Usage headband and vest in the autonomous mode

Operation instruction

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This instruction is relevant for sets of outdoor laser tag with versions of firmware for the tager - 19.2 and above, for the headband/vest - 5.2 and above.

Starting from these versions of firmware, a player without a tager, but only in a headband or vest, can participate in the game. This feature allows not only to diversify scenarios, but also with a limited number of kits to increase the number of players involved in the gameplay.

The operating instructions can be downloaded at https://lasertag.net/support/manuals by scanning the QR code.

1   Design and operation

1.1   General concepts about the construction of DFI

The headband and/or vest are included in each player's kit and are devices for fixing and indicating hits (DFI). They consist of a textile base, a control unit and hit sensors.
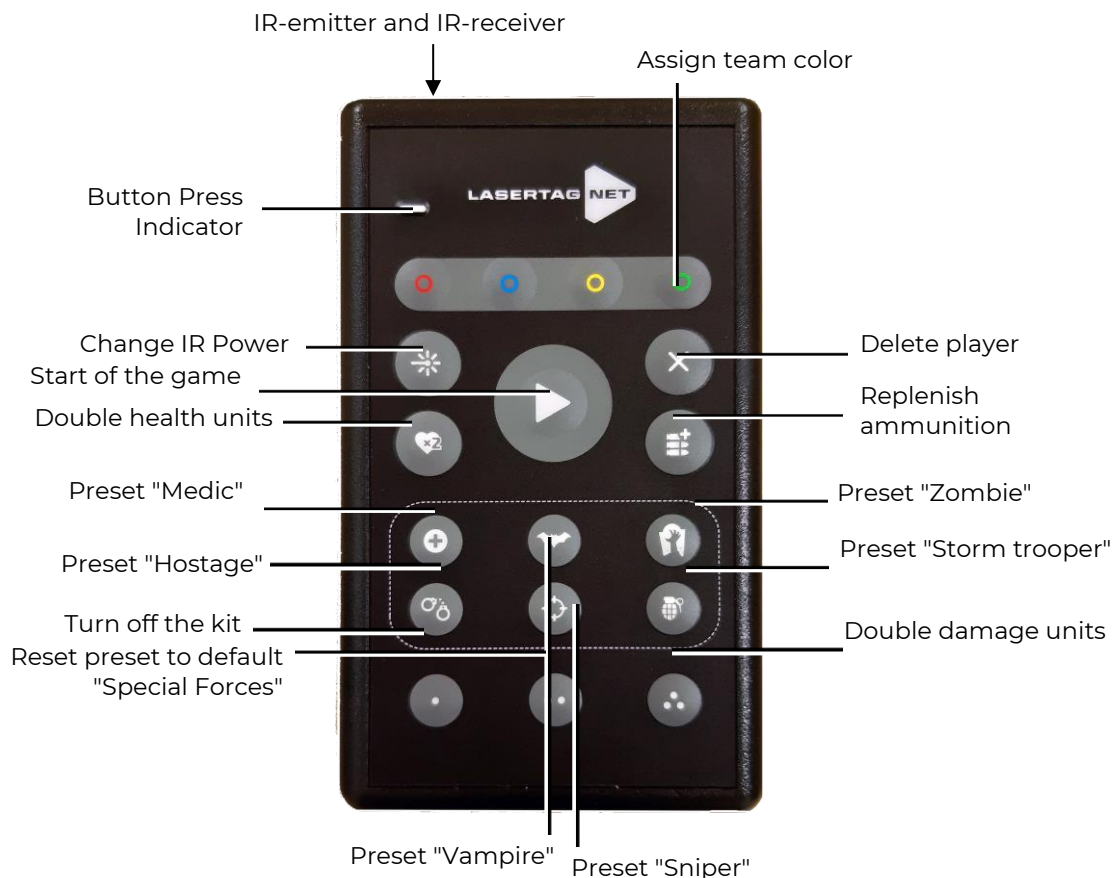
The headband has 4 hit sensors (3 along the perimeter of the headband and one in the control unit), and the vest has 9 sensors (6 on the front, 2 behind on the shoulders and another one is built into the control unit).

Inside the control unit, there is an electronic board on which one of the hit sensors is installed, a vibration device, as well as a battery that is charged by a charger through a special connector.

On the board, there are 4 LEDs (three green ones and one red), which show the dynamics of turning the device on and off. In addition, when the device is on, the LEDs will show the battery level if you shortly press on the power button: 100 % – all LEDs are lit, 75 % – two green and one red, 50 % – green and red, 25 % – only red, from 25 to 12 % – red LED blinks 2 times per second, less than 12 % – blinks 4 times per second.

1.2   Modes management

Since there is no Wi-Fi module in the control board, and there is no way to connect to the network, the adjustment and control is carried out only with the help of the Remote Control (RC).

IR-emitter and IR-receiver

Assign team color

Button Press Indicator

Change IR Power

Start of the game

Double health units

Preset "Medic"

Preset "Hostage"

Turn off the kit

Reset preset to default "Special Forces"

Delete player

Replenish ammunition

Preset "Zombie"

Preset "Storm trooper"

Double damage units

Preset "Vampire"   Preset "Sniper"

External elements of the remote control

Each hit sensor board and control board contain miniature IR emitters that allow you to issue protocol commands directly from the headband or vest.

There are 5 modes of autonomous operation of the headband/vest:

- «Activator»;
- «Medic»;
- «Zombie Walker»;
- «Frontier»;
- «Hostage».

To activate them, the buttons of the Remote Control are used:

«Medic»

«Zombie Walker»;»

«Hostage»

«Activator»

«Frontier»
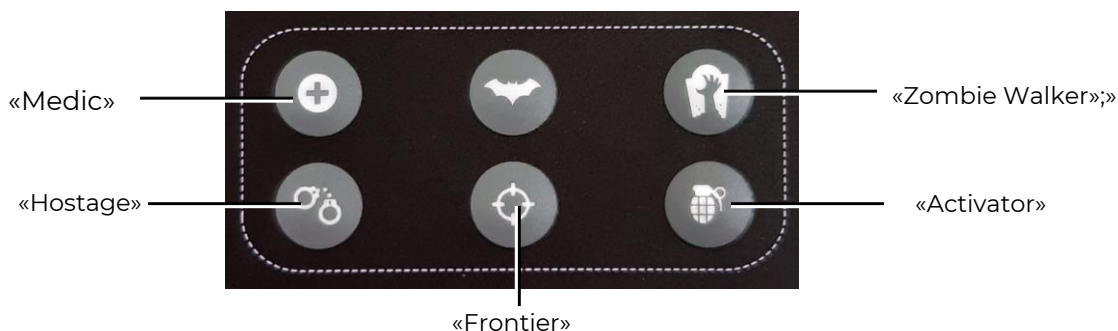
Players with headbands or vests which are activated offline can play as part of a team of players with full game kits (with tagers). Moreover, it is preferable to use them in the games controlled only with the remote control. Participation of such players in server games is also possible, but you need to take into account that such kits aren't managed from the application and don't participate in the general statistics.

According to the specifics of controlling devices for hits fixing and indicating (DFI) in offline mode, these devices do not respond to the commands of the remote control «Double health units», «Assign presets», «Replenish ammunition» та «Turn off the kit».

2   Autonomous headband or vest modes

2.1   Activator

The «Activator» mode allows a player equipped only with a headband or vest to respawn deactivated players of their team directly on the playground during the game.

The activator respawns once every 10 seconds players who are in the radius of effect of the IR rays of the device (about 3 meters of line of sight). In addition to the regular players, it also respawns the deactivated players of their team, who play only in headbands/vests included in the autonomous modes "Activator", "Zombie Walker" and "Medic".

Moreover, in this mode, the player is respawned, who plays only with the tager, which has built-in hit sensors, and with the same ID as the DFI. To prevent pairing of devices into one kit, make sure that the headband or vest is turned on autonomous mode first, and then the tager.

The Activator can be deactivated by the player of the opposing team. At the beginning of a round, it has 100 health units and damages weapons of opponents for 25 units. After 4 hits in it, it stops performing it function. You can restore the mode either with the help of a player of the same team with a similar role, or with an additional device (Multistation or Sirius) in the "Respawn" or "Base" mode, or by giving the "Start Game" command from the Remote Control.

To run «Activator» in autonomous mode on a headband or vest, do the following:

1. Choose a headband or vest in the game kit.
2. Turn on the device by long pressing the power button. The sensors glows with an overflow of all colors, and the buzzer reproduces short signals showing that the headband/vest is not connected to the tager with the same ID.
3. From a distance of not more than half a meter, direct the emitter of the Remote Control to any of the DFI sensors and press the "Stormtrooper Preset" button. The sound of high frequency is played and the headband sensors blink <u>red</u> with a frequency of 1 time per second.
4. Use the color assignment button to select the team that will be affected by the Activator. The beep sounds and the color of the glow of the sensors changes to the selected color.
5. Activation of the mode is carried out by pressing the "Start of the game" button on the Remote Control. The buzzer plays a long signal, the indicators flash for a second and go out. During the round, the activated headband briefly lights up with the team color about once every 20 seconds.
6. When hitting the device, the indicators respond with a flash of LEDs in white, and when deactivated (for example, after 4 hits), they first flash in white for a long time, and then flash with the color of the team once every 1 sec.
7. To reset mode, click on the "Delete player" button on the Remote Control.
8. To turn off the DFI, long press the power button on the control unit.

It is recommended to use a player with an activated headband or vest in the "Activator" mode as part of a group of players who storm, for example, the base of opponents or otherwise protect the platform for installing laser tag bombs. In this case, while the device of such a player is functioning, deactivated players do not need to return to the base to respawn.

The principle of operation of the headband/vest in the «Activator» mode

2.2   Medic

The player in the headband or vest in the autonomous mode "Medic", directly on the playground has the ability to restore the health units of the kits of participants of the round.

Taking into account the humanity of the role, the Medic within a radius of about 3 meters "treats" players regardless of their team – every 5 seconds replenishing their health level by 25 units (but not more than the starting value). The same effect is carried out on players with DFI in the autonomous mode "Medic" and "Activator". Players in the "Zombie Walker" presets have the opposite effect - their health level is reduced by the same 25 units. True, this only applies to players on your team, because the "Walkers" of the team of a different color manage to deactivate the "Medic" before its impact.

Also, a player with a headband or vest in this mode "treats" and a tager with the same ID that has hit sensors. It is only necessary to observe the condition that the turning on of the devices will be sequential: first the DFI is activated in the mode, and then the tager is turned on.

Medic at the start has 100 units of health and can be deactivated by shots from opponents' tagers (4 hits with damage of 25 units) or by an opponent's headband/vest in the autonomous mode of "Zombie Walker".

It can be restored either with the help of a player of the same team playing in the DFI with the "Activator" autonomous mode, or an additional device (Multistation or Sirius) in the

"Respawn" or "Base" mode, or by sending the "Start Game" command from the Remote Control.

To run «Medic» in autonomous mode on a headband or vest, do the following:

1. Choose a headband or vest in the game kit.
2. Turn on the device by long pressing the power button. The sensors glow with an overflow of all colors, and the buzzer reproduces short signals showing that the headband/vest is not connected to the tager with the same ID.
3. From a distance of not more than half a meter, direct the emitter of the Remote Control to any of the DFI sensors and press the "Medic Preset" button . The sound of high frequency is played and the headband sensors blink yellow with a frequency of 1 time per second.
4. Use the color assign button to select the team color. Although Medic affects all teams, the choice of color is necessary to neutralize the hit in the DFI by the players of their team. A sound signal is reproduced and the sensors light up once in the selected color, and then continue to flash in yellow.
5. Activation of the mode is carried out by pressing the "Start of the game" button on the Remote Control. The buzzer plays a long signal, the indicators flash for a second and go out
   During the round, every 5 seconds, in synchrony with the distribution of the protocol command, the yellow LEDs of the headband/vest flash and a short beep sounds.
6. When hitting the device itself, the indicators respond with a flash of LEDs in white, and when deactivated, they first flash in white for a long time, and then flash with the same color once every 1 sec.
7. To reset mode, click on the "Delete player" button on the Remote Control.
8. To turn off the DFI, long press the power button on the control unit.

Players in headbands or vests with the function of autonomous mode "Medic" are recommended to be included in the group that performs a certain tactical task. They will, without waiting for the deactivation of players' kits, "feed" their health units. In addition, such players will defend their group from opponents in the roles of "Vampire" and "Zombie". But make sure that the Medic does not accidentally heal other players.
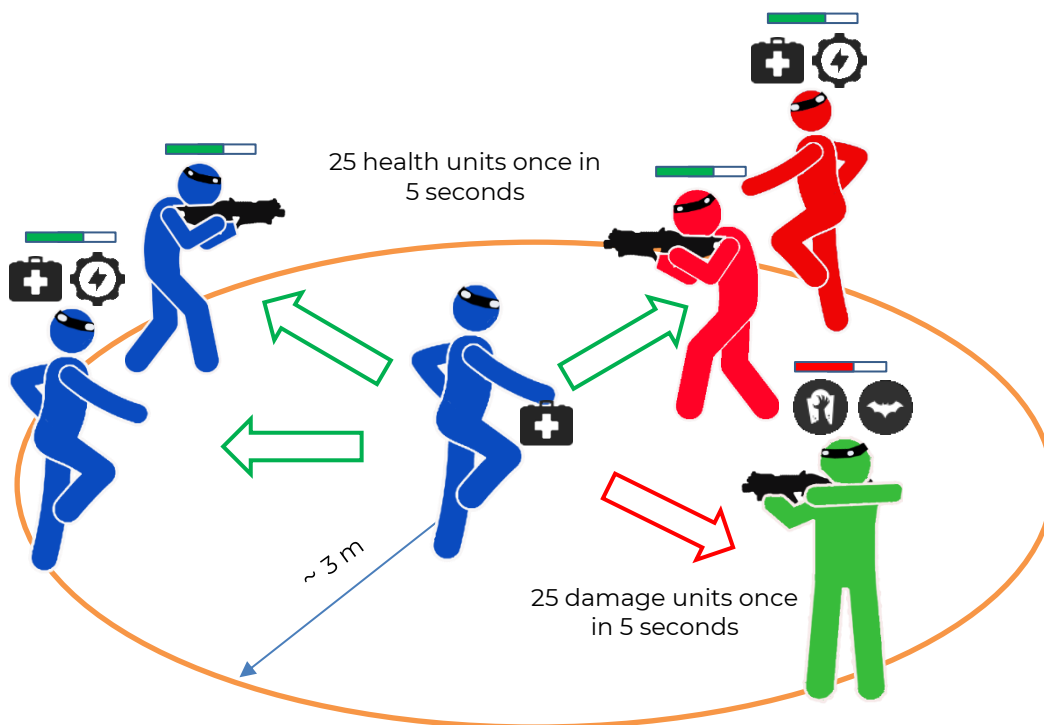
The principle of operation of the headband/vest in the «Medic» mode

2.3   Zombie Walker

The autonomous mode of "Zombie Walker" is the complete opposite of the "Activator" mode – if an opponent approaches a player with such a role, the Walker strikes their kit, 2-3 times per second distributing a protocol command with damage of 100 health units.

Similarly, the device affects players with headbands or vests in the autonomous modes "Medic", "Zombie Walker" and "Activator". When meeting with a player from another team, also wearing a headband with the "Zombie Walker" mode, the player whose activity pause ends later is affected, i.e. almost by accident.

The DFI in the " Frontier " mode is affected only if the Walker is not in the red team. Autonomous headband or vest in the "Hostage" mode is not affected.

A tager with an identical ID, which has hit sensors and participates in the round, is not affected by the Walker, regardless of which team it is in. You only need to first turn on and activate the headband or vest in autonomous mode, and only then turn on the tager. Moreover, the effective actions of the DFI are credited to the player with this tager.

Zombie-Walker at the start has 100 units of health and can be deactivated by shots from opponents' tagers (4 hits with damage of 25 units) or by an opponent's headband/vest in the autonomous mode of "Zombie Walker". The device in the "Frontier" mode affects the Walker in any color except red, but, as a rule, does not have time to hit it due to the difference in the magnitude of the damage and the frequency of activity.

It can be restored either with the help of a player of the same team playing in the DFI with the "Activator" autonomous mode, or an additional device (Multistation or Sirius) in the "Respawn" or "Base" mode, or by sending the "Start Game" command from the Remote Control.

To run "Zombie Walker" in autonomous mode on a headband or vest, do the following:

1. Choose a headband or vest in the game kit.
2. Turn on the device by long pressing the power button. The sensors glows with an overflow of all colors, and the buzzer reproduces short signals showing that the headband/vest is not connected to the tager with the same ID.
3. From a distance of not more than half a meter, direct the emitter of the Remote Control to any of the DFI sensors and press the "Zombie-Walker Preset" button

   . The sound of high frequency is played and the headband sensors first flash when turned on – red (when reactivated – the color of the team set before), and then begin to blink in blue with a frequency of 1 time per second.
4. Use the color assignment button to select the team color that the Walker will not affect. A sound signal is reproduced and the sensors flash once in the selected color, and then continue to flash in blue.

5. Activation of the mode is carried out by pressing the "Start of the game" button on the Remote Control. The buzzer plays a long signal, the indicators flash for a second and go out.
6. Next, you can adjust the radius of influence of the device. To do this, direct the Remote Control to the sensors and press the "Change the power of the IR beam" button.

   You can select 4 values: approximately 1, 2, 5 and 10 m – each press of the button changes the range in a circle. When you first turn on the DFI, it has a range of 1 m. To determine the value, you need to press the button until a low sound of the headband buzzer appears. This corresponds to 1 m. The next click assigns a range of 2 m, etc. The distance does not affect the number of health units deducted.
7. During the round, every 10 seconds, the headband/vest LEDs briefly light up in blue. When influenced by the Walker on the kit of their team, the player's tager speaker reproduces a clicking sound, but the player does not receive damage.
8. When hitting the device, the indicators respond with a flash of LEDs in white, and when deactivated, they first flash in white for a long time, and then flash with the color of the team once every 1 sec.

9. To reset mode, click on the "Delete player" button on the Remote Control.
10. To turn off the DFI, long press the power button on the control unit.

100 damage units once in 0,5 seconds

Up to 10 m
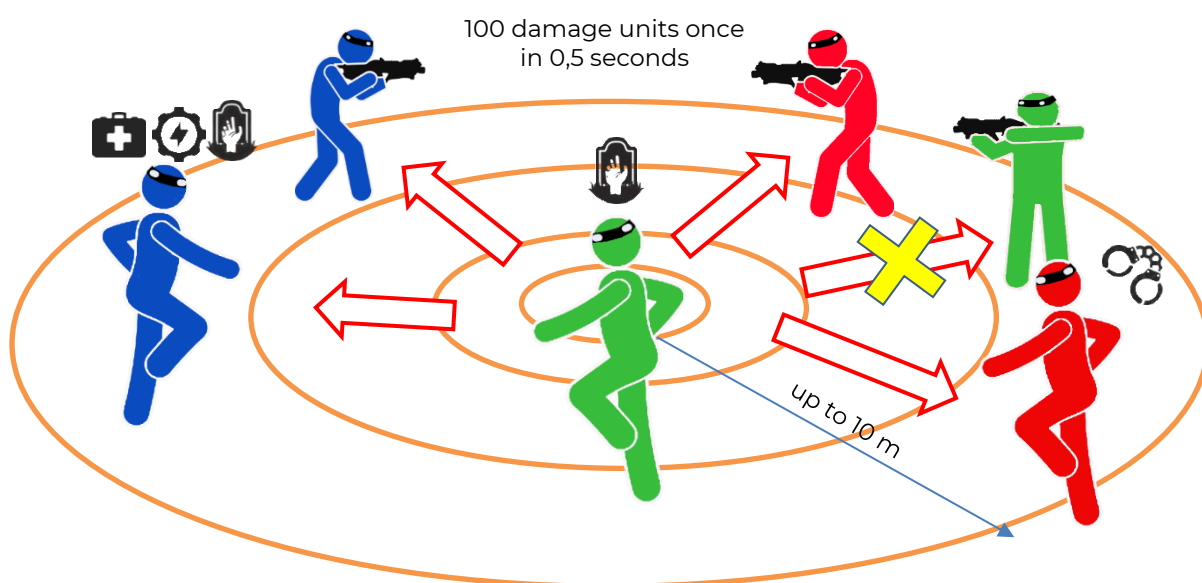
The principle of operation of the headband/ vest in the «Zombie Walker» mode

Autonomous mode of headband or vest "Zombie walkers" due to the almost circular impact is convenient to protect your own base from opposing players. Also, such a player can be included in the breakthrough group, which will clear the defense of a team of a different color.

2.4 Frontier

Autonomous mode "Frontier" allows you to conduct a game scenario in which players in one or in small groups must go a certain route for some time. As obstacles, headbands or vests are consistently placed on it at a certain distance.

In order to make it impossible to get close to them or pass by, devices with their IR emitters within a radius of approximately 3-4 meters every 2 seconds hit kits of players with a protocol command, which reduces the level of health by 50 units. Influence occurs on players of teams of all colors, except <u>red</u>. A set with the "Hostage" preset is affected by a team of any color.

In addition, the DFI in this mode affects headbands or vests that participate in the game in other autonomous modes, including the "Frontier" mode. Therefore, the lines must be located at a distance of at least 3 meters, so that there is no mutual deactivation. Headbands in Zombie Walker mode of any color except red will hit Frontier before it is affected.

In order to pass the border and move further, it is necessary to deactivate the obstacle by hitting from the tager.

The route must be built in such a way that players do not have the opportunity to avoid the lines of the side. For example, you can enclose the space with signal tapes or organize competitions in the long corridor of the room.

At the start of the game, headbands/ vests – the lines have 100 units of health. The number of hits for their deactivation depends on the degree of the damage set in the weapon settings.

So, if the loss of the tager with the default preset is 25 units, then it is enough to hit the DFI 4 times to pass the line. The kit launched into the game with the help of the remote control with the preset "Sniper", for each hit causes damage to 50 units - therefore, it is enough for it to hit the target 2 times. For a more correct game, it is recommended to set the weapon to single shots mode (double short press the reload button until the symbol appears on the display).

The winner is determined by the shortest time spent on the route. And here, not only the accuracy of shooters is important, but also the speed of their movement.

To carry out such a scenario, it is necessary:

1. Choose from a set of game kits the desired number of headbands or vests.
   It is recommended to use from 3 to 5 pieces. Packaged tagers do not participate in this scenario, because they cannot deactivate the headband/vest with an identical ID, as, however, the DFI does not hit its "own" tager.
2. Go to the first line.
3. Turn on the device by long pressing the power button. The sensors glows with an overflow of all colors, and the buzzer reproduces short signals showing that the headband/vest is not connected to the tager with the same ID.
4. From a distance of not more than half a meter, direct the emitter of the Remote Control to any of the DFI sensors and press the "Sniper Preset" button. The sound of low frequency is played and the headband sensors blink red with a frequency of 1 time per second.
5. In this mode, the <u>color of the team</u> is not selected, so to activate the headband, immediately press the "Start Game" button . There is a high sound of the

signal, and the nature of the flashing of the sensors changes a little. DFI is activated in the "Frontier" mode.

6. Next, you need to activate the following headbands/vests, placing them on the lines. Alternatively, you can immediately activate all DFIs, and then place them along the route.
7. Turn on all kits that participate in the game.
8. Check that the color of the kit team is not red.
9. Direct the emitter of the remote control to any of the sensors of the kit (on the headband, vest or tager) and press the "Start Game" button.
10. The first player or group of players advances to the first line and should deactivate the first obstacle aiming their shots from the tager.
11. For each hit, the Frontier reacts with a blink of white. When deactivated, the sensors first pulsate in white for a few seconds, and then light up with a green pulsing color, indicating that the way is clear.
12. On passing the line, the player is given almost 30 seconds, of which about 8 seconds the headband glows green, and then 20 seconds the sensors do not glow.
13. A player or a group of players move further along the lines, consistently "clearing" their way. At the finish, you can put a Domination Box, so that the players capture it and fix their moves.
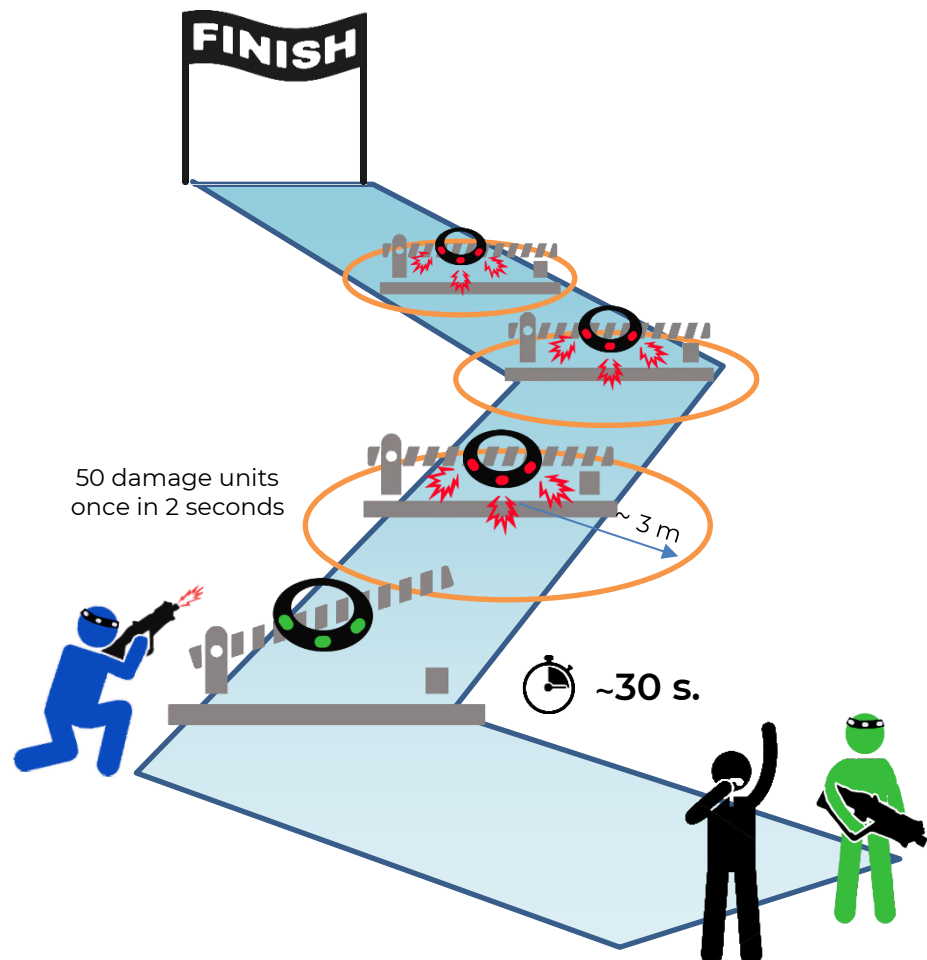
The principle of operation of the headband/vest in the «Frontier» mode

14. Next, the headband self-heals and again begins to hit the player kits with the same indication - flashes red once per second. Therefore, you can immediately let the next player or group in, noting the time for them.

15. To reset mode, click on the "Delete player" button on the Remote Control.
16. To turn off the DFI, long press the power button on the control unit.

In the "Activator" mode, the headband/ vest can also be used as a "guard" of some artifact or the same Domination Box – players will first need to neutralize the headband, and then they have the time of 30 seconds to capture the DB.

2.5 Hostage

«Hostage» mode is the simplest autonomous mode that is used in a scenario where the player needs to be held on a certain route, not allowing the opponent to hit him.

The headband or vest in this mode does not affect the kits of players.

At the start of the game, the Hostage has 100 health units. The number of hits to deactivate it depends on the degree of damage set in the weapon settings. So, the default preset "Special Forces" damage of the tager is 25 units, so to deactivate the Hostage it is enough to get into their DFI 4 times.

The headband or vest in this mode can be hit by the DFI in the autonomous mode "Medic" (adds health units) and "Frontier" (causes harm).

It can be restored either with the help of a player of the same team playing in the DFI with the "Activator" autonomous mode, or an additional device (Multistation, Sirius) in the "Respawn" or "Base" mode, or by sending the "Start Game" command from the Remote Control.

To run "Hostage" in autonomous mode on a headband or vest, do the following:

1. Choose a headband or vest in the game kit.
2. Turn on the device by long pressing the power button. The sensors glows with an overflow of all colors, and the buzzer reproduces short signals showing that the headband/vest is not connected to the tager with the same ID.
3. From a distance of not more than half a meter, direct the emitter of the Remote Control to any of the DFI sensors and press the "Hostage Preset" button. The sound of high frequency is played and the headband sensors initially flash in purple at a frequency of 1 time per second.
4. Use the color assignment button to select the team color that will perform the mission and will not affect the Hostage. A sound signal is reproduced and the sensors flash once in the selected color, and then continue to flash in purple.
5. Activation of the mode is performed by pressing the button of the remote control "Start of the game" . The buzzer plays a long signal, the indicators flash for a second and go out.
6. During the round, the headband/vest LEDs light up briefly in purple every 5 seconds.
7. When hitting the device itself, the indicators respond with a flash of LEDs in white, and when deactivated, they first flash in white for a long time, and then flash with the same color once every 1 sec.
8. To reset mode, click on the "Delete player" button on the Remote Control.
9. To turn off the DFI, long press the power button on the control unit.

During the execution of the scenario, players of the team need to clear the way for the Hostage by deactivating the opponent's players. At the same time, try to avoid hitting the DFI of the protected player. Since the Hostage can be respawn at the Base, the scenario can include several attempts to guide them along the route.

The principle of operation of the headband/vest in the «Hostage» mode

3　Comparative table of indications and functions of autonomous modes of headband or vest

Parameter / Mode	Activator	Medic	Zombie Walker	Frontier	Hostage
Turning on with the Remote Control Button					
Turn-on indication	Red	Yellow	Blue	Red	Violet
Team color selection	✓	✓	✓	-	✓
Glow during the round	Team color	Yellow	Blue	Red / green	Violet
Frequency of activities, s	10	5	0,5	2	-
Amount of affection, units of health	Respawn	+50	-100	-50 except red	-
Radius of influence, m	up to 3	up to 3	from 1 to10	up to 3	up to 3
Starting value of health units	100	100	100	100	100
Autorespawn	-	-	-	✓	-
Impact on players with a tag gun and the "Special Forces" (default), "Medic", "Hostage", "Sniper" and "Stormtrooper" presets	✓ own team	✓ all	✓ opponents *	✓ except red	-
Impact on players with a tag gun and the "Vampire" and "Zombie" presets	✓ own team	✓ all	✓ opponents	✓ except red	-
Impact on players only wearing the "Activator" headband	✓ own team	✓ all	✓ opponents	✓ except red	-
Impact on players only wearing the "Medic" bandage	✓ own team	✓ all	✓ opponents	✓ except red	-
Impact on players only wearing the Zombie Walker headband	✓ own team	✓ all	✓ opponents	-	-
Influence on the "Frontier"	-	-	✓ except red	✓	-
Impact on players only wearing the "Hostage" headband	-	✓ all	-	✓	-

　　* DFI in the "Zombie Walker" mode strikes a kit with a tager that plays with the "Hostage" preset, regardless of the color of the team.