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DORS® 1170

MULTIFUNCTIONAL COUNTERFEIT DETECTOR

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Production date:

USER MANUAL

User Manual
Rev 0 Int

FOR NOTES

CONTENT

Thank you for purchase of the multifunctional detector **DORS 1170D**.

READ THIS MANUAL THOROUGHLY BEFORE OPERATING THE DEVICE!

BRIEF INFORMATION FOR CUSTOMER

The multifunctional detector **DORS 1170D** is developed in **Russia by DORS R&D** and is assembled in China by **DORS Industries (China) Ltd.**,

Service term is 7 years*.

* Under condition that detector is being used in strict accordance with this user manual and applied technical standards.

THE PURPOSE OF THE DETECTOR

The multifunctional detector **DORS 1170D** (henceforth – the device) is designed for visual detection of authenticity of banknotes and security printing documents with protective marks that can be verified by this device.

Device features

The device is equipped with:

- 7" colour LCD TFT display,
- Infrared camera that transmits to the display a general view of banknote (document) placed closely to the device,
- Source of infrared (IR) light (850nm and 940nm) intended to illuminate the viewing area of general view camera,
- 10x camera that transmits to the display a magnified view of a part of banknote (document),
- Source of IR, white, and ultraviolet (UV) lights intended to illuminate the viewing area of 10x camera,
- Digital video output for connection to PC using an USB interface.

The device helps to:

1. Check the presence of IR images in reflected light, including a mode of interchangeable wavelengths (940nm and 850nm).
2. Check an authenticity of security elements made by Orloff intaglio printing (these elements can be printed in several colours or by metameric ink).
3. Check the presence of intaglio printing at the certain elements of a banknote.
4. Check the presence and authenticity of banknote's microperforation.
5. Check the banknote's general luminescence under UV light.
6. Verify the UV images (pictures, protective threads and fibers).
7. Transfer the image from device's screen to PC for examination and saving for a further reference.

The viewing area of 10x camera is available for examination by naked eye. It allows to combine a visual control of UV images and a control by means of device's sensors.

The device has the only button that makes its usage fast and simple.
The device can be used by a cashier that has been trained to verify an authenticity of banknotes – upon a condition that this manual has been read attentively.

IMPORTANT INFORMATION!

Safety precautions:

IT IS PROHIBITED TO TOUCH THE DEVICE AND THE POWER CORD PLUG WITH WET HANDS. IT MAY RESULT IN AN ELECTRIC SHOCK.

WARNING! TO AVOID ANY DAMAGE OF THE CABLE OR ITS BREAK, UNPLUG THE POWER CORD FROM THE POWER OUTLET BY GETTING HOLD OF ONLY THE PLUG.

ATTENTION! IF THE DEVICE HAS BEEN UNDER COLD CONDITIONS FOR A LONG TIME, IT SHALL BE KEPT UNDER ROOM TEMPERATURE FOR NOT LESS THAN TWO HOURS BEFORE ITS SWITCHING ON.

ATTENTION! TO PROVIDE A SUCCESSFUL OPERATION OF THE DEVICE FOR A LONG TIME WITHOUT A SERVICE ENGINEER'S INTERFERENCE, PLEASE OBSERVE THE FOLLOWING RULES:

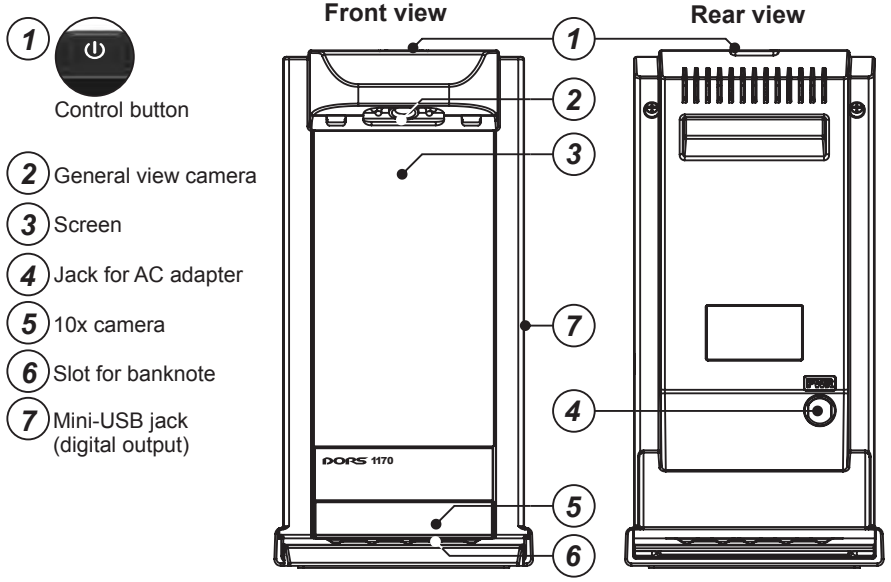
- **THE DEVICE SHALL BE INSTALLED ON AN EVEN HORIZONTAL SURFACE;**
- **WHEN INSTALLING THE DEVICE, AVOID ITS EXPOSURE TO DIRECT SUNLIGHT AND ARTIFICIAL SPOT LIGHT.**

DELIVERY SET

Multifunctional counterfeit detector DORS 1170D..... 1 pc.
AC adapter..... 1 pc.
User manual..... 1 pc.
Packaging..... 1 set

APPEARANCE AND KEY COMPONENTS OF THE DEVICE

Fig. 1. Appearance of the device



Control button (item 1 of Fig.1) is intended for switch on / off the device, for switching between general view camera and 10x camera. The button is sensitive to three types of touch: short, long, and double.

Screen (item 3 of Fig.1) is designed to display the general view of banknote under IR light or the part of banknote with 10x magnification. Besides, the symbol of current mode is indicated in the left bottom corner of the screen.

General view camera (item 2 of Fig.1) captures the full-size image of banknote for its further displaying on the screen of device. To examine a banknote, put it on the table close to detector's base or hold it in hands. The camera produces the picture in infrared light that allows a user to watch the infrared image of a banknote. The general view camera is equipped with 2 sources of IR light (at wavelengths 850nm and 940 nm). If a banknote has a security element which image at 850nm is different of that at 940nm (for example, US dollars), a user has to activate a mode of blinking IR (i.e. interchangeable turning on both sources). Therefore in blinking IR mode a user sees on the display a blinking of such security element.

Slot for banknote (item 6 of Fig.1) is designed to insert a banknote (short size forward) in order to examine it with 10x magnification or to verify its UV image. Once a banknote is inserted into the slot, the screen automatically displays an image captured by 10x camera. If there is no banknote in the slot, the screen displays an image from the general view camera.

10x camera (item 5 of Fig.1) is located just above the slot. A user can see the viewing area of 10x camera through a transparent glass of a front panel of detector. This camera is equipped with 3 sources of light in order to verify the different security features:

- **Double-sided white** oblique light allows to examine a microstructure of a printed layer of a banknote, including tangier grids and guilloches, and microlettering as well. 10x magnification is good enough for verification of Orloff intaglio printing. Due to small angle of incidence of a beam, user can see relief and structure of paper's surface, a height of printing layer's relief, and a microperforation. When white light is on, user can see a banknote through a transparent glass and find faster a fragment for examination with a magnification.
- **Double-sided IR** oblique light allows to examine IR images and their microstructure. IR light applied together with white light helps to verify an authenticity of Orloff intaglio printing made by metameric ink, and makes visible a raised relief of paper in the areas covered by metameric ink to verify an authenticity of intaglio printing.
- **UV light** at wavelength 365nm makes visible UV images and a banknote's general luminescence under UV light. This control mode allows to watch a microstructure of UV images, including luminescent fibers of paper. Looking through a transparent glass, user can move a banknote to examine certain elements of UV images.

Digital video output (item 8 of Fig.1) is designed to transfer a picture from device to PC through mini-USB cable. If the relevant driver is installed on PC, the latter recognizes the device as a video source. The transferred picture can be displayed on PC's monitor and can be saved as digital image or video file.

The text messages displayed on the screen of device (refer to Fig.4) do not transferred through the digital video output.

PREPARING FOR OPERATION

Take the detector out of its package and install it on a desk thus a screen of device faces a user. Provide a free space in front of detector in order to place a banknote inside a viewing area of general view camera, as well as behind a device to let a banknote pass through the slot.

If it is supposed to transfer a picture from device to PC, connect mini-USB jack of device to USB port of PC using relevant cable (a cable is not included in the delivery set). Install to PC a special driver that can be downloaded from DORS web site.

To start the device operation, connect the supplied AC adapter to the power jack of the device (**item 4 of Fig.1**) and plug AC adapter to power supply 100 -240V ~50/60 Hz. Then switch on the device by long press (about 1 second) on the control button (**item 1 of Fig.1**). The screen of device shall turn on to show that the device is switched on and ready to operation.

OPERATION

You can choose the operation mode by putting a banknote on the table close to detector's base (general view mode, **refer to Fig.2**) or by inserting a banknote into the slot (zoom mode, **refer to Fig.3**). Depending on a position of a banknote, the device chooses the required operation mode automatically. To choose a certain source of light in any operation mode, use the control button. The list of available types of control is given in Spreadsheet 1.

Spreadsheet 1

Operation mode & type of light	Position of a banknote	Type of camera	On-screen indication of a control mode
General view mode, IR control (both 850nm and 940nm)*	Before the device	General view camera	1x IR
General view mode, IR blinking control (interchangeable 850nm / 940nm)			1x IR BLINK
Zoom mode, White light control*	In the slot	10x camera	10x WHITE
Zoom mode, Control of intaglio printing by metameric ink (interchangeable white light and IR light)			10x INTAGLIO
Zoom mode, IR control			10x IR
Zoom mode, UV control			10x UV

*** This type of light is activated after the device is switched on.**

Fig.2 General view control mode

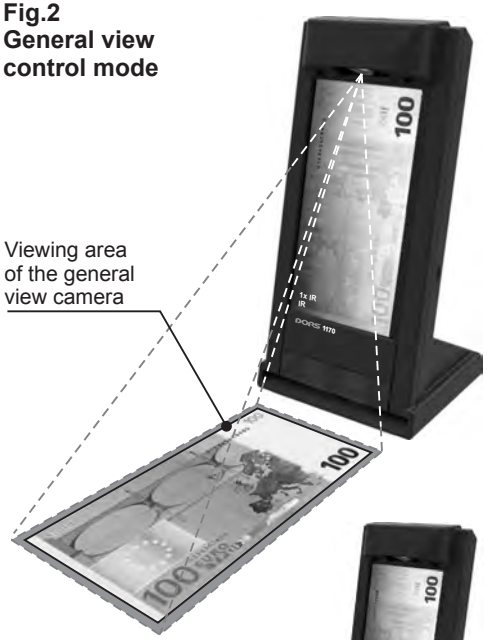


Fig.3 Zoom control mode

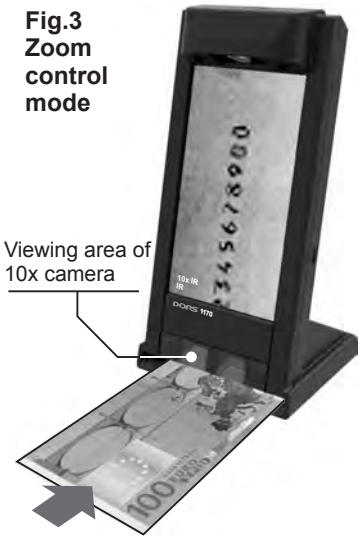


Fig.4. Indication of an operation mode and a type of control on the screen of device

Fig.4 shows where on the screen the messages are indicated.

The functions of the control button (item 3 of Fig.1):

1. If the device is switched off, the long pressing of the control button (about 1 second) switches it on.
2. In the general view mode (**refer to Fig.2**), a short pressing of the control button switches the device between IR control and IR blinking control.
   - **IR control** (**1x IR**) is supported by wideband infrared light (830nm to 960nm).
   - **IR blinking control** (**1x IR BLINK**) is supported by interchangeable infrared light (850nm / 940nm). If a banknote has IR blinking mark, the latter appears and disappears on the screen of device.
3. In the zoom mode (refer to Fig.3), a short pressing of the control button subsequently switches the following types of light for 10x camera:
   - Permanent white light (**10x WHITE**),
   - Interchangeable light for control of intaglio printing by metameric inks (**10x INTAGLIO**),
   - Permanent IR light (**10x IR**),
   - Permanent UV light (**10x UV**).

   Then these types of light are repeated by cycle. Double click on the control button reverses the sequence.
4. If the device is switched on, the long pressing of the control button (about 1 second) switches it off.

Note: The status of a light source is saved separately for the general view mode and for the zoom mode. When you re-enter an operation mode, the status of its light source is restored automatically.

DESCRIPTION OF THE TYPES OF CONTROL

IR control

Place a banknote to be verified close to detector's base. Do not expose a banknote under a direct sunlight or artificial spot light. Otherwise an examination of IR image will be difficult or even impossible. Activate IR control (a message «1x IR» is appeared on the screen of device). Examine IR image of a banknote on the screen of device. Compare IR image on the screen with that of genuine banknote of the same denomination and generation.

IR blinking control

Place a banknote to be verified close to detector's base. Do not expose a banknote under a direct sunlight or artificial spot light. Otherwise an examination of IR image will be difficult or even impossible. Activate IR blinking control (a message «**1x IR BLINK**» is appeared on the screen of device). Examine IR image of a banknote on the screen of device. IR images should distinctly blink approx. 2 times per second.

Control of IR images made by intaglio printing

Insert a banknote to be verified into the slot. Activate the control of intaglio printing (a message «**10x INTAGLIO**» is appeared on the screen of device). Looking at the viewing area of 10x camera, check whether an IR image made by intaglio printing is visible. A part of such IR image is printed by IR-transparent (metameric) ink, while its other part is printed by IR-non-transparent ink. Make sure that A) on the screen of device a part of such IR image is completely disappeared and re-appeared while its other part is always visible; B) thin lines of image continue without interruptions or steps.

Control of intaglio printing

Insert a banknote to be verified into the slot. Activate the control of intaglio printing (a message «**10x INTAGLIO**» is appeared on the screen of device).

Looking at the viewing area of 10x camera, check whether an image with a raised relief printed by IR-transparent (metameric) ink is visible. Make sure that A) when an image on the screen is disappeared, on its place you see a raised relief of banknote's paper; B) a raised relief is situated on the same place and has the same shape that an image on the screen. This type of control can be combined with a detailed control of IR images.

Control of Orloff intaglio printing made by multicolor inks

Insert a banknote to be verified into the slot. Activate the white light control mode (a message «**10x WHITE**» is appeared on the screen of device). Looking at the viewing area of 10x camera, check whether a fragment of a banknote printed by Orloff intaglio printing with multicolor inks is visible. This area has the image(s) printed in two colors in such way that the lines suddenly change their colors without interruption or step or blur. Carefully examine the contacts of sections of different colors. This type of control is also available in the intaglio printing control mode (a message «**10x INTAGLIO**» is on the screen).

Control of microperforation

Insert a banknote to be verified into the slot. Activate the control of intaglio printing (a message «**10x INTAGLIO**» is appeared on the screen of device). Looking at the viewing area of 10x camera, check whether a microperforated fragment is visible. You need to see on the screen at least 4 holes of microperforation. Make sure that: A) all these holes are equal in size, have even edges, with no prominent fibres, with no traces of burning, B) there is no raising relief around a hole.

Control of microlettering

Insert a banknote to be verified into the slot. Activate the control of intaglio printing (a message «**10x INTAGLIO**» is appeared on the screen of device). Looking at the viewing area of 10x camera, check whether a fragment with microlettering is visible. Make sure that the microlettering on the screen is readable, its content matches this type of banknote, the lines have no interruption or ink spreading. The information on location and content of microlettering at certain banknote is available on web site of the relevant Central Bank. This type of control is also available in the white light control mode (a message «**10x WHITE**» is on the screen).

UV control

Insert a banknote to be verified into the slot. Activate the UV control mode (a message «**10x UV**» is appeared on the screen of device).

- Looking at the viewing area of 10x camera, check whether a fragment with UV image is visible. Watch UV image, pay attention to a color of its luminescence. Make sure that UV image on the screen matches this type of banknote. The information on location and content of UV image(s) at certain banknote is available on web site of the relevant Central Bank.
- Looking at the viewing area of 10x camera, check whether a fragment without UV images is visible. Make sure that there is no background luminescence of a banknote. A counterfeit note usually has bright background luminescence (white or light blue).
- Looking at the viewing area of 10x camera, find a fragment with a luminescent fibre. Such fibres are distributed over a surface of a genuine banknote in a random way. Watch a fibre on the screen. It should look thin, even, and well-shaped. It's allowed that a fibre has a brightly luminescent thickening with sharp edges. If a fibre is too thick and its edge is uneven and blur, it can testify that this fibre is forged.

Switching off the device

Press the control button by long touch, upon that the screen of the device has to be faded. Take the AC adapter off the electrical socket.

Maintenance

To clean the soiled surfaces of the device, use a neutral water-based detergent (like dishwashing liquid) or a cleaning stuff based on isopropyl alcohol. A surplus of detergent or cleaning stuff should be carefully removed from the surfaces of the device.

WARNING! BEFORE A CLEANING OF DEVICE'S SURFACE, MAKE SURE THE AC ADAPTER HAS BEEN REMOVED FROM THE ELECTRIC SOCKET!

WARNING! TO AVOID AN ELECTRIC SHOCK, PREVENT A PENETRATION OF A DETERGENT OR A CLEANING STUFF INSIDE THE DEVICE!

WARNING! WHEN YOU CLEAN THE SURFACE OF DEVICE, USE ONLY A SOFT TISSUE TO APPLY A DETERGENT OR A CLEANING STUFF. IT IS PROHIBITED TO USE A BRUSH, A SPRAYER OR AN AEROSOL SPRAY TO APPLY A DETERGENT OR A CLEANING STUFF.

TROUBLESHOOTING

The device fails to switch on (the screen doesn't light).

Check the device connection to AC adapter. Remove AC adapter from electric socket, wait one minute, then insert again the adapter into electric socket, and try to switch on a device. If the device still fails to switch on, call your supplier.

SPECIFICATIONS

Supply voltage of AC adapter ..... 100V – 240V, 50/60 Hz
Current consumption of AC adapter..... 0.15A – 0.06A
Supply voltage of detector ..... 5V DC
Current consumption of detector ..... not more than 1.5A
Net weight (incl. AC adapter) / gross weight ..... 0.32kg / 0.54kg
Overall dimensions (Width x Depth x Height): .. 122x111x245 mm
Width of the slot for banknote ..... 114 mm
Screen size..... 7” (177mm)

Linear magnification on the screen:

general view camera 1x
10x camera ……..... 10x
Light sources of general view camera:
IR mode ..... wideband 830nm - 960nm
IR blink mode ..... 850nm / 940nm
Light sources of 10x camera:
IR mode ..... double-side oblique 940nm
Visible mode ..... double-side oblique white light
UV mode ..... direct 365nm
Power of the laser 50mW
Digital video output interface..... USB 2.0
Operating temperature..... +5 oC to +35oC
Relative humidity of the air at +25°C..... 40% to 80%
Atmospheric pressure..... 84kPa to 107 kPa

TRANSPORTATION, STORAGE AND DISPOSAL

The device shall be transported in its standard package by sea (in containers), by railway (in closed wagons), by air (in a pressurized baggage or a cargo compartment), and by truck (in an enclosed body or in a container under a waterresistant tent along the public paved roads). The transportation conditions are temperature – 30°C to + 50°C, relative humidity up to 95 % without water condensation at +25°C, atmospheric pressure 84 to 107 kPa (630 to 800 mm Hg).

The device shall be stored in its package in a heated warehouse at temperature +10°C to +25°C, at relative air humidity not exceeding 80%.

The device meets the requirements of the European Union's RoHS Directive which decreases the environmental pollution by hazardous substances. The device may be disposed as a domestic waste.

SUPPORT AND WARRANTY

The manufacturer guarantees 12 month of the device operation since the moment of its purchase. The manufacturer by means its local dealer is obliged to repair the failed device if the user has observed all the requirements of this User Manual.

FOR NOTES