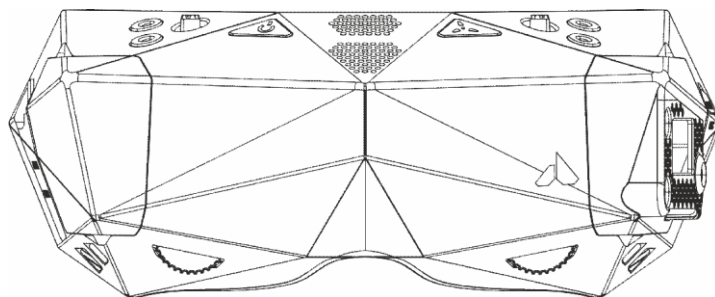




FPV VIDEO GOGGLES

FPV.ONE



User Manual

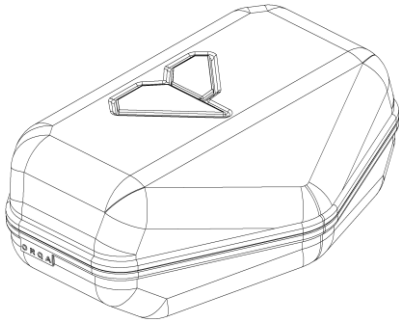
Rev. 1.2 | December 2019.

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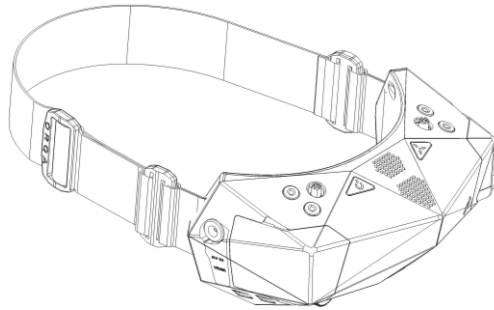
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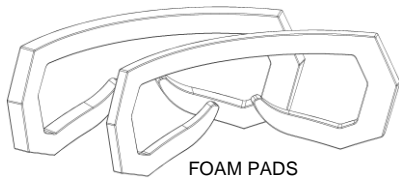
PACKAGE CONTENTS



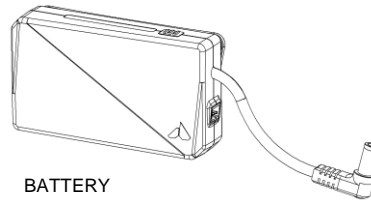
CARRYING CASE



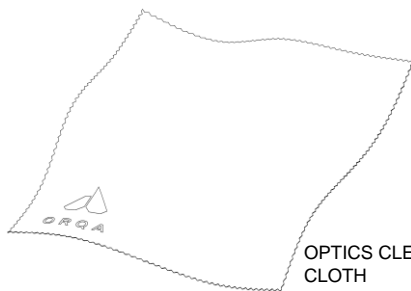
GOGGLES



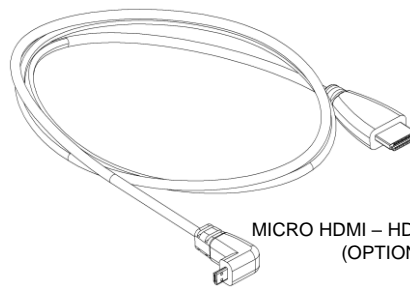
FOAM PADS



BATTERY

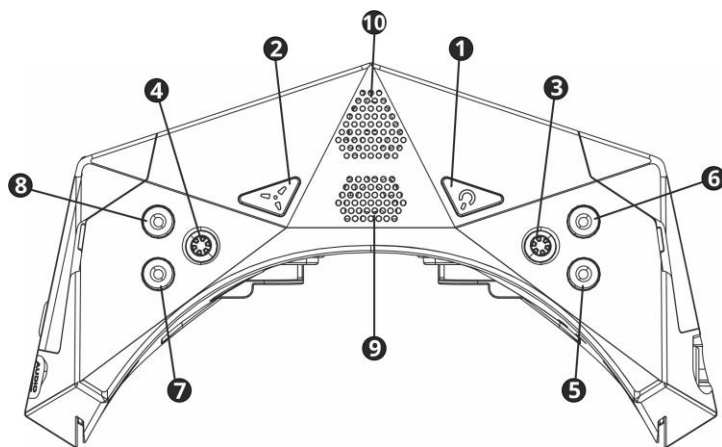


OPTICS CLEANING CLOTH



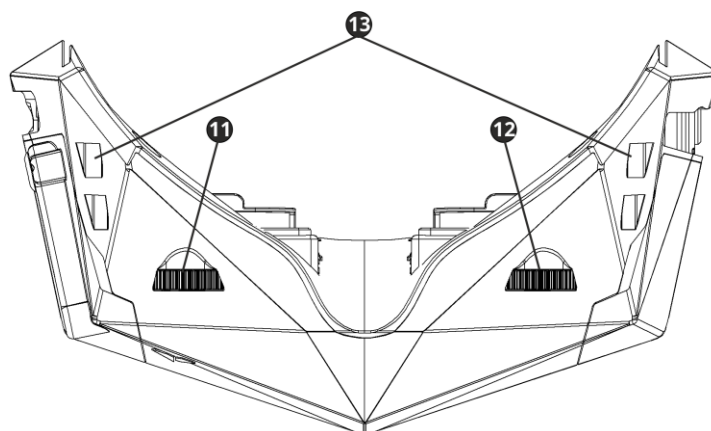
MICRO HDMI – HDMI CABLE
(OPTIONAL)

GETTING TO KNOW THE GOGGLES

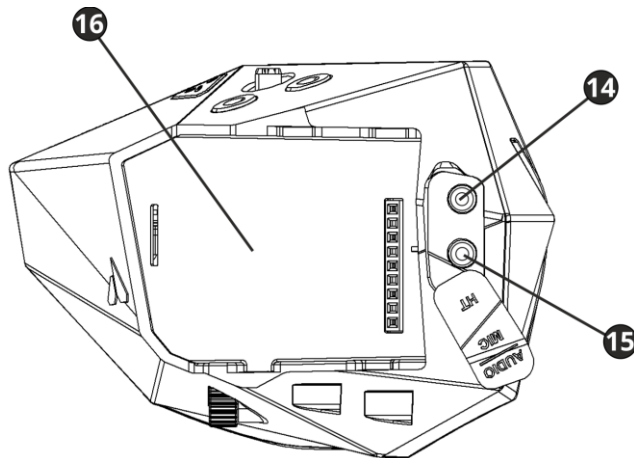


1. Power On/Off
2. Defogging Fan
3. Right Menu Navigation
4. Left Menu Navigation
5. Battery Check
6. DVR Quick Record
7. Channel Down
8. Channel Up
9. Defogging Air Intake
10. Cooling Air Exhaust

11. Left IPD Adjust Wheel
12. Right IPD Adjust Wheel
13. Cooling Air Intake

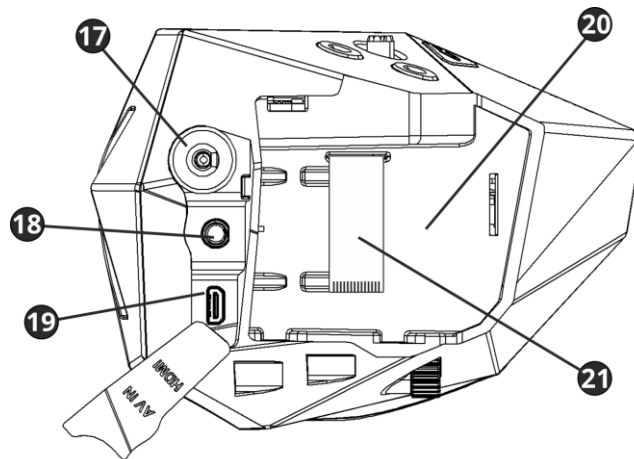


GETTING TO KNOW THE GOGGLES



- 14. Audio Out / Mic In
- 15. Head Tracker Output
- 16. Receiver Bay

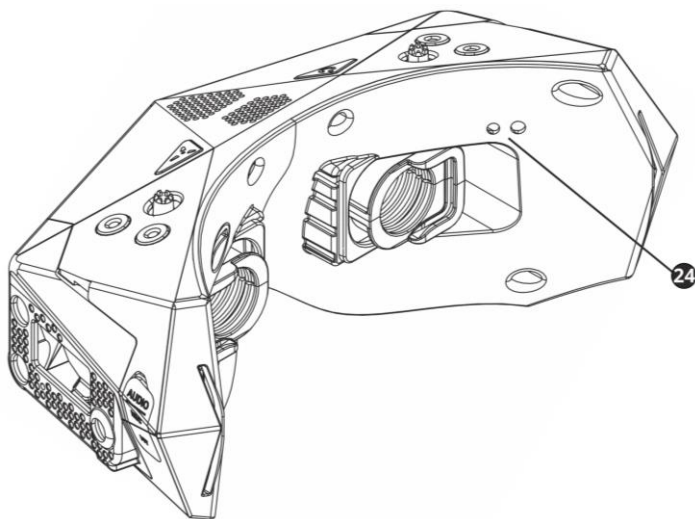
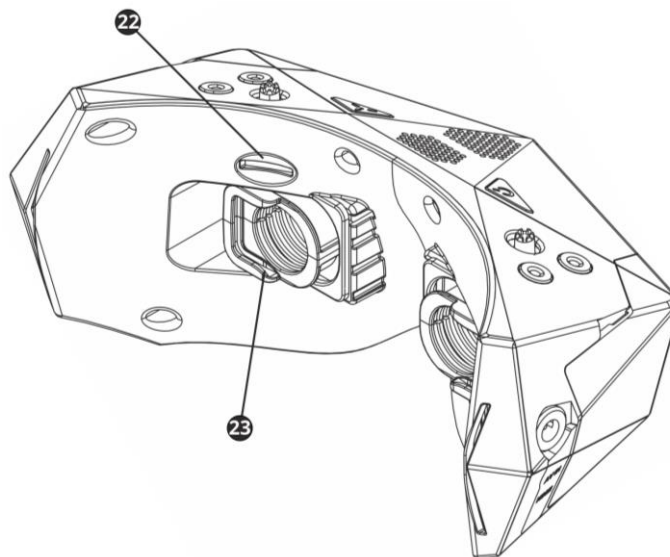
- 17. Power Connector
- 18. AV Input
- 19. MicroHDMI Input
- 20. Secondary Bay
- 21. Module Interface FFC



GETTING TO KNOW THE GOGGLES

22. Micro SD Card Slot

23. Diopter Slot



24. Stand-By Sensor

CONTROLLING THE GOGGLES

Power Button



Press the Power Button to power the goggles On or Off **1**.

There are different power-on modes. Check page 13 for more information.

Fan Button



To prevent the lenses from fogging due to high humidity or sweat, use the defogging fan. Press the Fan Button to turn the fan on or off **2**.

Right-hand Joystick



Use the Right-hand joystick to access the DVR menu **3**.

Left-hand Joystick



Use the Left-hand Joystick to access the main menu **4**.

Battery Check



Press the Battery Check Button to show the battery status **5**.

DVR Quick Record



Press the DVR Quick Record Button to start/stop recording with DVR **6**.

Channel Down



Press the Channel Down Button to change the receiver channel down **7**.

Additionally, long press this button to change the receiver band.

Channel Up

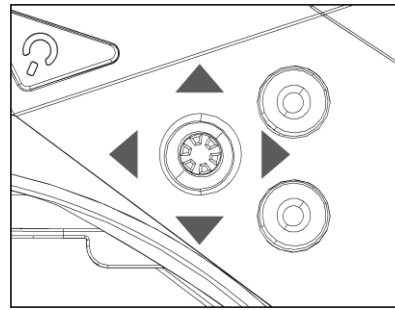
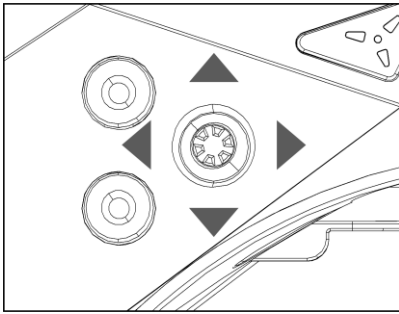


Press the Channel Up Button to change the receiver channel up **8**.

Additionally, long press this button to change the receiver band.

NAVIGATING THE MENUS

There are two main menus that are accessible via the two corresponding joysticks on the top side of the goggles.



The Left-hand joystick **4** controls the main menu. The main menu incorporates all the main controls and goggles settings.

The Right-hand joystick **3** controls the additional menu which is used mainly to adjust the Digital Video Recorder and Video Playback settings.

To enter the main or additional menu simply press the corresponding joystick.

Once inside the menu move the corresponding joystick up, down, left or right in order to select the required setting.

Confirm/save the set value by pressing the corresponding joystick.

To exit the menu, move the joystick to the left or wait for 10 seconds to automatically exit the menu.

Changes will be saved only if the menu is closed before turning the goggles off.

RECEIVER SETTINGS

In this menu, you can select the receiver module that you have installed into the main receiver module bay.

In order to control the different receiver modules directly from the goggles, it is important to select the receiver module that you are using.

Also, by selecting the correct module the goggle's OSD and module's OSD will work together without conflicting with each other.



For example, if RapidFire is selected, you will be able to change the channel by short pressing the CHANNEL UP **8** or CHANNEL DOWN **7** buttons on the goggles.

A long press on the CHANNEL UP **8** or CHANNEL DOWN **7** buttons changes the band on the receiver module.

Additionally, by entering the channel table in the menu you can select the desired frequency of the RapidFire receiver module.

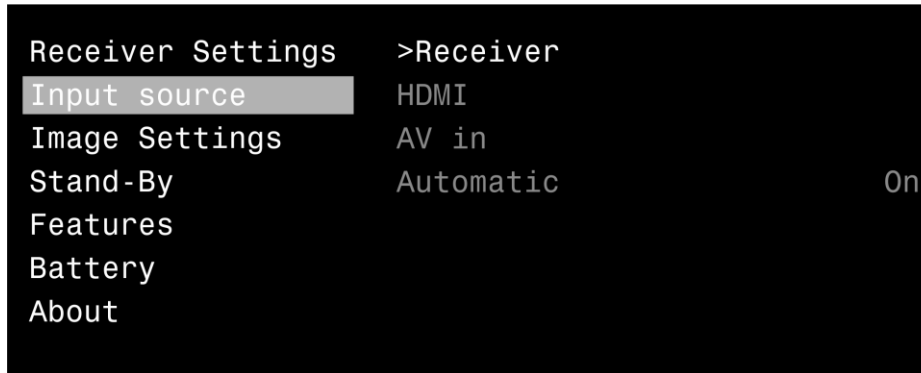
Please note that RapidFire firmware must be updated to at least version 1.3. to have the full functionality with the Orqa goggles.

| | CH 1 | CH 2 | CH 3 | CH 4 | CH 5 | CH 6 | CH 7 | CH 8 |
|---|------|------|------|------|------|------|------|------|
| I | 5740 | 5760 | 5780 | 5800 | 5820 | 5840 | 5860 | 5880 |
| R | 5658 | 5695 | 5732 | 5769 | 5806 | 5843 | 5880 | 5917 |
| E | 5705 | 5685 | 5665 | 5645 | 5885 | 5905 | 5925 | 5945 |
| B | 5733 | 5752 | 5771 | 5790 | 5809 | 5828 | 5847 | 5866 |
| A | 5865 | 5845 | 5825 | 5805 | 5780 | 5765 | 5745 | 5725 |
| L | 5333 | 5373 | 5413 | 5453 | 5493 | 5533 | 5573 | 5613 |

INPUT SOURCE

INPUT SOURCE is used to set the goggles video input source.

You can select between: Receiver, HDMI, AV in and AUTOMATIC.



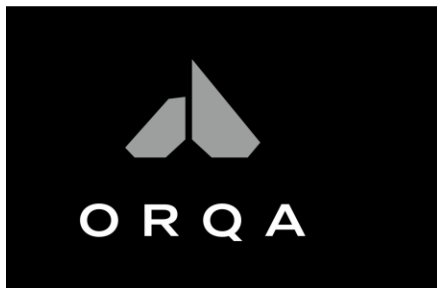
AUTOMATIC setting will bring up the image from the input you feed to the goggles.

When automatic mode is on, the default setting is Receiver, but as soon as you plug in another source it will automatically switch to that input.

If an HDMI source with an unsupported signal is connected, the “Unsupported HDMI Input” message will appear on-screen.

Automatic setting priority

1. HDMI
2. AV in
3. RX



▲ Please note that the splash screen with the Orqa logo will be displayed if there is no valid input signal present.

IMAGE SETTINGS

IMAGE SETTINGS are used to adjust Contrast, Brightness, Color, Aspect Ratio and Supersize.

You can access the image settings via the user menu to fine-tune the image.

| | | |
|-------------------|------------------|-----|
| Receiver Settings | >Contrast | 50% |
| Input source | Brightness | 50% |
| Image Settings | Color | 50% |
| Stand-By | Aspect Ratio | 4:3 |
| Features | Super Size | Off |
| Battery | Reset To Default | |
| About | | |

When adjusting Contrast, Brightness, and Color, the OSD will disappear and the progress bar will pop-up. Where you can change the setting between 0 and 100 by moving the left-hand joystick **4** left and right.

In order to just make some quick changes to the basic image you can move the left-hand joystick **4** :

1. up and down to adjust the brightness
2. left and right to adjust the contrast

In order to make quick adjustments to the color move the right-hand joystick **3** left and right.

With the ASPECT RATIO setting you can choose between the 16:9 and 4:3 image ratio. Adjust this setting to best fit your image source.

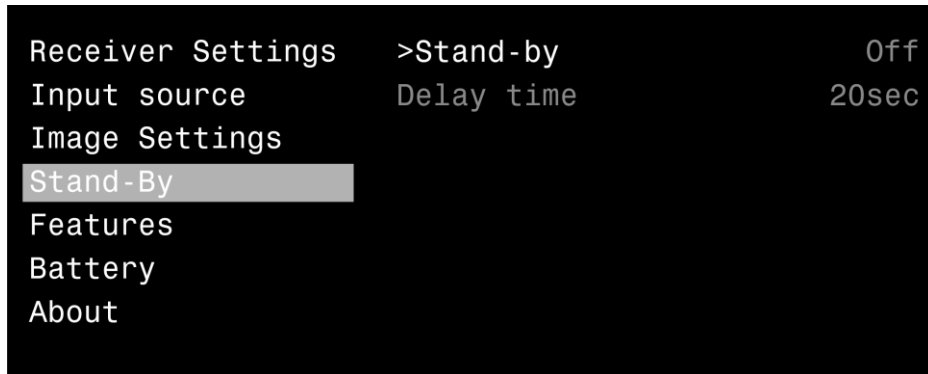
SUPER SIZE, due to large FOV some of the users can experience pincushion distortion on the edges of the image. To counter that, the system crops some pixels in the corners of the screen. The SUPER SIZE setting is for users, who want to use 100% of the screen.

The RESET setting is used to reset all the parameters of the image to their factory-set values.

STAND BY

The goggles feature the “Stand-By” option which helps to save the battery.

When the Stand-By mode is activated the goggles will go into the stand-by when they are taken off the head.



In order to have the Stand-by mode function properly make sure that the stand-by sensor is not obstructed by the face pad foam.

To activate the Stand-by mode set it to On. The goggles will enter the stand-by after the set delay time has passed.

The default delay time setting is 20 seconds, and it can be adjusted in steps of 10 seconds to a maximum of 240 seconds.

Once the goggles are put back on, they will automatically turn back on.

Please note that the Stand-by function will turn off only the microdisplays and the receiver installed in the main receiver bay. The rest of the system will stay powered on.

FEATURES

FPV.ONE goggles are equipped with various features and settings for a better overall user experience.

| | | |
|-------------------|-----------------|--------|
| Receiver Settings | >Head Tracker | Off |
| Input source | Set zero point | |
| Image Settings | Head tilt alarm | Off |
| Stand-By | Angle | 35 |
| Features | Power Button | Mode 2 |
| Battery | Button Sound | On |
| About | | |

- The **HEAD TRACKER** feature uses goggles' integrated IMU to track the movement of the pilots' head. This feature requires the IMU to be reset every time this feature is used. This is achieved by scrolling to the "SET ZERO POINT" and by depressing the left-hand joystick **4**.

If the camera on the aircraft starts to drift (IMU was not calibrated), press the "**SET ZERO POINT**" again.

- The **HEAD TILT ALARM** is used to help the pilots aim the directional antenna. Especially long-range pilots need to keep the antenna pointed exactly in the direction of their aircraft to achieve greater distances. This feature is also helpful for the pilots who tends to drop their head while flying.

To set this feature change the setting in the menu to ON. The angle is set both up and down from set zero point. The angle value can be set between 15° and 45°. If the pilot's head tilts up or down more than the set angle the beeping sound will be heard.

- The **POWER BUTTON MODES** setting is used to set the desired way you turn on/off your goggles.

There are 3 power-on modes:

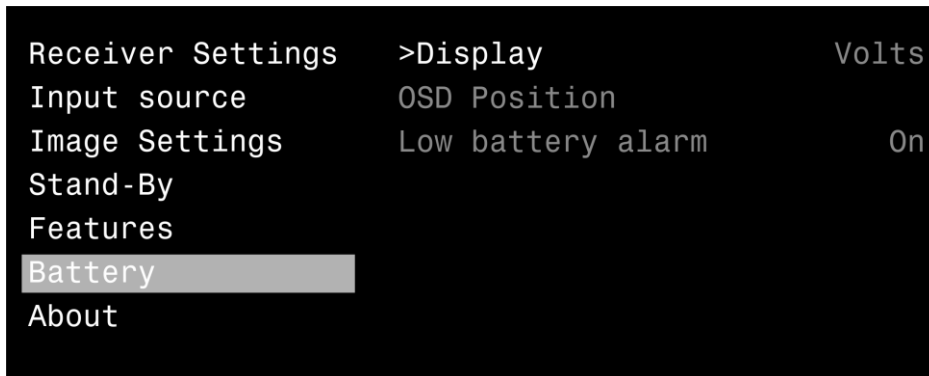
- Mode 1: SINGLE PRESS
- Mode 2: ONE SHORT - ONE LONG press
- Mode ALWAYS ON

In the ALWAYS ON mode goggles are powered ON/OFF by plugging or unplugging the power source (battery) to the goggles.

- The sound feedback can be switched on or off with the **BUTTON SOUND**.

BATTERY

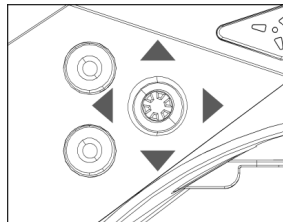
When flying, one of the most important things is to know your battery status. The goggles can show the battery charge level on-screen and notify you when the battery voltage is low.



There are a couple of options to set up how the battery information is displayed.

In the Battery >Display menu you can choose whether the battery charge level is showed in “Volts” or in Percentage. In normal use, to display the battery status simply press the “Battery check” **5** button.

Additionally, you can choose where on the screen the battery info will be displayed. To adjust the position, enter the “OSD Position” menu and then position the battery info on the screen by moving the left-hand joystick up-down and left-right. Once you are satisfied with the position, confirm the setting by depressing the left-hand joystick **4**.



The goggles can alarm you when the battery is low. If the battery voltage drops to 6.55V (which is about 10% of the original Orqa battery capacity) the goggles will notify you with three short beeps and the battery voltage (or percentage) will be displayed in red color on the screen. The audible alarm will be repeated every 60 seconds.

To turn the Low battery alarm on, change the setting to ON.

ABOUT

In the “About” screen you can see some important information about your goggles.

| | | |
|-------------------|------------------|-----------------|
| Receiver Settings | Date/Time | 4.Nov '19 18:32 |
| Input source | Factory reset | |
| Image Settings | | |
| Stand-By | Up time | 1h 12m |
| Features | Firmware version | 1.0.0 |
| Battery | Hardware version | 1.0.0 |
| About | ID | FPV11844022 |

To set up the **Date/Time** press the left-hand joystick and adjust the date and time. Once set, press the left-hand joystick **4** to save and exit this setting.

To revert all the settings to the factory settings, depress the **Factory reset** item on the menu.

Up time shows the total up time of the goggles. This info is automatically stored in the goggles and cannot be reset or changed by the user.

Firmware version shows the current firmware version installed on the goggles. Every time the firmware updates the info will be shown here. It will change the status to updated and show the current version.

Hardware version shows the hardware (electronics) version of the goggles. This info is factory set and cannot be changed by the user.

ID is the unique ID of your goggles. You can use it in case you need to contact the support or register your goggles on ine. Also, you can find it on the sticker with the QR code inside of the secondary module bay and on the packing box.

UPDATING THE FIRMWARE

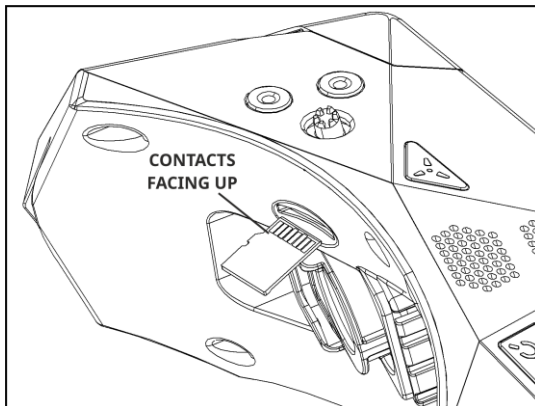
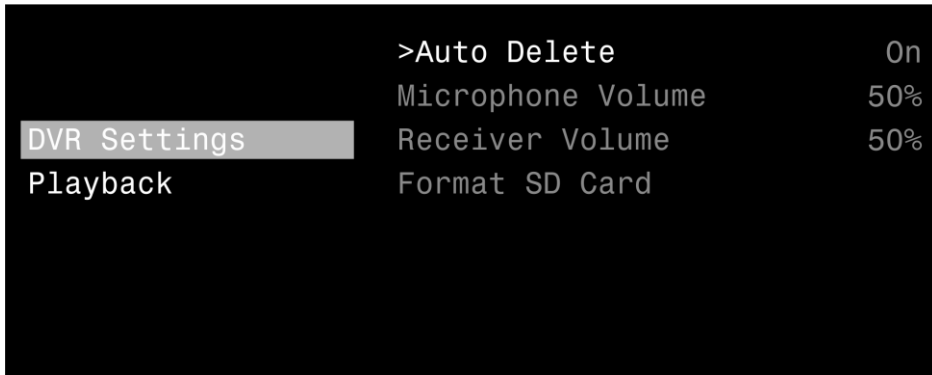
To update the firmware, download the firmware (*.orqa file) from the Orqa website and save it to the root of your micro SD card. Power down the goggles. Insert the micro SD card into the slot located at the faceplate. Power on the goggles and wait for the system to install the new firmware. The progress bar is displayed on screen. After the firmware is updated the goggles will restart automatically. This process can take up to couple of minutes, depending on the size of the update. After the firmware update has finished the system will delete the firmware update file from the micro SD card.

Please note that the update process will not start if the battery voltage is below 7.2V.

The firmware can be either upgraded or downgraded by putting the desired firmware version on the micro SD card.

DVR

Integrated Digital Video Recorder (DVR) enables high definition recording of the video and audio from any of the inputs.



To use the DVR, the micro SD card must be inserted in the dedicated slot in the faceplate.

Insert the micro SD card with the contacts facing up. Inserting the micro SD Card incorrectly might result in getting the card stuck in the goggles.

To start recording, press the “DVR Quick Record” button **6** on the top side of the goggles. The button is marked with the red dot. DVR starts recording instantly from the input that is shown on the screen. During the DVR recording, the red **REC** symbol is blinking in the top right corner of the screen.

Note that DVR will not record any of the goggle's OSD features which might be shown on screen during recording. OSD features generated by a receiver (e.g. RapidFire RSS bars) will be recorded.

DVR

When recording, the DVR saves data onto the inserted micro SD card. Eventually, all the available memory space will be used and there will be no free space for the DVR to store the data. When there is no more available space on the micro SD card, the DVR will stop recording.

In order to prevent the DVR from stopping the recording because of unavailable storage space, the “Auto Delete” option can be used. This option allows the DVR to delete the oldest recorded file on the inserted micro SD Card in order to free some space for the current recording.

Please note that the “Auto Delete” function will delete only the files created by the Orqa DVR system. All other files that might be present on the micro SD card will not be deleted.

When the “Auto Delete” option is turned OFF, the DVR will record until all the available space on the micro SD card is used.

When the available memory space on the micro SD card drops to 30 minutes, the remaining time available will be displayed next to the REC symbol in the top right corner of the screen **30min REC**.

If there is no available memory space on the micro SD card, and you press the “DVR Quick Record” button **6**, the “SD card full” message will appear on-screen.

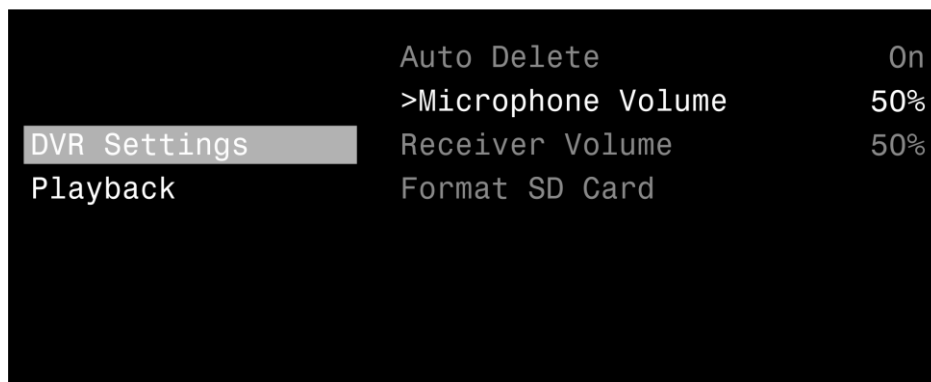
Please note that the DVR saves data in 5-minute-long video files. That means that recording that is longer than 5 minutes will be saved in multiple files. This is to make sure that not a complete recording is lost in case of any problems with data storage or power loss during recording.

If during recording the battery level drops to 6.55V, the REC BAT! will blink in the top right corner. If the battery level is below 6.55V, the DVR will not start the new recording and the “Battery critical” message will appear on-screen.

DVR

The DVR also records audio from any of the inputs.

Additionally, DVR can record audio from an external microphone, when Receiver or AV-In inputs are used. To record microphone audio, plug in the microphone into the 3.5 mm jack on the left side of the goggles. Make sure you have the correct pinout of the 3.5 mm jack. Check the diagram on page 18.



The microphone recording level should be adjusted through the “Microphone Volume” menu. The default level is set to 50%. To adjust this setting, press **3** on the “Microphone Volume” menu item and then move the right-hand joystick **3** right-left to increase-decrease the value. Once set, press the left-hand joystick **3** to confirm and save.

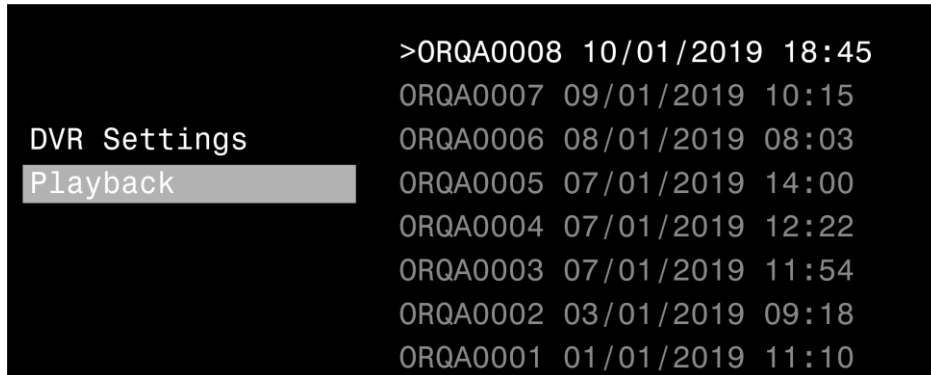
To adjust the audio recording level of the receiver installed in the receiver bay, press **3** on the “Receiver Volume” menu item and then move the right-hand joystick **3** right-left to increase-decrease the value. Once set, press the right-hand joystick **3** to confirm and save. Note that this setting also adjusts the recorded audio volume of the AV-in input.

If you try to start the DVR recording or formatting the SD card without the SD card inserted, the “NO SD CARD” message will be displayed.

Format SD Card is used to fast format the inserted micro SD card to the corresponding FAT system. The system can manage SD Cards up to 2TB.

VIDEO PLAYBACK

To view the recorded video files on your goggles, enter the “Playback” menu.



Here you will find the list of the recorded videos.

The videos are automatically named and sorted by the system based on their creation time/date.

To play the video, scroll to the desired file in the list and press the right-hand joystick **3**. The video starts playing instantly. At the end of the video, the system will return to the file list.

Short press the right-hand joystick **3** to pause/resume the video during playback.

To stop playing the video and return to the file list long press the right-hand joystick **3**.

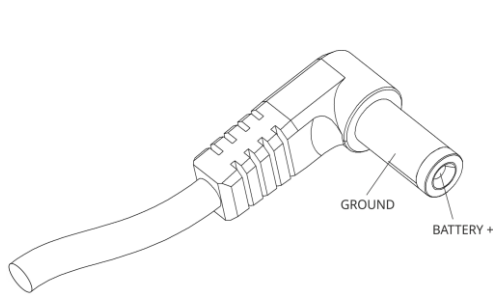
To fast forward the video press the right-hand joystick **3** to the right. The video will skip by 2 to 12 seconds, depending on the total video length.

To revind the video press the right-hand joystick **3** to the left. The video will skip by 2 to 12 seconds, depending on the total video length.

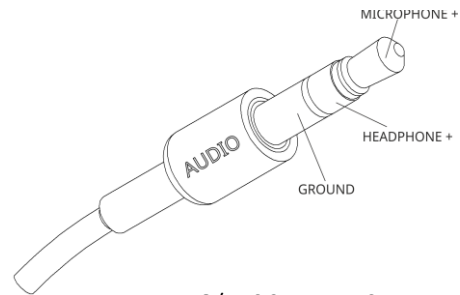
By pressing the right-hand joystick **3** up or down, the video playback speed can be adjusted. For example, to play the video in slow motion, press the right-hand joystick **3** down. To reset the playback speed to normal, quickly pause and resume the playback.

Please note that the system will only recognize and display the files created by the goggles' DVR. Other files which might be present on the micro SD card will not be visible in this list.

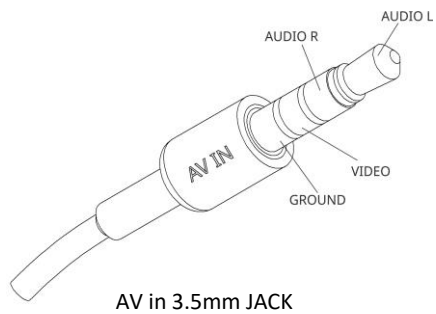
CONNECTIONS PINOUT



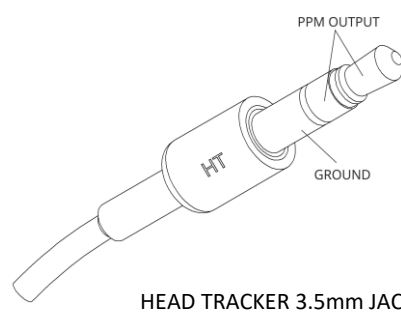
BATTERY CONNECTOR



AUDIO/MIC 3.5mm JACK



AV in 3.5mm JACK



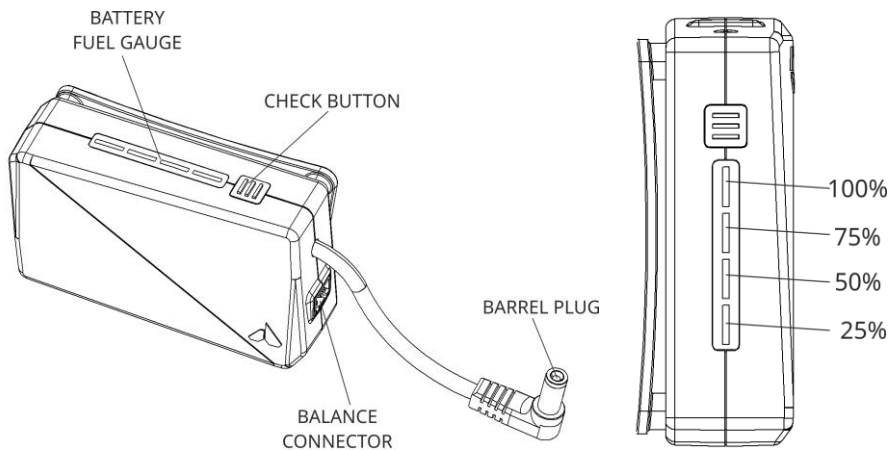
HEAD TRACKER 3.5mm JACK

ORQA ORIGINAL BATTERY

The goggles should be powered by a power source with a voltage between 6.0 and 10.0 VDC. The best way to power your goggles is to use the supplied Orqa Original Battery.

The Orqa Original Battery holds two 18500 Li-ion cells inside connected in 2S configuration. The battery case features the battery fuel gauge. To check the actual battery charge level, press and hold the button on top of the battery. The battery fuel gauge displays the level with four LED-backlit bars. Each bar represents roughly 25% of the full charge. The battery capacity is 2000 mAh.

The battery fuel gauge goes off after 2 seconds even if you are still holding the button pressed. This will prevent the unintended battery discharge if the button gets unintentionally pressed in transport.



Once the battery is empty, it needs to be recharged. To recharge the battery, connect the barrel plug to the Li-ion battery charger.

The battery case features the standard JST 3 pole balance connector. The best practice is to balance charge the battery in order to keep the cell's voltage on the same level. This will ensure the optimal performance and long life of the battery cells.

⚠ WARNING, FIRE HAZARD! ⚠

When transporting the battery ALWAYS plug the balance cable in the balance connector on the battery case. This will prevent the accidental short circuit of the pins in the balance connector. Shorting the balance pins will most probably destroy the battery and could produce FIRE! Always carefully pack your batteries.

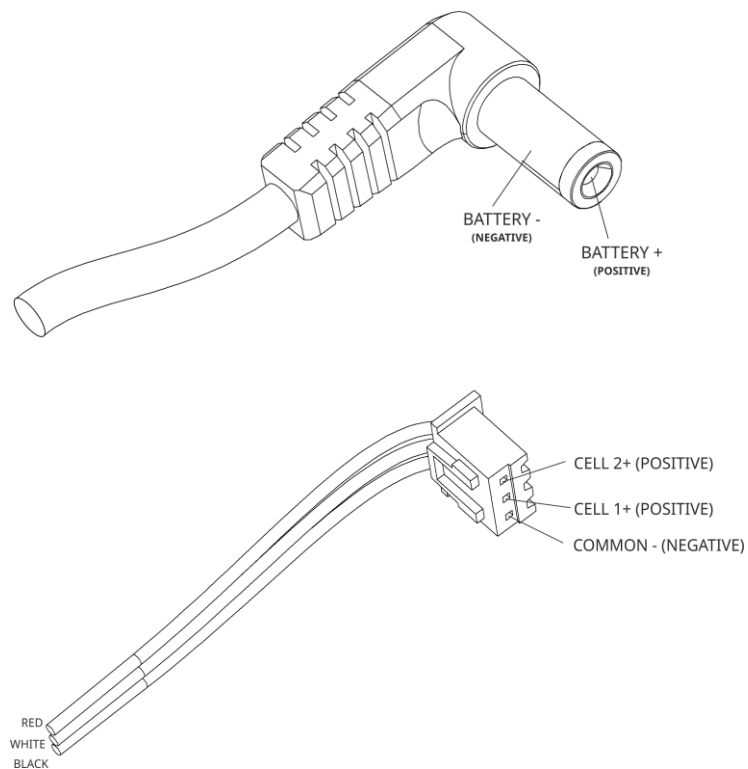
CHARGING THE BATTERY

The Orqa Original Battery should be recharged once the battery voltage is low.

To charge the battery you will need the battery charger with the Li-ion or Li-Po charging profile. The best way to recharge the battery is the “balance charge” option. That means that the charger will make sure that the cells inside the battery will always be charged to the same voltage. Having the cells balanced will ensure the long-time optimum battery performance.

Optimal charging current should be set to 1.0A max. The battery should be fully charged to 8.4V (4.2V per cell). The fully charged battery will have all four bars lit.

The correct battery connectors polarity is shown in the images below.



TECHNICAL SPECIFICATIONS

| | |
|--|--------------------------------|
| ▪ Viewing angle | 44° |
| ▪ Screen resolution | 1280 x 960 pixels |
| ▪ Aspect ratio | 4:3 native or 16:9 (720p) |
| ▪ Power supply | 6-10VDC (2S Li-ion Battery) |
| ▪ Power consumption | 3.3W, typical |
| ▪ Integrated Head Tracker output | 3.5mm jack |
| ▪ HDMI video input | micro HDMI |
| ▪ Battery connector | 2.1 x 5.5mm barrel connector |
| ▪ IPD range | 56-74 mm |
| ▪ Integrated DVR | 1280x960, 50/60fps, H.264, mp4 |
| ▪ Standard receiver bay | High power |
| ▪ Secondary bay for additional modules | 3.3V, SDIO, UART |
| ▪ Weight (without battery) | 232g |
| ▪ Dimensions | 177 x 99 x 72 mm |