



THERMAL IMAGING MONOCULAR WITH RANGE FINDER



DTM1000R

MANUAL

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**Attention! Before operating read attentively
the present manual!**

1. Package

Thermal imaging monocular	1 pcs.
Case	1 pcs.
Napkin to clean the lens	1 pcs.
Manual	1 pcs.

2. Precautions

IT IS IMPORTANT!

It is strongly forbidden to direct thermal monocular to the sun and other sources of intensive thermal radiation temperature of which exceeds 500 C°!

- Protect the device from direct shock.
- Don't wipe objective and eyepiece lenses with hard abrasive materials.
- Don't store the device with power sources.
- Use power elements of well-known producers.
- Reset of the device should be fulfilled after 20-30 sec after is has been off.

3. Purpose

The monocular is intended to observe movable and immovable objects, aiming shooting from hunting arm in conditions of various illumination and limited visibility (fog, dust, etc.)

4. Technical characteristics

Model	D1000R
Sensor, pixel/ detector pitch	384x288 / 17
Microdisplay: type / resolution, pixels	OLED / 1024x768
Focal length/aperture ratio	F40/1.0
Multiplicity, X	2,3
Angle of view, degr	9.3° x 7.0°
Digital zoom	x2, x4
Detection range (object 0.5x1.8m), m	Up to 1000
Range finder: measure distance, m	Up to 700
Spectral range, micrometer	8 - 14
Frequency, Hz	50
Color palette/inversion	10 types/ possible
Diopter adjustment, diopters	±4
Eye relief, mm	25
Voltage/Battery type	6 / 2 x CR123A
Operating time (+20°C), hours	2,5
Operation temperature range, °C	-20 ... +50
Degree of protection according to IEC 60529	IPX5
External power supply	possible, microUSB
Pre-installed Profiles /users	3+3
Various colors of aiming reticle	possible
Video recording	possible
WiFi	possible

5. Design and device

Pic.1

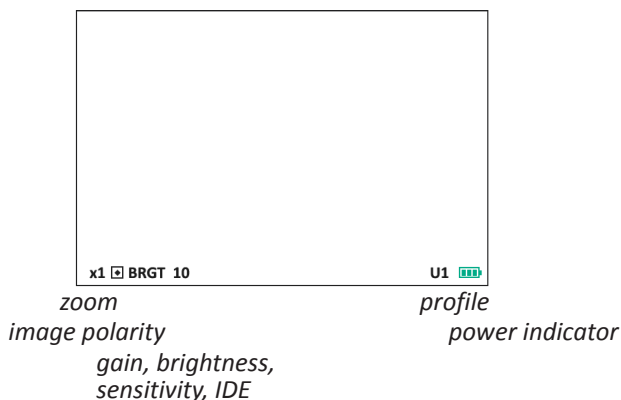


1. ON/OFF
2. Objective
3. Objective focusing handle
4. «MENU» handle
5. Eyepiece with diopter adjustment
6. On-indicator
7. Digital zoom button
8. Polarity change button
9. Video record
10. Hand belt
11. micro USB slot cap
12. Battery compartment cap
13. Range finder
14. Range finder control
15. Proximity sensor
16. Outer power source slot

6. Setting-up procedures and performance inspection

Unscrew the battery cap (12) and insert power elements according to the polarity, indicated on the body or unscrew USB slot cap (11) or outer power source slot cap (16) and switch outer power supply to the slot. Put off the cap from the objective (2). Please pay attention when using accumulator batteries as power supply charge indicator will display blue with letter «A».

Press ON/OFF (1) button wait till image appears in the eyepiece. Time of device switch doesn't exceed 5-7 seconds. On the download screen you will see the logo of company-producer, language and software after that the device will proceed to operating mode. Whole image on the screen in operating mode can be observed at pic. 2



Pic.2

With the help of diopter adjustment ring (5) reach maximal sharpness of an image. Follow the inscriptions and icons on the display.

After that direct the device to the chosen object and reach sharp image of the observed object by rotating focusing handle (3) of the objective.

If on-indicator (6) doesn't light or is blinking after switching, and there is no image of charge indicator/switched outer power supply in the eyepiece or it is blinking, may be, power elements or outer power supply are uncharged. You need to change power elements or external power supply.

7. Quick adjustments of the device

Display on/off.

For short-time display switching off at the operating device to save the charge shortly press ON/OFF (1) button. To switch on the device, press the button once again (1).

You can also adjust automatic display switching off when the device is away from the user's eyes. To activate the given function, you should turn to the corresponding part of the main menu.

Digital image increase.

Press step by step ZOOM (7) button and choose optimal increase of the observed image.

Image polarity.

Choose optimal polarity by INVERT (8) button: for instance, for black and white displaying of hot objects may be of black or of white color.

For colored palette color inversion is also possible.

Built-in range finder.

To measure the distance shortly press the button (14), after that viewfinder appears in the center of display. Correlate viewfinder with the chosen object and press the button once again (14). Hold the object in the viewfinder during 1-2 sec after that the result of distance measure up to the object appears on display valued in meters.

Please pay attention, in digital zoom x4 mode range finder doesn't work.

Video recording on/off and image presentation via WiFi.

To switch on video recording /presentation press shortly REC (9) button. In status line inscription «REC» appears, then digital record timer switches on. To stop it press the button once again. In details the process of video recording is described in main menu.

Pay attention, if power supply charge is too low video recording doesn't work. If during recording power supply charge becomes too low the record stops automatically.

Sensor gain, sensor sensitivity and microdisplay adjustment.

MENU (4) handle allows to adjust quickly brightness level of display (BRGT), sensor sensitivity (SENS), level of digital zoom (IDE), sensor gain (GAIN). Corresponding short name of parameter is displayed in the status line. Switching of modes is fulfilled by short pressing of the handle.

To adjust microdisplay brightness be sure that the given mode is active in the status line (BRGT) or shortly press MENU (4) handle to enter brightness control mode (BRGT. XX). Choose optimal level of brightness control by rotating the handle (4), adjustment is from 1 up to 30.

To adjust sensor sensitivity choose sensor sensitivity mode (SENS XX), the level changes from 40 up to 80. By rotating the handle (4) choose optimal level of sensor sensitivity. Use of this parameter allows to enhance image of objects with bright temperature contrast with the environment.

To adjust the image detail enhancement choose the corresponding mode (IDE X), the value of which reaches 0 up to 7. By rotating the handle (4) choose optimal zoom. The given parameter influences sharpness of images, decreasing blurring level and smoothing of displayed objects.

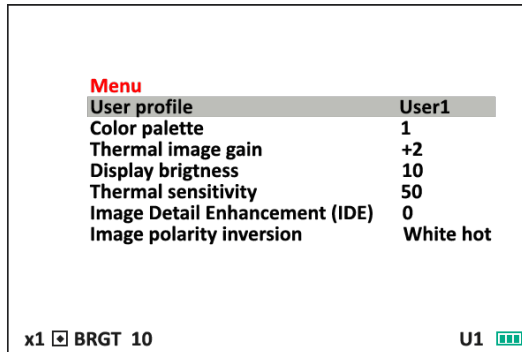
To adjust sensor sensitivity, choose the corresponding mode (GAIN XX, may vary from -10 up to +10), after that by rotating the handle (4) fulfill the adjustment. Adjustment of this parameter makes image better in case of small temperature contrasts of the observed object or phenomena with the environment.

8. Main menu


To enter Main menu.


To enter main menu press and hold MENU (4) handle till the menu appears in the field of view. Exit from main menu is fulfilled automatically after 15 sec of inactivity.

The look of main menu can be seen at pic.3



Menu	
User profile	User1
Color palette	1
Thermal image gain	+2
Display brightness	10
Thermal sensitivity	50
Image Detail Enhancement (IDE)	0
Image polarity inversion	White hot

x1  BRGT 10

U1 

Pic.3

To follow the menu you should rotate MENU(4) handle, to choose menu part - press MENU handle, to exit the part – press and hold MENU .

User profile

The given part allows to adjust quick change such parameters as color palette, thermal matrix gain, microdisplay brightness, thermal matrix sensitivity, digital zoom level, polarity.

The device has 3 pre-installed profiles: Fix 1 Woods, Fix 2 Mountains, Fix 3 City. By choosing them adjustment of the abovementioned parameters in the main menu is not available to the user. A user may adjust three profiles as he wishes: User 1, User 2, User 3. Adjustment is fulfilled at the same manner as type and color of aiming reticle (press and rotate MENU handle in the corresponding parts of the main menu), saving of the chosen adjustments is done automatically in the Profile.

Pay your attention, unlike operation adjustments done with the help of MENU handle while the device is working, after switching off the device the adjustments done through the menu are saved for user profiles.

Color palette

This part allows to choose from 1 up to 10 color palettes available, it will display during first download. Pay attention, adjustments of the chosen palette are saved after the device is off.

Thermal image gain

This part allows to adjust the level of thermal sensor gain. The process is described in details in the corresponding part *Quick adjustments of the device*.

Display brightness

This part allows to adjust brightness of microdisplay. The process is described in details in the corresponding part *Quick adjustments of the device*.

Thermal sensitivity

This part allows to adjust level of thermal sensor sensitivity. The process is described in details in the corresponding part *Quick adjustments of the device*.

Image Detail Enhancement (IDE)

This part allows to adjust level of image zoom. The process is described in details in the corresponding part *Quick adjustments of the device*.

Image polarity inversion

Allows to choose polarity : White Hot or Black Hot (similary pressing INVERT button. For colored palette color inversion is also possible.

USB transfer mode

The given part allows to copy and delete video files from the built-in memory card. When choosing the given mode, the following inscription appears on the screen «Establishing connection...» after that the device is seen as flash drive.

When entering this mode to save energy power from thermal matrix is off, video record modules (if they were working) switch off and WiFi (additional time may be needed to connect).

To exit the given mode switch off the device.

WiFi

While activating the given part of the menu during video recording simultaneous broadcasting of video is possible in real time via a computer or smartphone with WiFi.

The device creates POP with serial number of the device and password: 12345678.

For to watch video online, you may use any player with RTSP video available (for example, VLC player). You should install playback from the following address `rtsp://192.168.0.110` Playback starts after pressing REC button (in the status line record timer and WiFi icon appear).



Video recording mode

In this part you may choose modes of video record/ broadcast of video: *Normal start* or *Quick start*.

In Normal start mode video record/ broadcast of video starts a bit after pressing REC button, it is needed to switch on corresponding module and software download (up to 10 sec).

In Quick start modules are activated during the device is switched on and record/broadcast of video starts more quickly after pressing REC (up to 5 sec) button, but keeping the modules in active status considerably increases power consumption.

Signs in status bar during video recording process:

REC (blinking)		- recording module turns on
REC 00:00:00		- recording module ready for record
REC ● 00:01:20		- recording process
REC Saving		- data saving on internal SD-card

Pressing and holding for several seconds REC button allows to switch off video module and to lower power consumption, but after that it takes some time for the device to start video record /broadcast – as it happens with Normal start mode.

Date and time stamp position

It allows to indicate date position and video recording time into the built-in memory card (it is not displayed).

Super contrast display mode

Allows to install higher level of contrast of microdisplay.

Proximity sensor

Activates function of microdisplay switching off when it is away from the user's eye to save power or to avoid demask.

Proximity sensor range, mm

Allows to install the distance when function of microdisplay auto switching is activated.

Auto bad pixel correction

Start of the mode for defected pixels autocorrection.

Pay your attention that device objective must be closed by the cap during the process. After the process press and hold MENU (4) handle to save changes or shortly press MENU handle to cancel changes.

Bad pixel correction

This mode allows to remove isolated defected pixels or group of them manually. Please pay attention that correction of the group of defected pixels should be fulfilled from the edges to the center by narrowing the radius step by step.

Rotation of MENU handle allows to change cursor position (during constant rotation the pitch of cursor shift increases), short pressing of the handle allows to change coordinate axis. After the cursor stands together with the defected pixel shortly press ZOOM button after that defected pixel changes its color.

If necessary, repeat the procedure with other defected pixels. To save the changes press and hold for a long time MENU handle.

LRF reading position

In this part you may choose position of object distance displayed by range finder.

Status bar position

Allows to choose position of status line on the screen of the device.

Status bar delay time,s

In this part you may choose time (in seconds) of control inactivity when status line disappears from the display.

Menu position

Allows to choose position of menu on the screen.

OSD transparency

In this part you may choose level of interface transparency to lower “burning” of microdisplay with static image.

Auto power off, minutes

Allows automatically turns off the device after selected time of inactivity.

Language

Allows to choose interface language. Russian, English, Deutch, Spanish are available.

Date set

In this part you may install the date displayed during video recording or video broadcast. Values are installed by pressing and rotating of MENU handle.

Please note, date and time settings don't go wrong after switching off and putting out of power elements from the device. But if the device hasn't been on for a long period of time (more than 4 months), date and time settings may be wrong.

Time set

It allows to set the date displayed during video recording or video broadcast. Values are installed by pressing and rotating of MENU handle.

Distance unit

This part installs measure values (meters, yards) for built-in range finder.

Hardware version

Shows the version of device hardware.

Software version

Shows the present version of device software.

Settings reset.

It means coming back to factory settings (doesn't touch calibrating values of range finder and parameters of users' profiles).

Please note, during video recording reset is impossible!

9. Use of additional accessories

There is a possibility to connect outer power source with voltage of 10...14,6 V (car embedded network) or portable outer power supply with voltage of 8-14,5 V and slot JACK 2.1 slot through the slot (17).

There is also a possibility to connect outer power supply through micro USB (11).

10. Possible defects and methods of their removal

Your monocular is a complicated optomechanical device. Its repair and technical service may be fulfilled only in conditions of the company – producer or any authorized service center.

If after switching on the on-indicator (6) doesn't light or is blinking and the image is absent or is blinking in the eyepiece, may be, power elements are discharged or contacts in the battery compartment are broken. Change power elements and examine contact at battery cap (12) and contact inside the battery compartment. There should be no traces of corrosion or any dirt.

If changing of power elements and cleaning of contacts doesn't help as well as in case of any other defects and malfunctions of the monocular don't try to disassemble and to repair it by yourself. Turn to the Vendor or company-producer, the address is indicated at the end of the given Manual.

Please, pay your attention that maximal operating time of the device is reached when using power elements of the recommended producers at $t +20^{\circ}\text{C}$. When using power elements of the unknown producers, as well as when operating in winter operating time of the device may decrease and it doesn't mean technical fault.

11. Storage and transportation

The device should be stored in the case, in dry warm and aired room with the relative humidity up to 80% at temperature 5°C - 30°C. There shouldn't be any acidity, alkali and other aggressive fumes in the air. Even while short-time storage put out power elements from the device.

When preparing for long-term storage you should do the following things:

- put the lubricant SOI-54p (GOST 3276-74) to the nonpainted metal parts,
- lubricate the thread of the battery compartment cap, inner contact of the battery compartment by lubricant SOI-54p (GOST 3276-74),
- dry the device.

The device can be transported by any means of transport, preferably in closed vehicles according to transportation rules stated for the given vehicle. Conditions of device transportation are determined according to climatic factor influence due to group 5 (OZ4) in accordance with GOST 15150-69 (at the temperature of - 50 up to +50 °C, with the relative humidity of not more than 98 % at 25 °C).

12. Acceptance certificate

Thermal imaging monocular

Serial №

Sensor №

Release date

Representative of quality control department.....

13. Warranty

Company-producer guarantees that quality of thermal monocular corresponds to technical demands if storage, transportation and operation rules and conditions described in the present manual are adhered to.

Warranty period constitutes 12 months.

Company-producer repairs the device or changes it in case of producer-caused failure during warranty period.

14. Company-producer

Scientific-productive firm «Dipol»

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Notes

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