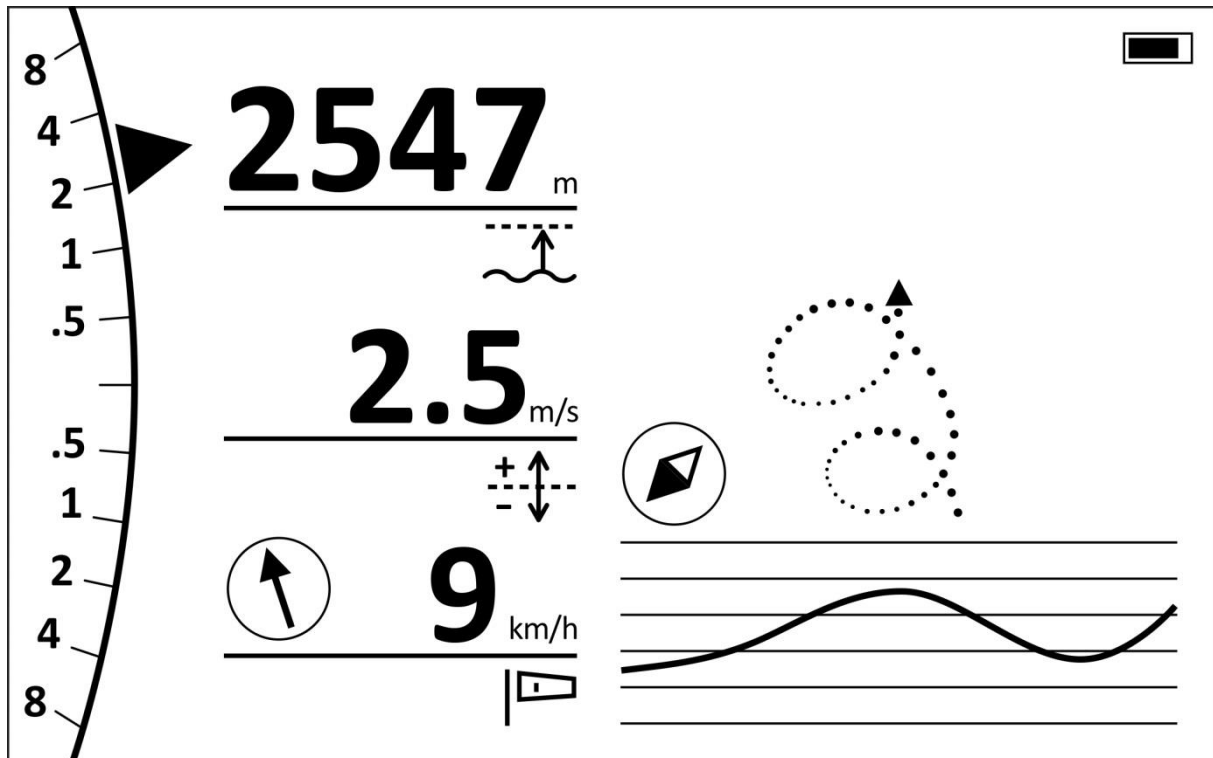
Standard
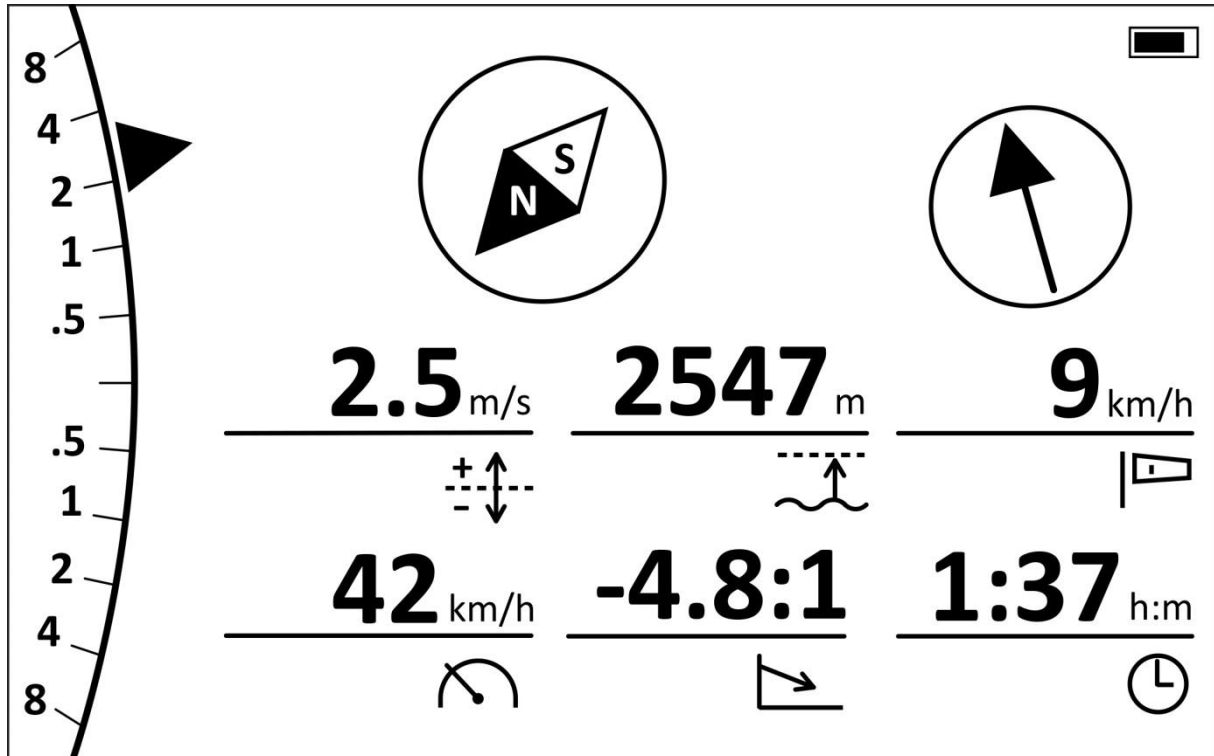
The standard screen will be the ideal screen for many pilots.

The displays are exactly the same as in the simple screen.

In addition to the Simple Screen, the Standard Screen also displays the glide ratio, as well as the current flight duration and/or the current time.

The wind is also displayed. If the wind arrow is pointing upwards it means that the code cannot calculate the wind. But as soon as the wind can be calculated, the wind is displayed, i.e. the arrow shows where the wind is blowing to. Even when soaring on a slope, XC Tracer Maxx II can calculate the wind. The calculation of the wind usually works very well, but there can also be situations where this is not the case.

Thermal

The analog vario display, as well as altitude, digital vario, wind and compass are displayed exactly the same as on the standard screen.

In the settings you can choose whether or not to automatically switch from the standard screen to the thermal screen and back. If you set automaticSwitchScreens=yes, the vario will automatically switch from the standard screen to the thermal screen and back – ie. the vario will notice if you are flying in a thermal or if you are on glide.

On the bottom right you can see the altitude curve of the last 30 seconds. This display can be very helpful to see at a glance whether you have gained or lost altitude. A short look at the screen is enough to know immediately what is going on without having to read numbers or remember numbers.

The thermal assistant displays the last 60 seconds of flight with dots. The dots show, depending on whether they are filled or not, or whether they are large or small, how the climb / sink rate was at that point. Large black dots indicate good climb, large circles indicate strong sinking.

This thermal assistant can be very helpful if you have fallen out of a thermal and want to find it again. But please always keep an eye on the airspace around you and don't keep looking at the screen, however helpful it may be. It is best to try the thermal assistant when you are flying alone in a thermal.

Buddy
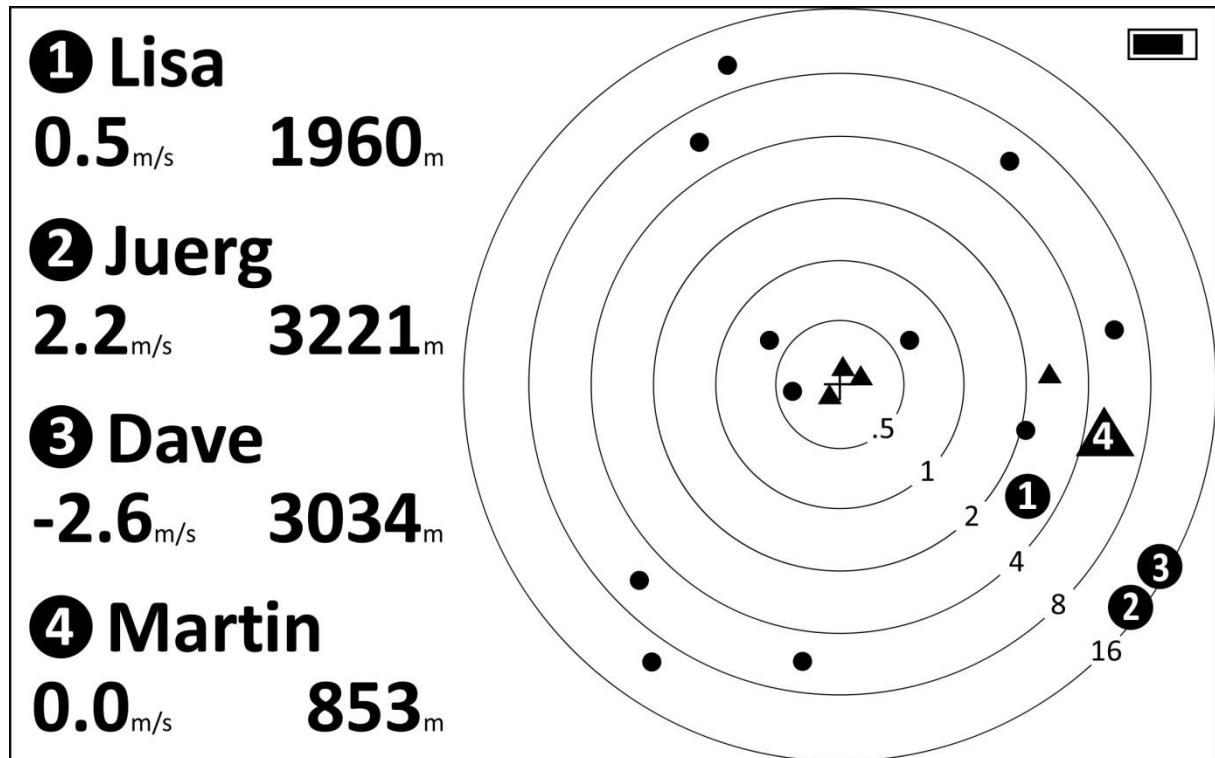
On the Buddy Screen you can see all paraglider and hang glider pilots who fly with a FLARM / FANET device and have been received by the XC Tracer Maxx II in the last 5 minutes. Your position is in the middle of the circles, and from one circle to the next the distance (in kms) doubles.

The dots show paragliders or hang gliders that are equipped with FLARM that are flying, and the triangles show pilots with FLARM that have not yet taken off or landed.

In the buddy list you can define the radio ID and associated names of up to 50 buddies, and then select up to 8 buddies from which you want to know where they fly - see in the example Lisa, Juerg, Dave and Martin. These buddies are represented as large dots or triangles. The altitude and climb of your buddies is displayed. So you are always in the picture where your buddies are.

You can also add a buddy at the take-off – this can be done with a few clicks with the red button. You will find more information on the next page.

If you have more than 4 buddies defined, the info for the first 4 buddies will be displayed for 10 seconds, then info for buddies 5-8 will be displayed for 10 seconds, then again buddies 1-4 will be displayed etc.

It is important to know that position, altitude and status (flying or not) of your buddies will be stored in the vario continuously. This can be helpful to know where to start searching for a buddy in extreme cases. This info can be found in the settings under SAR (Search And Rescue) Buddy. You can find more about how to change or view the settings without using a computer on the next page.
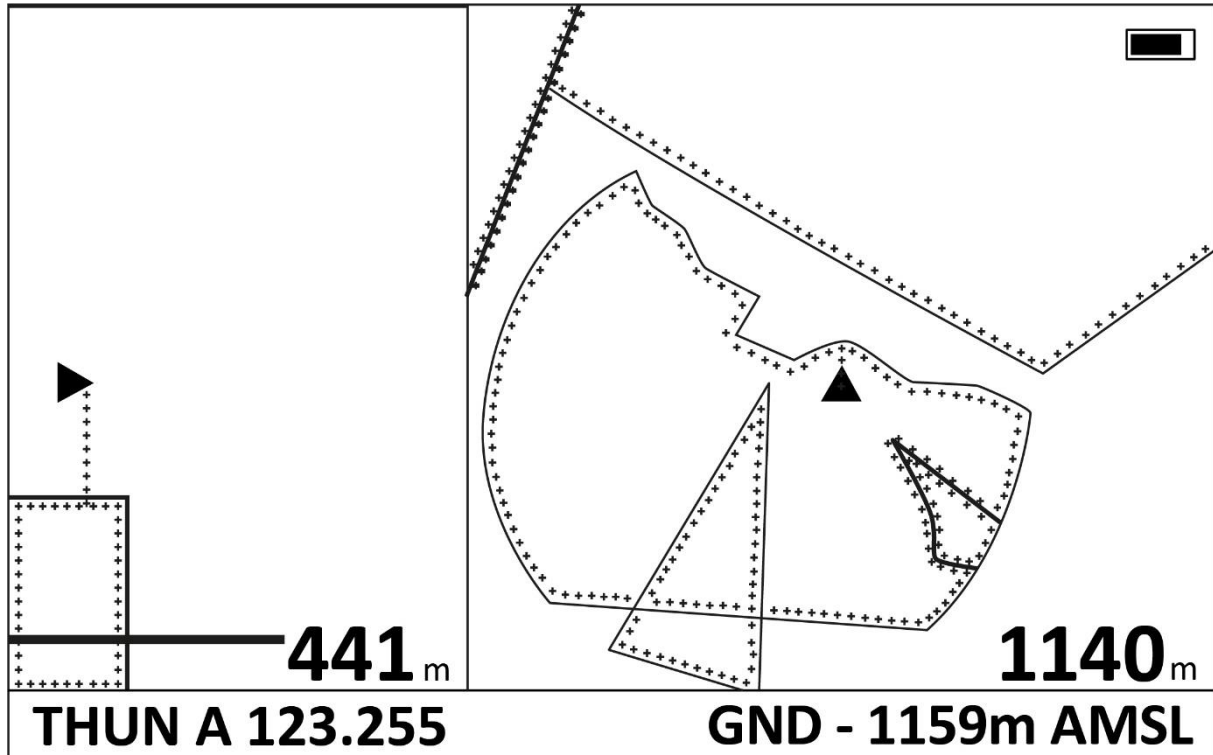
Airspace

643m   **5.1**km

LS-D18 THUN   **GND - 1499m AMSL**
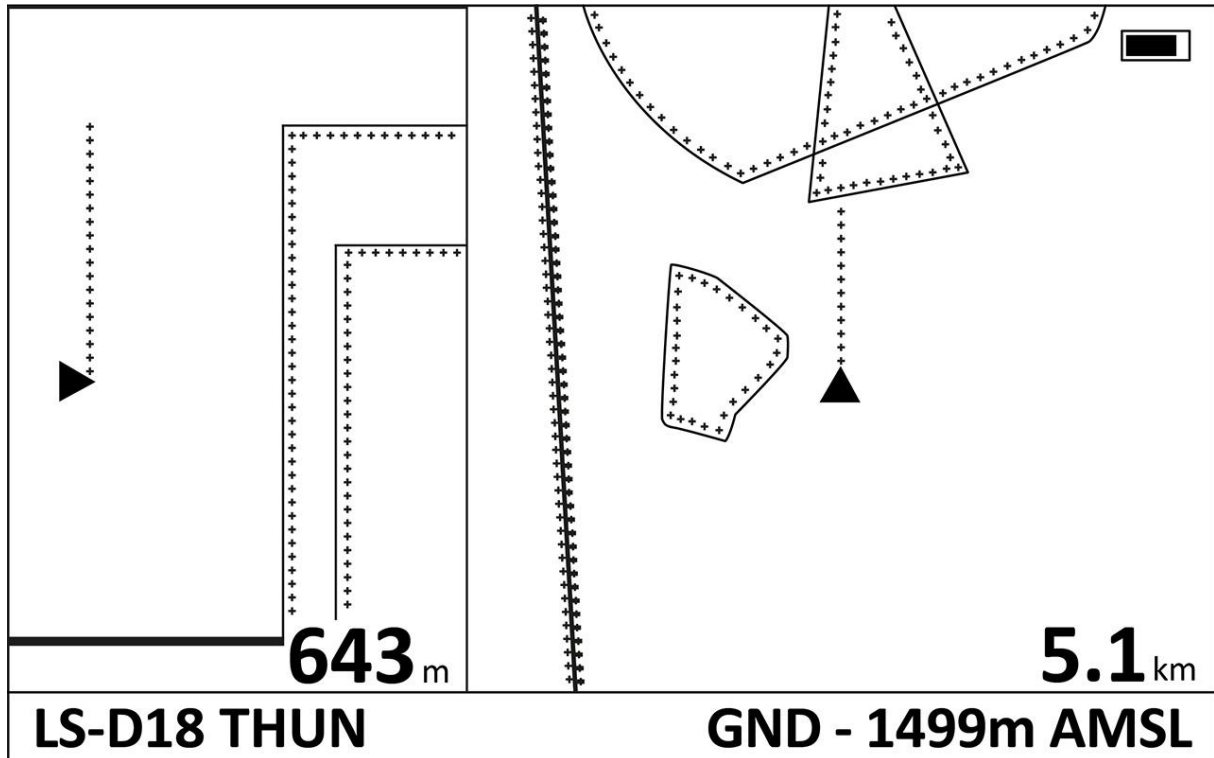
This is what the airspace screen from the Maxx II looks like when flying towards an airspace. On the left is the side view, on the right is the top view. The numbers indicate the vertical distance to the next airspace on the left, and the horizontal distance to the next airspace on the right.

-303m   **-1142**m

THUN A 123.255   **GND - 1159m AMSL**
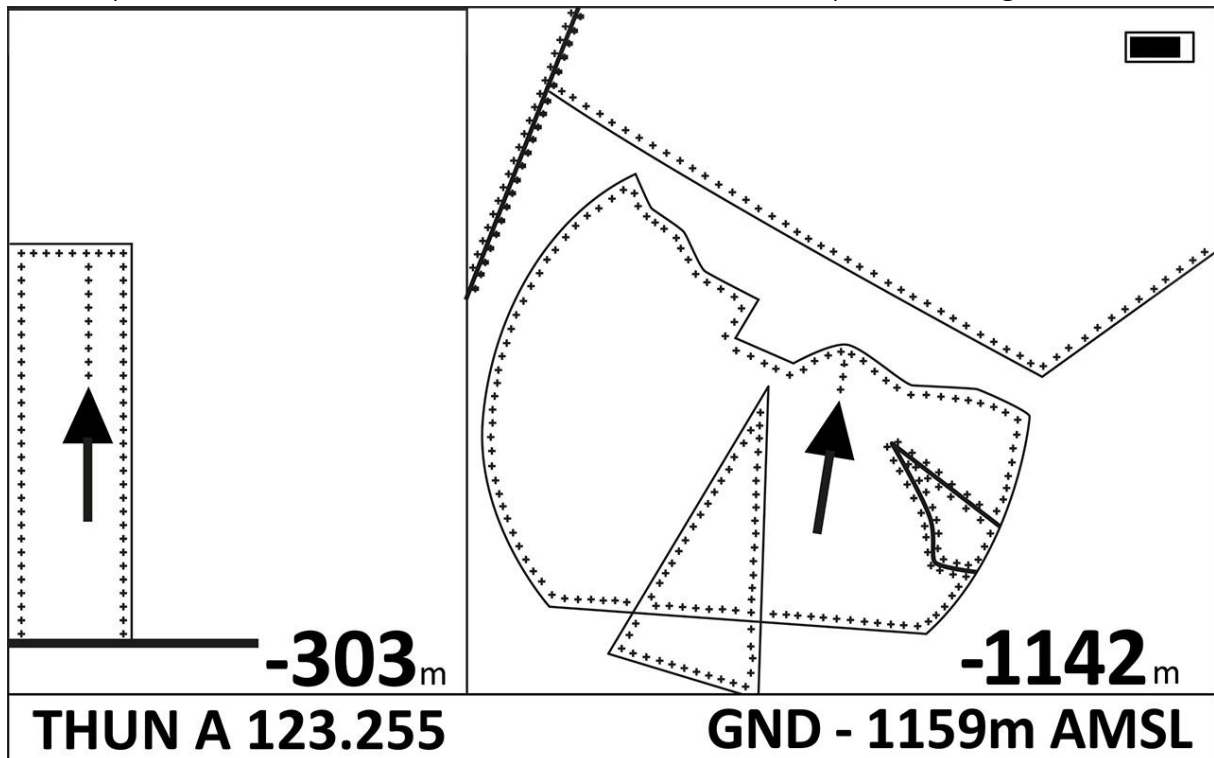
If you are inside an airspace, the two arrows indicate the shortest way out of the airspace. The displayed distance is then the vertical / horizontal distance to the airspace boundary.

This is what it looks like when you are above an airspace.

The airspaces can be downloaded from airspace.xcontest.org in XC Tracer format. Save the file with the name airspaces.bin in the folder Airspace.

Various settings for the airspaces can be made in the menu:

With *TopViewResolution* the size of the map section can be defined.

With *SideViewResolution* the scaling of the side view can be defined.

With *AlarmDistanceHorizontal* a horizontal alarm distance can be defined.

With *AlarmDistanceVertical* a vertical alarm distance can be defined.

With *AwareDistanceHorizontal* a horizontal prewarning distance can be defined.

With *AwareDistanceVertical* a vertical prewarning distance can be defined.

AwareShowTime can be used to set how long the airspace screen should be displayed in case of an early warning.

If you are approaching an airspace and the distance falls below the *AwareDistance*, an acoustic signal will sound and the airspace screen will be displayed for the time defined in *AwareShowTime*. This time span should be set so that you have enough time to get an idea of the situation. After *AwareShowTime* has expired, the display automatically switches back to the previous screen.

In case of an airspace alarm, the system automatically switches to the airspace screen. To return to the previous screen, either the red button must be pressed, the remote control must be operated, or, if active, it must be switched back with Single / Double Tap.

Under Tone & Alarm you can set how often the same airspace should be warned.

Change settings without a computer

If you want to change or view the settings: press the button twice in quick succession (like a double click on a computer) and hold the second click for roughly one second. To get to the desired setting press the button once briefly; with a long press select/change the setting.

The following settings are available in the menu:

Flight Book

Here you can see information about your last flights.

Buddy & FANET / Collision Avoidance

Here you can add or remove buddies, or in the worst case search for a buddy.

With *Add Buddy Nearby* you can add a buddy you don't know at the launch site. Turn on XC Tracer Maxx II and the vario of your buddy, wait until both varios have GPS reception and you can start. *Add Buddy Nearby* shows all FANET devices within a radius of 50m around you that are not yet registered on your device. Navigate to the device ID of the buddy with short clicks, then select this ID with a long button press. The ID of the buddy is now saved, and you cannot select it anymore. Optionally you can also change the name of the buddy during this process.

If you want to give a buddy a different name than for example Buddy3, you can do this afterwards on the computer by changing the name of the buddy in BuddyList.txt.

Under *Add Buddy From Adress Book* you can select a buddy from the list stored in the Buddy folder under *BuddyList.txt*. When you add a buddy with Add Buddy Nearby, it will automatically be saved in BuddyList.txt. For example, you can save up to 50 buddies from your club in this list. At the starting place you can then quickly select up to 8 buddies with Add Buddy From Address Book that are also at the starting place. You can see immediately if a buddy is already flying or if he has not started yet. Condition is that this buddy has switched on his flight instrument with FANET / FLARM.

Under *Remove Buddy* a buddy can be removed, i.e. it is no longer displayed on the screen. However, the buddy is not removed from the *BuddyList.txt*.

Under *Search / Rescue Buddy* you can check where your 8 buddies selected to be displayed on the screen were the last time XC Tracer Maxx II received a FANET signal. This can be helpful in quickly locating a missing pilot during search and rescue operations.

The remaining entries are self-explanatory.

Airspace

Here you can modify settings for the airspaces, see above.

Screens

Here you can select which screens should be displayed, in which order. Important: The automatic switching from and to the thermal screen only works if the thermal screen is selected as Screen2.

Screen Options

Here you can make various settings for the screens. Just try it out, then you will understand best what can be set.

Tone & Alarm

Here you can make various settings regarding sound and alarm. The obstacle warning is currently not yet implemented.

Logger & Tracking

If you do Hike & Fly and want to record the track on the ground as well you have to set LogOnyWhenFlying=no. With LiveTracking=yes you are visible on the OGN / Glidertracker / Burnair.

Device Info

Here you can find various information about the vario like firmware version, RadioID, RadioFirmWareVersion etc.

Exit

From here you come back to the screen you use for flying.

XC Tracer Maxx II Configuration File

A few settings cannot be made directly on the vario. To change them, you have to connect XC Tracer Maxx II with a USB-C cable to a computer, and only then switch on the vario by briefly pressing the red button. Now XC Tracer Maxx II is active in USB mode. The SD card appears in the Windows Explorer or in the Finder of the Mac. The operating instructions are stored on the SD card as a PDF and the configuration file with the name XC_Tracer_Maxx II.txt. In this file the variometer can be adapted to the personal needs. The individual setting options are described below:

XC Tracer Maxx II Configuration File

serialNumber= 688D2E4C8100

Serial number of XC Tracer Maxx II, is used for the IGC logger.

RadioID=2000CA

Radio ID von FANET

RadioFirmwareVersion=7.07-0.9.54

Version of radio firmware

RadioExpireDate=20231201

Expiry date of the radio firmware

firmwareVersion=XC_Tracer_Maxx II_R01

Indicates the device's firmware version.

reset=no

Setting *reset=yes* resets XC Tracer Maxx II to the factory default settings. Reset=no is the default setting. After a reset reset=no will automatically be set in the config file.

 # supported protocols are None, XCTRACER, LK8EX1, LXWP0 or LXWPW.

Select the BLE protocol her. NB. Only one protocol can be selected at once. Please check at www.xctracer.com which protocol to choose for your app. LXWPW is like LXWP0, but with the information of the calculated wind.

stringToSend=LXWP0

In this case the LXWP0 protocol will be will be used.

name of BLE service

bleName=XCT

A name for the BLE service can be assigned here, up to 14 numbers and letters are possible. Please do not use a hyphen, some Android Apps have problems with it.

logger configuration

pilotName=Koni Schafroth

Enter your name here. Please don't use accidentally use any tabs as they will invalidate the IGC file. Spaces are fine.

passengerName=

You can enter the name of a tandem passenger here if you like.

gliderType=Gin Explorer

Enter your glider make and model here.

gliderId=14049

Enter the immatriculation number (if you have one) of your glider here.

 # create your own vario tone settings below

ClimbToneOnThreshold=0.2

With this setting the vario will begin to beep when the climb rate is higher than 0.2m/s. When you want to use a thermal sniffer then you can set *ClimbToneOnThreshold=-0.5* for example. In this case the vario will begin to beep when the sink rate is less than -0.5m/s. In this way you can adjust the beeping tone so that you know when you're flying in lifting air, despite the fact that you're actually sinking gently. This can be helpful to find and core thermals in weak conditions.

ClimbToneOffThreshold=0.1

With this setting the vario will stop beeping when the climb rate is below 0.1m/s. You can also use negative values here, for example -0.51m/s when you use a thermal sniffer.

SinkToneOnThreshold=-3.0

The sink tone will be activated when the sink rate is below -3m/s.

SinkToneOffThreshold=-3.0

The sink tone will be deactivated when the sink rate is less than -3m/s.

tone=-10.00,200,100,100

tone=-3.00,280,100,100

tone=-0.51,300,500,100

tone=-0.50,200,800,5

tone=0.09,400,600,10

tone=0.10,400,600,50

tone=1.16,550,552,52

tone=2.67,763,483,55

tone=4.24,985,412,58

tone=6.00,1234,332,62

tone=8.00,1517,241,66

tone=10.00,1800,150,70

You must define exactly 12 tones. Additional tones will be deleted from the configuration file, and missing tones will be complemented with values stored in the Eeprom. The tones must be defined ascending from tone 1 of -10m/s to tone 10m/s of tone 12.

Important: Please avoid using exactly the same climb rate on adjacent tones as it will create issues.

tone=1.16,579,527,50 means that with a climb rate of 1.16m/s the vario will beep with a frequency of 579Hz, that the complete tone interval will last 527ms, and that the tone will be audible for 50% of the tone interval. This is a typical tone that is used when indicating climbing.

tone=-3.00,280,100,100 means that with a sink rate of -3.0m/s a tone of 280Hz will be emitted. As soon as the sink rate changes the tone frequency also changes, depending on the configuration. This creates a nice sink tone (not that a sink tone is ever nice!)

You can create your own tone settings using the tone simulator on xctracer.com and then copy and paste them to the configuration file, or you can simply copy and paste other people's tone settings into the configuration file.

Important: Always close the configuration file before you unmount / eject XC Tracer Maxx II!!!
Important: Always save and close the config file before switching off the XC Tracer Maxx II!

Important: Before switching off the vario, please always eject the SD card from the computer. This also applies to firmware updates!

Important: After changing the config file, the XC Tracer Maxx II must be switched on in flight mode so that the settings of the config file are applied and saved in the eeprom.

Radio Firmware / Update

The radio firmware must be updated annually. In the settings you can check which firmware version is installed and until when this firmware is valid.

After this expiration date, the radio firmware will no longer work with FANET / FLARM! An update must be done before this date!

Please check xctracer.com if a new radio firmware (*.efw file) is available. These firmware updates are free of charge, the installation is easy by drag & drop. For instructions on how to perform a firmware update, see below.

Collision warning

XC Tracer Maxx II transmits once per second the position and also the estimated trajectory for the next 20 seconds. All other FLARM devices in the vicinity can use this information to estimate a possible collision risk. If another FLARM device determines that a collision is possible, it warns the pilot of the other aircraft.

XC Tracer Maxx II itself does not warn of possible collisions with other aircraft!

XC Tracer Maxx II can receive signals from FANET devices of paragliders and hang gliders and transmit the data to a cell phone, tablet or e-reader. Depending on which app you use, you'll always know where your buddies are. During flight tests under optimal conditions, signals were received from FANET devices up to 140 km away.

XC Tracer Maxx II Firmware Update / How to read flight data

Connect XC Tracer Maxx II to a computer using a USB-C cable and once connected, switch the device on by briefly pressing the red button until you hear a beep-beep-beep. XC Tracer Maxx II is now running in USB-MSD (Mass Storage Device) mode. XC Tracer Maxx II's internal Micro SD Card will appear as an external drive in Windows Explorer or the Mac Finder. Download the newest flight firmware for XC Tracer Maxx II and the newest FLARM firmware from xctracer.com and copy the new firmware using drag and drop to the SD card. Now press the red button briefly and the new firmware will start to be installed.

When the XC Tracer Maxx II firmware (*.iap file) is updated, after a short time a few ascending beeps sound, the firmware file is deleted from the SD card and the vario switches off. The new firmware is now installed.

An update of the FLARM firmware takes much longer, after pressing the red button it will last 1-5 minutes until a few ascending beeps will sound, the FLARM firmware file or obstacle database file will be deleted from the SD card and the vario will turn off. The new version is now installed.

Important: The information about the firmware version will only be updated once the device has been started up in normal flight mode. Only one update at a time. If you want to update 2 files you have to repeat the process.

It's impossible to install incorrect firmware on the XC Tracer Maxx II – all that happens is that the incompatible firmware will get deleted from the SD card.

Troubleshooting

In the rare event that XC Tracer Maxx II doesn't respond when you push the red button, you can perform a hard-reset by pressing and holding the red button for approximately 1 minute. The battery will then get disconnected from the electronics. After that you can restart XC Tracer Maxx II in flight mode, and the device will be functional again.

Handling

A variometer is a sensitive device, the electronics, the sensors and the LCD display can be damaged by strong impacts or shocks. Handle your instrument with care!! Please only expose the vario to the sun during the flight, otherwise the instrument can become very hot. This can cause the battery to overheat and destroy the battery and the vario! The LCD can also be damaged by excessive heat or a lot of UV light. The vario is not waterproof.

Warranty

XC Tracer grants a 24 month warranty for material and workmanship. Unsuitable or improper use (for example strong impact, water landing, opened enclosure, software modification, ripped off USB connector, broken lcd etc.) and normal wear and tear (scratches in the enlcosure, degradation of the battery) are excluded from the guarantee.

Technical Specification

- High-resolution B&W LCD, 536x336 pixels, perfectly readable
- Hardened and glare-free glass for LCD protection
- Five different screens selectable, from simple screen to air spaces
- Simplest operation
- Legendary sensitive vario technology, with no time lag
- FLARM with transmission data
- Open source obstacle database (not yet implemented)
- FANET display of position and height of Buddies
- Internal broad band antenna, works worldwide
- Data transmission via BLE to mobile phone/tablet/E-reader
- IGC and KML Logger, approved by the FAI for competitions
- Many compatible apps for Android/iOS
- Freely configurable sound settings with our tone simulator
- Accelerometer/Compass/Gyro/Baro/GPS/BLE/FLARM
- Running time with full battery at least 60h
- Firmware update via drag & drop
- Running time with full battery up to 70h
- Size: 92x68x18 mm
- Weight 120g
- CE and FCC Certification
- Swiss Made

FCC Statement:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC ID: 2AVOQ02 / Contains FCC ID: XPYANNAB