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PULSAR

FORWARD DFA75

DIGITAL NV ATTACHMENT

I N S T R U C T I O N S

ENGLISH / FRANÇAIS / ESPAÑOL / РУССКИЙ

Class 1 Laser Product

Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Attention - l'emploi de commandes, réglages ou performances de procédure autres que ceux spécifiés dans ce manuel peut entraîner une exposition à des rayonnements dangereux.

Atención! La utilización de controles, ajustes o parámetros de procedimiento distintos de los aquí indicados puede provocar una exposición a radiaciones peligrosas.

Внимание – использование других не упомянутых здесь элементов управления и настройки или других методов эксплуатации может подвергнуть Вас опасному для здоровья излучению.

Laser aperture

DIGITAL NIGHT VISION ATTACHMENT Forward DFA75	2-17	ENGLISH
L'ATTACHEMENT DE VISION NOCTURNE DIGITAL Forward DFA75	18-35	FRANÇAIS
VISOR NOCTURNO ACOPLABLE DIGITAL Forward DFA75	36-51	ESPAÑOL
ЦИФРОВАЯ НОЧНАЯ НАСАДКА Forward DFA75	52-67	РУССКИЙ

ENGLISH

SPECIFICATIONS

SKU MODEL	78114 DFA75
Optical characteristics	
Generation	Digital
Optical magnification, x	1
Lens	50 mm ƒ1.0
Field of view, degree / m (at 100m distance)	5 / 8.7
Exit pupil, mm	30
Resolution, lines/mm, at least	50
Max. detection range with attachable laser illuminator, m / yds*	400 / 473
Close-up distance, m	5
Array characteristics	
Type of array	CCD
Resolution, pixel	500 (H) x 582(V)
Format (physical dimensions)	1/3" (4.8x3.6mm)
Display characteristics	
Type	OLED
Resolution, pixel	640x480
Diagonal, mm	8
Attachable laser illuminator	
Wavelength, nm	915
Equivalent power (variation range), mW	150 (90-110-150)
Safety class for laser equipment according to IEC 60825-1:2007	1
Output power for laser radiation, not more than	20 mW
Operational characteristics	
Operating voltage, V / Battery	3.7 - 6 V / 4xAA
External power supply	DC 8.4-15V
Operating temperature	-25 °C... +50 °C / -13 °C... +122 °C
Operation time with one set of rechargeable batteries	
(built-in IR off/on), hour	2 / 1.5
Operation time with external power supply EPS3/EPS5, hour	7 / 18
Operating frequency of wireless remote control	2.4 GHz
Operating voltage, V / Battery of RC	3 / CR2032
Max. shock resistance	6000 Joules
Dimensions of the attachment (w/out monocular), mm / inch	155x82x117 / 6.1x3.2x4.6
Dimensions of the attachment with monocular, mm / inch	246x82x117 / 9.7x3.2x4.6
Weight (without / with batteries), kg // oz	0.56 / 0.65 // 19.7 / 22.9

** Max. detection range of an object measuring 1.7x0.5 m in natural night conditions (0.05 lux, quarter moon).*

1 PACKAGE CONTENTS

- Digital attachment DFA75
- Protective covers
- Cover ring adapter**
- 915 nm attachable laser IR Illuminator
- Spare battery container
- Wireless remote control
- Plastic case / Carrying case***
- Video cable
- User manual
- Lens cloth
- Warranty card

*** Supplied with models 78116, 78117, 78118*
****Varies by shipment.*
For improvement purposes, design of this product is subject to change.

Digital Night Vision Attachment Forward DFA75 is a universal device able to convert your daylight optical sight into a night vision device. The attachment is mounted on a bell of a day sight with the help of the adapters suited for various lens diameters.
The attachment is designed for professional and amateur use, such as hunting, security, sports shooting, night and day video recording, general observation.

2 FEATURES

Optics
- Fast aperture lens 50 mm ƒ1.0
- Accurate internal focus adjustment
- 1x optical magnification

Electronics
- Quality OLED display (640x480 Pixel)
- Highly sensitive CCD Array
- Signal processing program Sum Light™
- Adjustment of the aiming point
- Resistant to bright light exposure

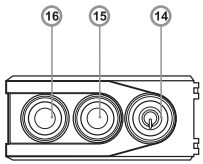
Extra features
- 915 nm Laser IR Illuminator (invisible range)
- Wireless remote control
- Wide range of brightness and contrast settings
- Low battery indicator
- External power supply
- Video output for video recording
- Built-in clock
- Selectable output video signal
- Horizon adjustment function

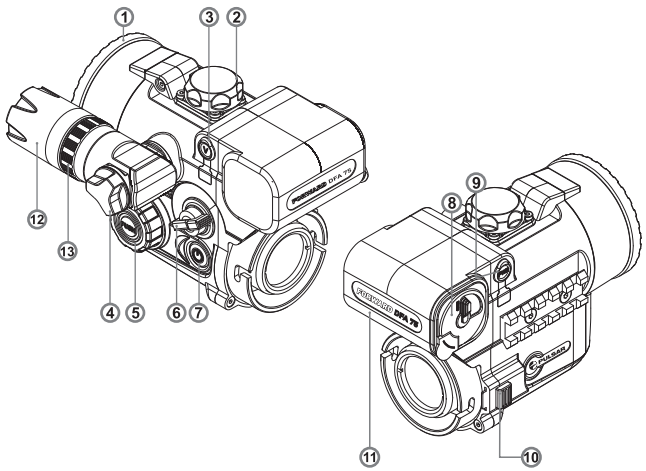
3 COMPONENTS AND CONTROL ELEMENTS

1. Lens cap
2. Lens focus knob.
3. Video output
4. Screw to mount the attachable laser IR Illuminator.
5. Controller
6. Knob for power control of the laser Illuminator
7. On/Off button
8. Battery compartment
9. “Power” jack connection to external power supply (bought separately).
10. Clamp
11. Battery container
12. Laser IR Illuminator lens holder
13. Laser IR Illuminator locking ring

Wireless remote control:

14. “**ON**” button
15. “**IR**” button
16. “**SumLight™**” button





4 DATA PANEL ICONS

▲▼ ◀▶	Reticle movement directions
X=00 Y=00	Reticle's X and Y coordinates
◑	Contrast mode
S	“Sum Light™” mode
☼ ◑	Adjustment of display brightness and contrast
00:00 AM	Clock
▭	Low battery indicator
◷	Clock setup mode
↻	Default settings
IR▪ IR▪▪ IR▪▪▪	Indication for IR Illuminator power level
—✕—	Horizon adjustment function
▭▸	Indication for external power supply
⌖	Aiming point adjustment mode
ᯤ	Indication of activation of wireless remote control
▭	Limiting frame
✕	Auxiliary cross
▭→	PAL/NTSC video output signal selection
M_1	Submenu M1
M_2	Submenu M2
D	Function “Distance”
M/Y	Selection of distance measurement unit

5 GUIDELINES FOR OPERATION

The attachment was designed for extensive usage. To ensure longevity and performance, please adhere to the following:

- Before use make sure that you have installed the attachment according to the instructions of the section 8 **"Operation"**.
- Store with the lens cap on in the carrying case.
- Switch off the unit after use.
- The unit cannot be submerged in water.
- **Attempts to disassemble or repair the scope will void the warranty!**
- Clean the scope's optical surfaces only if necessary, and use caution. First, remove (by blowing with a blower brush or canned air) any dust or sand particles. Then proceed to clean by using camera/lens cleaning equipment approved for use with multicoated lenses. Do not pour the solution directly onto the lens!
- The riflescope can be used in operating temperatures ranging from -25 °C... +50 °C. However, if it has been brought indoors from cold temperatures, do not turn it on for 3 to 4 hours. This will prevent external optical surfaces from fogging.
- To ensure reliable performance, it is recommended to carry out regular technical inspections of the unit.
- Batteries shall not be exposed to excessive heat such as sunshine, fire or the like.

6 INSTALLATION OF BATTERIES

- Turn the lever of the battery compartment **(8)** 90 degrees in "Open" position and, pulling by the lug of the cover, remove the battery container.
- Install four AA batteries (or rechargeable batteries) observing marking shown on the battery container.
- Insert the battery container into the battery compartment observing polarity and turn the lever 90 degrees clockwise.

Note: to ensure long and reliable operation it is recommended that you use quality rechargeable batteries with a capacity of at least 2500 mAh. Please do not use batteries of different types or batteries with various charge levels.

7 EXTERNAL POWER SUPPLY

- The unit can be powered with an external DC power supply (2.1mm pin) with stabilised voltage ranging from 8.4V to 15V or a 12V vehicle socket.
- External power supply (AC/DC) is to be connected to "Power" **(9)** jack located on right side of the device.
- **Please note that the central pin of the power supply that you connect to the "power" jack of the riflescope, must have marking "+". The power supply may have marking - -⊙-+ .**
- Connection of an external power supply (icon –■– shows up on the data panel) automatically cuts off power supply from batteries.

External power supply DOES NOT charge the rechargeable batteries in the unit.
Attention! We suggest that you use battery packs EPS3 or EPS5 ensuring from 7 to 18 hours of operation.

8 OPERATION

Mounting the attachment on daylight sight

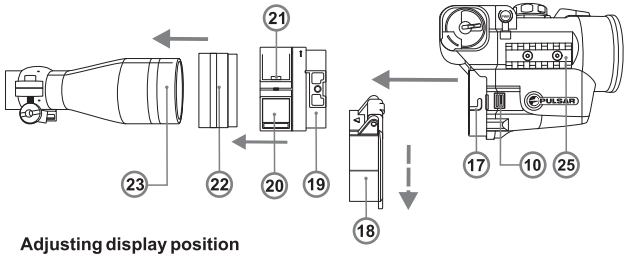
- Choose an adapter with an insert of the required diameter depending on the outer diameter of the bell of the daylight sight.
  The figures 42 mm, 50 mm, 56 mm in adapter's model name correspond to the optical diameter of the sight's bell.
  Measure the outer diameter of the housing of your sight's bell and select an insert in accordance with reference data in the tables below.
  Example. If the lens diameter of your day sight is 42 mm, and the measured outer diameter of the housing of the sight's bell is 47.2 mm, you need to use an insert with marking "Ø 47".

Compatibility chart of inserts for the day sights

Lens diameter of day sight, mm	Outer diameter of the housing of sight's objective lens, mm	Inner diameter of the insert, mm
42	46.7-47.6	47
	47.7-48.6	48
	48.7-49.6	49
	49.7-50.6	50
50	54.7-55.6	55
	55.7-56.6	56
	56.7-57.6	57
	57.7-58.6	58
	58.7-59.6	59
56	59.7-60.6	60
	60.7-61.6	61
	61.7-62.6	62
	62.7-63.6	63
	63.7-64.6	64
	64.7-65.6	65

- Remove the cover **(18)** from the Cover Ring Adapter 42mm **(#79121)** by turning it clockwise. To remove the cover from the Cover Ring Adapter 50 mm **(#79122)** or 56 mm **(#79123)**, turn the cover counterclockwise.
- Put the insert **(22)** into the adapter, unsnap the clamp **(20)** of the adapter **(19)** and firmly mount the adapter on the sight's bell **(23)** to ensure that the surface in the bottom part of the adapter is located above the barrel.
  Important! The insert must be installed with the narrowed part facing downward (see the scheme).
- Snap the clamp.
  Attention! Before installation it is advised to degrease the sight's bell.
- Use a hex-nut wrench to tighten the screw **(21)** to ensure that the adapter with the insert fit closely to the sight's bell when the clamp rotates. When tightening the screw, the holding power must be 0.7-0.9 N·m. Holding power can be checked with a torque screwdriver.
- Insert the optical device into the adapter so that the teeth in the adapter's body enter the notches **(17)**. Turn the digital module counterclockwise until it clicks to ensure that the clamp **(10)** enters the groove in the adapter.

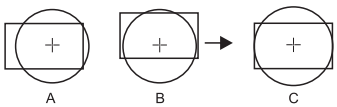
- If necessary, do the horizon adjustment according to the instructions in section 10.
- In order to remove the attachment, move the lock **(10)** to the right and turn the attachment clockwise until it clicks. Pull the attachment and remove it carefully.



Adjusting display position

If you noticed that after mounting the attachment on your rifle, the image on the display is off the centre of the field of view (pic. A, B), you can centre the image:
- unsnap the clamp **(20)**,
- incline and move the attachment together with the adapter to achieve image position as shown in image C.
- then re-lock the clamp in place.

Important! Image position does not affect the point of impact.



Recommended day sights.

Day sights with a magification set to 3-7x are optimal for the use with the Forward DFA75 digital attachment. At higher magnifications (more than 8x) the attachment may show pixilated image and lower resolution. To be able to see the complete lower data panel with the menu icons, please use a day sight with a field of view exceeding 4.5 degrees.

Starting the unit and image setup

- Install the batteries in accordance with the **"Installation of batteries"** section or connect an external power supply.
- Rotate the lens cap **(1)** 45 degrees counterclockwise to open and remove it.
- Turn on the "ON" button **(7)** - the display will light up in a couple of seconds.
- If your sight has parallax adjustment option, set a distance corresponding to 100 metres.
- To adjust display brightness, rotate the encoder **(5)**. Brightness level from 0 to 20 is shown next to the icon ☼ in the middle of display.
- Press the encoder **(5)** to switch to display contrast setup mode **(16)**.
- The display shows icon ◐ and contrast level from 0 to 20 next to it.
- Choose a still object that is, for instance, 100 metres away.

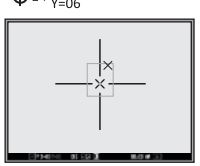
- Rotate the lens focus knob **(2)** to acquire best possible image sharpness.
- In low light conditions or in complete darkness attach and turn on the built-in laser IR Illuminator by rotating the knob **(6)** clockwise (make sure the IR is mounted).
- Rotate the knob **(6)** to adjust IR power (icons IR· IR: IR⁝ on the data panel): clockwise – to increase power; counterclockwise – to decrease power. Icon ⅄R means that the IR Illuminator was not installed.
- When finished, turn off the attachment by pushing the "ON" button **(7)**.
- Close the lens cap **(1)**.

9 CHECK AND ADJUSTMENT OF THE AIMING POINT

- The attachment is adjusted at the factory so that after mounting it on a duly zeroed daylight sight you will not need to adjust the aiming point. However, if your attachment was hit or dropped, you can check the aiming point and adjust it, if necessary, without going to the service center.

How to adjust the aiming point:

- Place a target at a distance of 100m (or another distance if you wish to changer basic settings).
- Take a couple of shots and make sure that you day sight is properly zeroed.
- Mount the attachment on your day sight according to section 8, select "D100" in "Distance" item in the menu (see section 11) and take a few shots. If the point of impact did not change, you do not need to adjust the aiming point. If the point of impact did change, adjust the aiming point.
- Enter the menu by keeping the controller **(5)** pressed for two seconds. Choose submenu M2 and rotate the controller to choose the icon ⌖ then push the controller. Figure "1" with horizontal arrows ⌖1↔ will appear next to this icon and a limiting frame with an auxiliary cross will appear in the centre of the screen.
- Match the auxiliary cross with the centre of the daylight sight's reticle (the limiting frame moves along with the cross). To do this, rotate the controller to move the cross and limiting frame along the X coordinate. To switch from the X to the Y coordinate, push the controller - Figure "1" and vertical arrows will appear next to the icon ⌖1↕.
- Keep the controller pressed for two seconds. Figure "2" and horizontal arrows with X and Y coordinates will show up next to the icon (current coordinate values correspond to factory settings). ⌖2↕ X=-02 Y=06
- Keep the sight's reticle in the aiming point and move the auxiliary cross to the point of impact by rotating the controller in X and Y directions.



- Rotate the controller to move the auxiliary cross within the limiting frame along the X coordinate.
- Press the controller to switch to the Y coordinate. The auxiliary cross should eventually match the point of impact, with the sight's reticle being held in the aiming point.
- To save zeroing reticles, keep the controller pressed for two seconds - you will exit the menu and the image of the target centre should now coincide with the centre of the of sight's reticle.

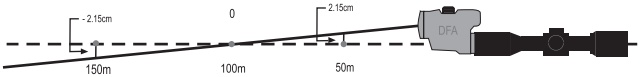
Attention! Do not turn off the attachment before zeroing settings are saved, otherwise your settings will be lost.

- Take a few shots with the attachment on and make sure that the point of impact matches the aiming point.
- If the point of impact has considerably deviated while adjusting it, we suggest that you set the coordinates to X=0; Y=0 (or return to the default settings) and repeat the procedure.
  Note: the auxiliary cross can only move within the red limiting frame (see pic.). Click value is 14.5 mm at 100m.

The point of impact in the attachment does not change because the attachment has a calibrated magnification of 1x, achieved due to the use of precise digital zoom which prevents the shift of the target (object) image relative to the centre of the aiming reticle of a day sight.

10 PECULIARITIES OF PRECISE SHOOTING AT SHORT AND LONG DISTANCE

- A peculiarity of the DFA75 design is the location of its objective lens axis above the day sight's optical axis. This design allows the attachment to have shorter length and to allocate attachment's controls as close as possible to a shooter which ensures better usability. Also, this design significantly relieves day sight load when recoiling.
- At the same time, certain adjustments of the aiming reticle for shorter distances are required to be made when shooting with the attachment.
  The image below explains the reasons.



- As the attachment is used with day sights that are normally adjusted for a distance of 100m, the attachment is set up to operate with such sights. When shooting at a distance of 100m or similar the aiming point of a day sight remains unchanged, no matter with or without the attachment.
- When shooting at distances significantly different from 100m, and especially for high precision shooting at close distances.

To adjust the aiming point, please use the function “Distance”, available in the menu of the attachment (section 11 “MENU”).

- Choose item D in the submenu M1 and press the controller.
- Rotate the controller to choose approximate shooting distance - 15/20/30/50/75/100/150/300 meters. To switch from meters to yards, choose item “M/Y” in the menu.
- Push the controller to confirm your choice. The selected distance wil be shown on the lower data panel - for example, D150.

When shooting, you can also make adjustments manually, without changing settings of the attachment according to the data in the table below:

Distance to the target	Required adjustment of aiming point			Direction of aiming point movement
	cm	Mil	MOA	
300m	8.72	0.3	1	⇩
200m	4.3	0.2	0.75	⇩
150m	2.15	0.15	0.5	⇩
100m	**0**	**0**	**0**	
75m	1.09	0.15	0.5	⇧
50m	2.15	0.4	1.5	⇧
30m	3.05	1	3.5	⇧
20m	3.5	1.75	6	⇧
15m	3.7	2.5	8.5	⇧
10m	3.92	4	13.5	⇧

⇩ drop the aiming point ⇧ raise the aiming point

Example. If the target is 50 m away, the aiming point of the day sight should be moved upwards by 2.15 cm (equals to 0.4 Mil or 1.5 MOA).

Attention! If you have changed the aiming point for another distance during the aiming point adjustment, to use the table above, you will need to recalculate the distances according to the formula L = L table/(100/L zeroing).
Example. If you have changed the basic zeroing distance to 50m, the values for 50 m in the table will correspond to 25 m (L=50/(100/50).

11 MAIN MENU

The menu includes two submenus [M1] and [M2] which include items as follows:

[M1]
- D - function “Distance”
- S - function “Sum Light™”
- ◑ - function “Contrast”
- ↻ - return to default settings

[M2]
- 🕒 - function “Clock”
- ⇨ - video output selection
- —⨯— - function “Horizon adjustment”
- M/Y - selection of distance measurement unit
- 📶 - wireless remote control
- ⌖ - adjustment of the aiming point

The active submenu is highlighted with a frame [M1]
To switch to the other submenu, rotate the controller and move the cursor to [M1] or [M2] (the frame will be flashing) and push the controller.

Function “Distance”
This function allows automatic adjustment of the aiming point depending on the distance you shoot with you day sight.

- Choose item D in the submenu M1 and press the controller.
- Rotate the controller to choose approximate shooting distance - 15/20/30/50/75/100/150/300 meters. To switch from meters to yards, choose item “M/Y” in the menu.
- Push the controller to confirm your choice. The selected distance wil be shown on the lower data panel - for example, D150.

Function SumLight™
After the Forward DFA75 is switched on, the Sum Light™ activates automatically. The use of Sum Light™ substantially increases sensitivity of the CCD array thus enabling observation in low light without using the IR Illuminator.
When using the attachment at a sufficient level of night illumination, the Sum Light™ function can be deactivated manually (using the wireless RC or the menu).

NOTE: higher sensitivity causes an increased noise level in the picture, lower frame rate; image slows down, if the unit is rapidly moved from one side to the other, the picture may be blurred for a moment. Neither of these effects is a flaw of the unit. After the SumLight™ Signal Processing Program is activated, light dots (pixels) may appear in the field of view which is explained by operation peculiarities of this function. This is not a defect either.

- Keep the controller **(5)** pressed for two seconds to enter the menu.
- Rotate the controller to choose the icon S and it will show up on the data panel.
- Push the controller to activate the mode. “On” sign will show up next to the icon S.
- To deactivate the mode, re-enter the Sum Light™ mode item. “Off” sign will show up next to the icon S.
- To exit main menu, hold the controller **(5)** pressed for two seconds. Or wait ten seconds to exit automatically.

Contrast mode
- Keep the controller **(5)** pressed for two seconds to enter the menu. Rotate the controller to choose icon ◐.
- Push the controller, “On” sign will show up next to the icon ◐.
- To deactivate the mode, push the controller again - “Off” sign will show up and icon will disappear.
- To exit main menu, keep the controller **(5)** pressed for two seconds. Or wait ten seconds to exit automatically.

Restore default settings
- Enter the menu by keeping the controller **(5)** pressed for two seconds.
- Rotate the controller **(5)** to choose the icon ⟳ in submenu M1 and push the controller – the following settings will be restored to default values:
  - Coordinates of the auxiliary cross: X=0; Y=0;
  - **SumLight** - On; **Auto Contrast** - Off; **Brightness** - 10; **Contrast** - 10;
  The liming frame with the auxiliary cross move to the display centre.
  The horizontal red line moves to the display centre.

Clock
Please do the steps as follow to setup the clock:
- Keep the controller pressed for two seconds and rotate to choose icon 🕒 in submenu M2.
- Push the controller and rotate it to select time format 24/PM/AM. Parameter being changed blinks.
- Push the controller to pass to the hour setup. Rotate the controller to setup hour.
- Push the controller to pass to the minute setup. Rotate the controller to setup minute.
- To exit the “Clock” item, keep the controller **(5)** pressed for two seconds.

Video output selection/Disabling video output
- Keep the controller pressed for two seconds and rotate to choose icon ⇥ in submenu M2.
- Push the controller and rotate to select video output standard – PAL or NTSC (video output is deactivated by default). To disable the video output, select **“OFF”.** Disabled video output reduces power consumption of the unit.
- Push the controller again to confirm.
- To exit main menu, keep the controller **(5)** pressed for two seconds. Or wait ten seconds to exit automatically.

Horizon adjustment function
Horizon adjustment function is designed to align the attachment horizontally relative to the reticle of your day weapon scope.
- Rotate the controller **(5)** to choose icon —✕— .
- Push the controller: vertical arrows will appear next to —✕— and a horizontal and a vertical line will appear on the display.
- Rotate the controller to move the horizontal line upwards/downwards so that it matches the horizontal bars of your day scope’s reticle. Vertical bars of the reticle should match the vertical line.
- If the lines do not match, release the clamp and re-mount the attachment to ensure its horizontal position. Check that the lines match, snap the clamp and tighten the screw.

Wireless remote control
The wireless remote control duplicates activation of the scope, IR Illuminator and Sum Light™ mode.
The unit has three buttons:
- “ON” button **(14)** – turning on/off the unit (keep pressed for two seconds to turn on the unit);
- “IR” button **(15)** - turning on/off the IR Illuminator, powers settings selection;
- “Sum Light™” button **(16)** – activation/deactivation of “Sum Light™” mode.

To start using the wireless remote control you will need to activate it:
- Turn on the unit, press the controller for tow seconds to enter the menu, select ᯤ icon.
- Press the controller **(5)**, a message **“WAIT”** will show up and countdown will start within which you need to press any button of the RC.
- If the activation is successful, a message **“COMPLETE”** will show up next to ᯤ icon. The RC is ready for use.
- If a message **“ERROR”** shows up, repeat the procedure. If the RC does not work, replace the battery. To do this, unscrew the screws on the rear panel of the RC, remove the cover, pull out the old battery and insert a new CR2032 battery.

Adjustment of the aiming point
Please see section 9 for details.

12 MOUNTING AND USING THE IR ILLUMINATOR

The attachment is supplied with an attachable laser IR Illuminator (915 nm wavelength) designed to operate in lowlight conditions and full darkness. The Illuminator operates in the invisible range which helps provide covert observation.
To attach the Illuminator, unscrew the plug **(4)**, mount the Illuminator into the grooves and screw the plug clockwise.
Adjustment:

- To adjust the required size and shape of the IR beam from spot to flood, rotate the lens holder **(12)** until you achieve quality image in your night vision device.
- If you need to adjust the IR spot position, turn the locking ring **(13)** 5-10 degrees counter-clockwise. Match the IR spot with the image viewed through a night vision device by moving the IR lens holder **(12)** transversely. Tighten the locking ring **(13)**.
  Note. On the right side of the attachment there is a Weaver rail **(25)** (optional) which allows attachment of auxiliary IR Illuminator or other accessories.

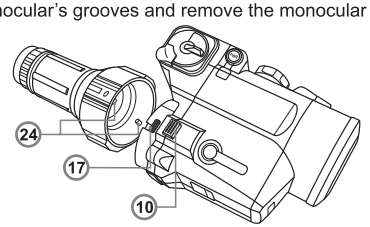
13 VIDEO OUTPUT

- Video output jack **(3)** is designed to connect external recording devices and transmitting video signal to a monitor.
- Select suitable video output signal – PAL and NTSC (see corresponding item of section “Main menu”).
- Attach signal receiver to the Video output jack **(3)** and turn on the attachment. Icon ⟶ on the panel will appear.
  If there is no connection (i.e. the cable is not connected) a warning prompt will be shown on the screen every three seconds.

14 USE OF THE ATTACHMENT WITH PULSAR 10X32 MONOCULAR

The attachment can be used with the Pulsar 10x32 (bought separately) which allows the attachment to be converted into a 10 power night vision digital observation device.
Installing the monocular:

- Insert the monocular tightly so that the pins **(24)** in the monocular’s body enter the notches **(17)** of the attachment (see pic.).
- Turn the monocular counterclockwise so that the lock **(10)** snaps.
- In order to remove the monocular, move the lock **(10)** sideways and turn the monocular clockwise until it clicks.
- Pull the pins out of the monocular’s grooves and remove the monocular carefully.



15 TECHNICAL INSPECTION

It is recommended that you inspect the unit before every use. Make sure to check for the following:

- Visually inspect that the unit is free from any physical damage; cracks, dents or signs of corrosion which may disqualify it from proper use.
- Check the sturdiness and proper fit of the mounting system.
- Ensure that the objective lens and the IR illuminator are free of cracks, grease spots, dirt, water stains and other residue before use.
- Visually inspect the condition of the battery and the battery compartment; the battery should be free of electrolyte and oxidation residue, especially where the battery makes contact with metal.
- Verify proper operation of the encoder, brightness adjustment knob and control buttons.
- Verify smoothness of the objective lens focus knob.

16 TECHNICAL MAINTENANCE

Technical maintenance should be done no less than twice a year, and comprises the following steps:

- Clean the outside metallic and plastic surfaces from dust, dirt and moisture; wipe the scope with a soft lint free cloth.
- Clean the battery compartment's electric contact points using an oil-free solvent.
- Inspect the objective lens and the IR illuminator and gently blow off any dust and sand, and clean using lens cleaner and a soft cloth; see section “GUIDELINES FOR OPERATION”.

17 STORAGE

Always store the unit in its case in a dry, well-ventilated space. For prolonged storage, remove the batteries.

18 TROUBLESHOOTING

Listed below are some potential problems that may occur when using the scope. Carry out the recommended checks and troubleshooting steps in the order listed. Please note that the table does not list all of the possible roblems. If the problem experienced with the scope is not listed, or if the suggested action meant to correct it does not resolve the problem, please contact the manufacturer.

problem	possible cause(s)	corrective action
The attachment will not turn on.	Batteries have been wrongly installed.	Reinstall the batteries respecting polarity.
	Oxidized contact points in the battery compartment due to “leaky” batteries or contact points becoming exposedto a chemically-reactive solution.	Clean the battery compartment, focusing on the contacts.
	The batteries are empty.	Install fresh batteries.
With a crisp image of the reticle, the image of the observed target that is at least 30 m away is blurred.	Dust and condensate are covering the outside optical surfaces of the attachment or the daylight sight.	Clean the lens surfaces with a blower and soft lens cloth. Let the attachment dry by leaving it in a warm environment for 2-3 hours.
The aiming point shifts after firing rounds.	The day sight is not mounted on the rifle securely. A different type of cartridges is used.	Check that the sight has been securely mounted, make sure that the same type and calibre cartridges are being used as when the sight was initially zeroed; if your sight was zeroed during the summer, and is now being used in the winter (or the other way round), a small displacement of the aiming point is possible. Check the aiming point (section 9).
The attachment will not focus.	Wrong settings of the day sight. Wrong settings of the attachment.	Make sure you have a clear image at 100 m in your day sight. Adjust the sight according to the instructions set forth in the Section 8 **“Operation”** and check the surfaces of the eyepiece and objective lenses and clean them if necessary from dust, condensation, frost, etc; to prevent fogging in cold weather, apply a special anti-fog solution.
The unit does not operate on external power supply.	Make sure your power supply provides output voltage. Make sure the central pin of the external power supply is intact.	Charge the power supply (if required). If it's necessary, unbend the pin to ensure electric contact.
The wireless remote control does not respond.	Remote control is not activated or wrongly activated. Battery is low.	Activate the remote according to instructions in section 10. Install a new CR2032 battery.
Barely visible texture which does not hinder detection range or efficiency of observation can be noticed on the display after the built-in laser IR Illuminator is activated.	This is normal for eye safe laser IR Illuminators.	This is not a defect.
The attachment slips off the sight when shooting.	The adapter is not tightened well enough. Wrong insert is chosen.	Choose the appropriate insert and tighten the adapter according to instructions.
The clamp of the adapter cannot be opened.	Wrong insert is chosen.	Choose the appropriate insert. Check the gap between the lips of the adapter.

problem	possible cause(s)	corrective action
The IR Illuminator is off the centre.	The beam of the IR is not adjusted.	Do the settings described in section 11 “Mounting and using the IR Illuminator”.
The display is off the centre.	The position of the attachment on your day sight is not adjusted.	Unclamp the clamp and set the display in the centre (see section 8 “Operation”).

Peculiarities of CCD array

CCD arrays employed in Pulsar digital night vision devices, feature high quality. However certain pixels (or groups of pixels) with increased luminosity (lighter or darker) are allowed. These defects can be seen when conducting observation not only in the nighttime but in the day time too, especially if Sum Light™ function is active. Presence of light and dark pixels and other minor defects of a CCD array (up to 4%) are acceptable in accordance with regulations of the array producer.
Visibility on the screen of light pixels also depends on the type of CCD array, heating temperature during operation.