USER MANUAL

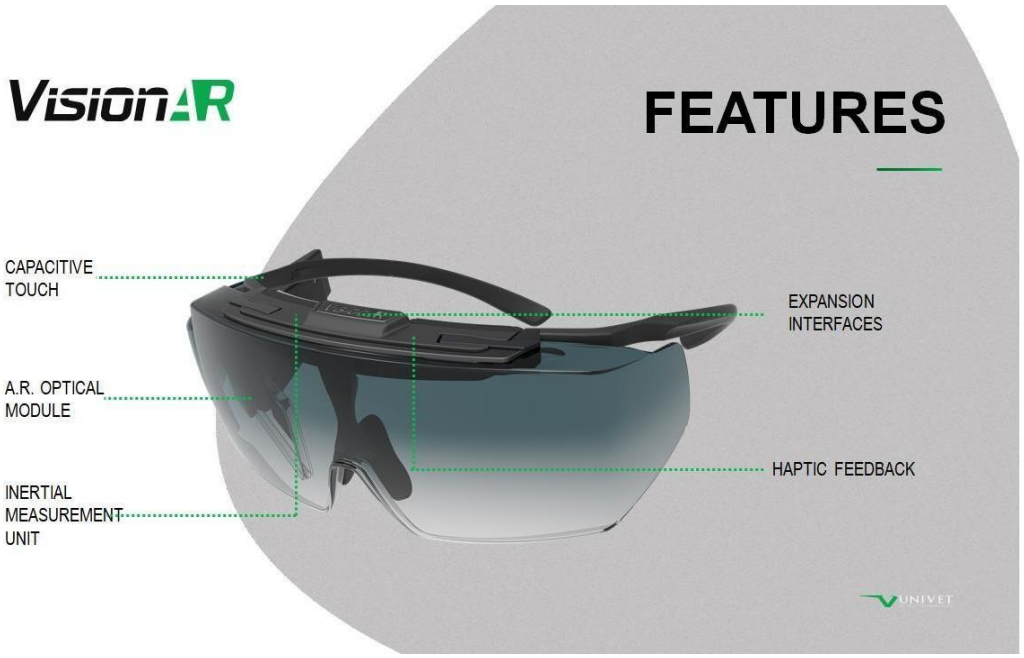
VisionAR

Sommario

1. Smart Glasses Overview

VisionAR offers the following:

a) Capacitive Touch
b) Haptic Feedback
c) AR Optical Module
d) Inertial Measurement Unit
e) Expansion Interface



a) Capacitive Touch

A capacitive touch sensor which can be programmed to be interpreted as

- Tap
- Double Tap
- Forward
- Back

b) Haptic feedback

A haptic feedback can be programmed for signalling an alarm to VisionAR (i.e. vibration)

c) AR Optical Module

The optical module is composed of a transparent display which can be aligned with the field of vision

d) Inertial Measurement Unit

Triaxial accelerometer, gyroscope and magnetometer are on board to detect user's relative position and movement

e) Expansion Interface

The expansion interface allows to increase the functionalities of VisionAR by connecting compatible device (e.g Camera) through standard I2C protocol

2. Smart Glasses Before Starting

Assembling your safety glasses

1. Take the glasses and cables out of the box
2. Fasten the elastic headband to the glasses temples using clips
3. Insert the USB cable into the USB slot on the optical module
4. Lock the USB cable to temples by clip

Disassembling your safety glasses

Make sure that the Control Unit is turned off

1. Un-plug the USB cable from the Control Unit
2. Unlock the USB cable from clip
3. Un-plug the USB cable from the optical module
4. Remove the elastic headband from glasses
5. Remove the lenses by pulling it from the opposite side respect to the Opticalmodule
6. Remove the optical unit by:
    a. Lifting the two metal clips which are present on the top of the VisionAR.
    b. Gently pull the optical unit out of the protective lenses.

3. Smart Glasses - What's in the Box

Opening the VisionAR Smart Glasses box (*Figure 1*), the portable case is immediately visible; all the accessories will be displayed in this page.

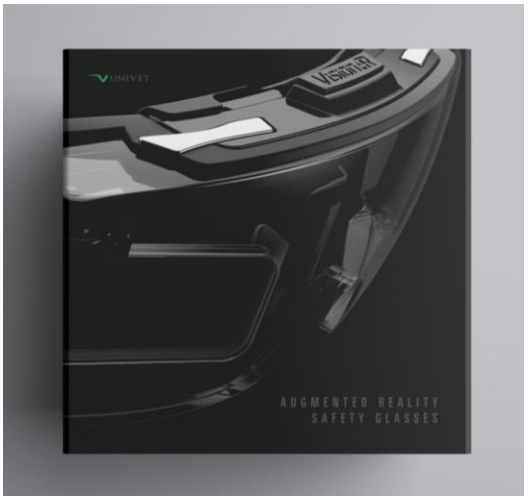


Figure 1: Panoramic of VisionAR Smart Glasses box

Portable case

Inside the box, the portable case has the following content:

- Glasses with Gradient lens mounted
- Spare Clear lens
- Quick User Guide
- Informative Note

Figure 2: Portable case appearance

Figure 3: Portable case content

VisionAR design is illustrated in *Figure 4,* a gradient lens will be mounted as default (*Figure 5*). Spare clear lens is available in the package (*Figure 6*):

Figure 4: VisionAR design, rear view

Accessories

All supplied accessories are shown in *Figure 8*, a dividing layer separates portable case compartment from accessories (*Figure 7*):

Figure 7: Dividing layer

Figure 8: All the supplied accessories

All the accessories

1 Screwdriver
2 Clip
3 USB cable
4 Cleaning cloth and liquid
5 Elastic headband

4. Control Unit Overview

Specs

- Processor (model, number of cores, frequency (rate)); Quad-core: NXP IMX6Q @800MHz
- RAM (capacity): 1 GB
- Built-in memory (capacity): 4 GB
- Use of memory cards: up to 16 GB
- GSM, GPS radio-module
- Wi-Fi std 802.11 b/g/n
- Bluetooth standard 4.2 and BLE connection
- Battery (type, battery capacity, run time on a single charge, recharging time):
  Main battery, 4000 mAh, runtime about 4hrs, recharging time about 4hrs.
  Additional back- up battery: 500 mAh for hot swap.
- Controller availability: four virtual buttons via capacitive touch-pad on the glasses, four physical buttons on the Control Unit.
- Sound (speakers, microphone); only by Bluetooth device

Figure 1: Frontal view of Univet Control Unit

1. Programmable LEDs (see LED lights)
2. USB type C port (see Ports)
3. USB type micro B port (see Ports)

Ports

Two ports are present on the top side of the CU (as indicated in *Figure 1*):

- USB Type C port which is used to connect the glasses to the CU
- USB Type Micro B port to access to CU in Debug Mode

LED Lights

The CU has four LED lights (as indicated in *Figure 1*):

- Status LED
- Bluetooth, Wi-Fi and GSM LEDs

During Control Unit update operations, LED lights behaviour is typical and described in Control Unit Update.

Status LED

Operating system manage Status LED in this way:

- blinking red LED: external battery charge < 20 % and internal battery charge > 50 %
- steady red LED: external battery charge < 20 % and internal battery charge < 50 %
- blinking violet LED: VisionAR smart glasses is not recognized by Control Unit

It is recommended to fix the LED light (e.g. blue color) when application is running. LED light color management is assigned to software application

Note: if the Battery Pack is disconnected from the Contol Unit, the Status LED is steady red

Bluetooth, Wi-Fi and GSM LEDs

The LEDs are programmable and can be turn on through a custom application when modules are active

CU Buttons

Univet Control Unit has different buttons as you can see in *Figure 2:*

Figure 2: Top and Lateral view of Univet Control Unit

1. Power button
2. ESC
3. Up
4. Enter/Confirm
5. Down

5. Control Unit Before Starting

TURN ON/OFF

Here the procedure to turn ON and turn OFF the Univet Control Unit

TURN ON

1. Connect the Control Unit and VisionAR Smart glasses through USB cable
2. Place the Control unit 20cm far from the body
3. Drive the power button up and release

TURN OFF

To turn off the Control Unit:

1. Drive the power button up and hold for 5 seconds. Now you can release the power button verifying that LED lights are not flashing and only red one is on
2. Disconnect the USB cable from the Control Unit and from VisionAR Smart glasses

Remember that the Control Unit can work only when two subunits are connected

6. Control Unit – What's in the box

Figure 1: Panoramic of the Control Unit Box

The contents of the box are listed below:

1. Charger
2. Control Unit with mounted battery pack
3. Spare battery pack
4. Plug adapters

Hidden by the spare battery there is also:

- USB type A to type micro B cable (for charging purpose)

Figure 2: Box contents

7. Control Unit – How to charge the battery pack

Here a panoramic of Univet Control Unit (*Figure 1*):

Figure 1: Panoramic of Control Unit frontal view

1. Status LED
2. Type USB C connector to link Control Unit and VisionAR
3. Type USB micro B connector to link Control Unit and PC for debugging operation
4. Clip for plug in/plug out operation

1) Unhook the clip (*Figure 2 [a]*) of Control Unit bringing it down and split the two subunits (*Figure 2 [b]*) as it is reported in next figures:

Figure 2 [a]: Unhook the clip

Figure 2 [b]: Split the two subunits

2) Check the battery status by clicking on battery pack button, as shown below (*Figure 3*):

Figure 3: Click on battery pack button

3) The number of green spots indicates charging value of the battery pack:

- 1 dot: battery charge between 0 - 25 %
- 2 dots: battery charge between 25 - 50 %
- 3 dots: battery charge between 50 - 75 %
- 4 dots: battery charge between 75 - 100 %

4) Connect the battery pack to the charger with the USB cable, as pointed in Figure 4:

- type micro B interface to the battery pack (A)
- type A interface to the charger (B)

Figure 4: Connection between battery pack (A) and charger (B)

6) Connect the charger to electric socket

7) During battery charging period, a flashing green LED is displayed

8) When charging process ends, green LED is fixed as show here *(Figure 5)*:

Figure 5: Fixed green LED when battery pack is fully charged

8. FCC Compliance

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.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

The Control Unit complies with the FCC(US) radio frequency (RF) exposure limits at 20cm distance to body, when used as intended, described and instructed in the user guidance.

Additional information about RF safety can be found on the links below:
FCC website at https://www.fcc.gov/general/radio-frequency-safety-0