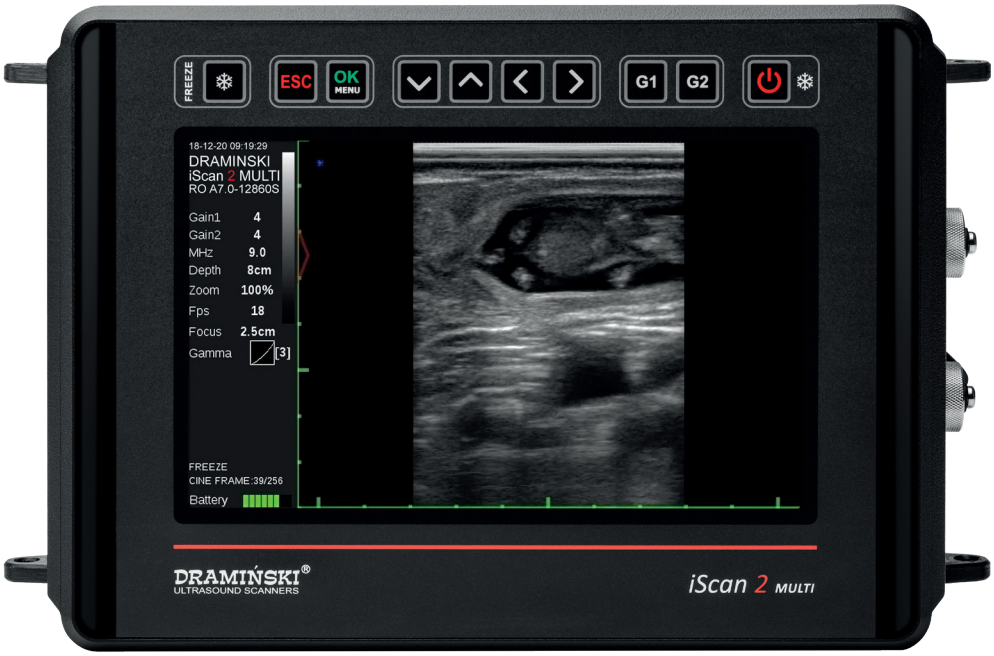
DRAMIŃSKI
TECHNOLOGY

iScan 2 MULTI



Instructions for Use (IFU)

www.draminski.com

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Declaration of conformity
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We wish you and the users of the product a lot of success in taking care of your patients. We are sure that with our product you will be able to provide good care for your patients. DRAMIŃSKI will be glad to receive your feedback regarding the device and this manual.

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1. Introduction

1.1. Information about the user guide of the device

The individual sections of the user guide describe design, accessories of the device, preparing it to operation, functions and use of the ultrasound scanner. Before starting to use the ultrasound scanner, please read carefully the user guide.

Reading the content of the user guide does not substitute even basic ultrasonography training. We recommend the user to take an authorized ultrasound training.

1.2. Warnings, comments and symbols used in the user guide

This user guide uses the following distinguishing signs to emphasise important information:

Warning! Pay particular attention to safety of the patient or of the device user.

Attention! - Pay attention to the safety of the device or its proper operation.

Bold text - To draw attention to important fragments in the user guide or to make the information clearer and more legible.

Descriptions of diagrams and figures to make details more visible.

The symbols used in the user guide do not provide complete information about safety instructions. Therefore, the safety instructions (section 2) must be read first and followed!

Symbols used in the text:

<x.x.x> – reference to section x.x.x

(option) – availability of the feature depends on the version of the device or its equipment

1.3. Preliminary information about iScan 2 MULTI – a portable ultrasound scanner

The iScan 2 MULTI ultrasound scanner is intended for diagnostics of animals, in particular of livestock. It can be used for examination of reproductive system, lungs, parts of digestive system, and others, as well as for determination of breeding value.

The ultrasound scanner can work with various linear and convex probes, e.g. backfat probe and OPU system.

2. Safe use

Warning! User and patient safety depends on the compliance with the following guidelines!

1. DRAMIŃSKI iScan 2 MULTI is a device that should be used only by qualified personnel for diagnostic purposes.
2. The ultrasound scanner and its equipment should be disinfected after their potential contact with contagious substances.
3. The ultrasound scanner cannot be used simultaneously with other high frequency devices (HF).
4. The users of the ultrasound scanner are recommended to have regular technical inspections performed by the manufacturer every two years.
5. It is forbidden to dismantle the device and perform repairs and adjustments on one's own, except the activities described in the user guide.
6. The users of the ultrasound scanner are recommended to regularly check the probe cable and the point where it is connected to the ultrasound scanner against mechanical damage.
7. If mechanical damage of the probe or the cable is identified, the device needs to be sent to the service center.
8. The ultrasound scanner has a sturdy design, however, in order to avoid mechanical damage, please, follow the instructions specified in this section of the user guide.
9. Avoid exposure of the device to strong sunlight. It is recommended to observe the temperature specified on the labels of the device and its components.
10. The user is forbidden to introduce any modifications to the device.
11. DRAMIŃSKI iScan 2 MULTI is an electric device that can be the source of electromagnetic radiation. Its operation can be disturbed by other electric devices, that is why it is recommended to limit the number of electric devices in its vicinity as much as possible.
12. When the device and its accessories reach their lifetime, due to the risk for the environment, they should be recycled by specially qualified entities in accordance with the applicable legislation or returned to the manufacturer.

3. List of components of DRAMIŃSKI iScan 2 MULTI ultrasound scanner

Item	Name and description	Quantity
	Standard equipment	
1	Ultrasound scanner	1
2	Ultrasound probe	1
3	External battery	1
4	Battery charger with a 230 V charging cable	1
5	USB storage adapter	1
6	Suspenders	1
7	Transport case	1
8	User guide on a USB drive	1
	Additional equipment*	
9	Goggles	option
10	WiFi antenna	option
11	Screen sun shield	option
12	Linear rectal probe extension for cattle	option
13	Linear rectal probe extension for sheep	option
14	Battery support	option
15	Gel stand-off	option
16	OPU holder	option

*Ask your sales representative about availability.

Any additional accessories for use with the iScan 2 MULTI ultrasound scanner are available upon agreement with the vendor.

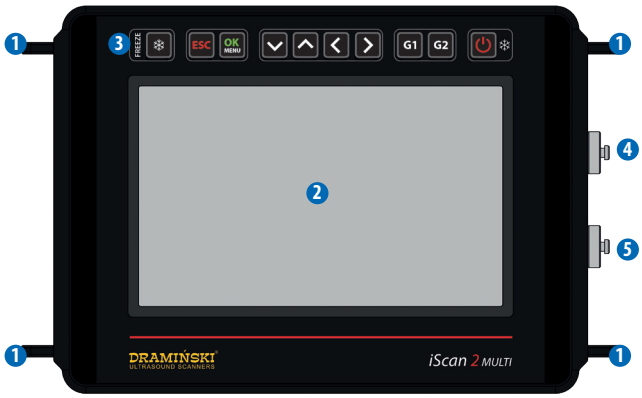
4. Design of the iScan 2 MULTI ultrasound scanner

Attention!

The ultrasound scanner has a sturdy design. However, during operation and transportation, caution is necessary in order not to subject the device to strong impacts to avoid damaging it. The sockets should be protected against dirt and moisture.

4.1. Casing

The view and description of the elements of the casing:

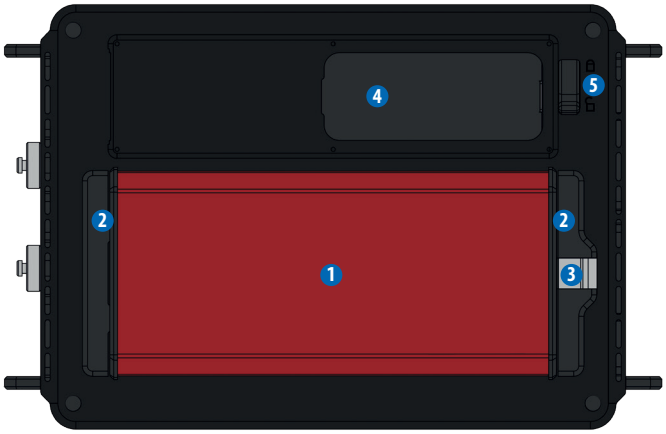


Casing. Front view.

1. Hooks for suspenders
2. Screen
3. Keyboard
4. Goggles connection socket
5. Data transfer socket

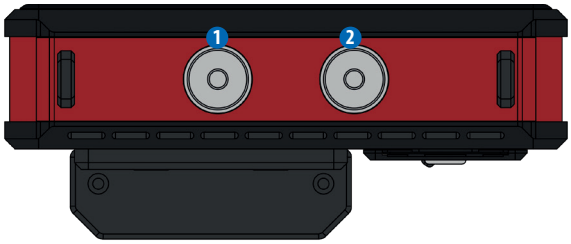
Keyboard

1. Freeze
2. Exit
3. Confirm / Menu
4. Navigation buttons
5. General / overall gain
6. Far field gain
7. ON / OFF / Freeze



Casing. Rear view.

1. Battery
2. Battery attachment system
3. Latch
4. Probe socket protection slide
5. Probe socket lock



1 Data transfer socket
2 Goggles connection socket

Casing. Right view.

4.2. Probe

The iScan 2 MULTI ultrasound scanner can work with various probes. The compatible probes are listed below. Software update can increase the number of compatible probes. Ask your sales representative about the valid list.

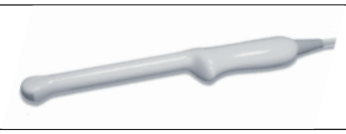
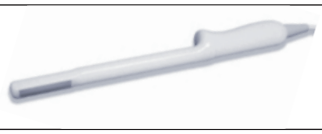
List of compatible probes:

Name	SH RL4-9/60	AL L6-14/40
Type	Linear rectal	Linear abdominal
Centre frequency [MHz]	7,0	10
Frequency range [MHz]	4-9	6-14
Scanning depth range [mm]	40-150	40-100
Probe head (L – length, R – radius) [mm]	L60	L40
Angle	n/d	n/d
Number of elements	128	128
Name	**SH C2-8/50R**	**SH C2-5/60R**
Type	Abdominal convex	Abdominal convex
Centre frequency [MHz]	5,0	3,5
Frequency range [MHz]	2-8	2-5
Scanning depth range [mm]	60-300	60-300
Probe head (L – length, R – radius) [mm]	R50	R60
Angle	73,3	60,3
Number of elements	128	128

Name	GR MC4-9/11R	AL C4-9/15R
Type	Abdominal microconvex	Abdominal microconvex
Centre frequency [MHz]	6,5	6,5
Frequency range [MHz]	4-9	4-9
Scanning depth range [mm]	40-150	40-150
Probe head (L – length, R – radius) [mm]	R11	R15
Angle	139,4	93,76
Number of elements	128	128

Name	AK RC3-7/60R	AK RC4-9/20R
Type	Rectal convex	Rectal microconvex
Centre frequency [MHz]	5,0	5,0
Frequency range [MHz]	3-7,5	4-9
Scanning depth range [mm]	60-250	60-300
Probe head (L – length, R – radius) [mm]	R61	R20
Angle	64	120
Number of elements	128	128

Name	SH BF2-5/150	SH BF2-5/180
Type	Backfat	Backfat
Centre frequency [MHz]	3,7	3,7
Frequency range [MHz]	2-5	2-5
Scanning depth range [mm]	60-300	80-200
Probe head (L – length, R – radius) [mm]	L147	L180
Angle	n/d	n/d
Number of elements	128	128

Name	SH EC4-9/10R	SH EC4-9/40
Type	Endovaginal	Linear rectal
Centre frequency [MHz]	6,5	7,5
Frequency range [MHz]	4-9	4-9
Scanning depth range [mm]	40-150	40-150
Probe head (L – length, R – radius) [mm]	R10	L40
Angle	150,3	n/d
Number of elements	128	128
		

4.3. Battery

Warning!

The battery can be charged only with the charger supplied by the manufacturer.

The ultrasound scanner is powered by a rechargeable Li-Ion battery. The battery has an internal thermal fuse protecting it against overheating during charging.

The battery casing has a socket to connect the charger cable and special contacts to be connected to the ultrasound scanner.

The battery is installed at the bottom of the ultrasound scanner. <5.2>

1 Contacts for ultrasound scanner connection

2 Charger cable socket

Battery

Safety measures for handling a Li-Ion battery pack:

- Never dismantle the battery pack which forms an integrated unit.
- Never short-circuit contacts in the battery pack casing using metal items.
- Do not throw battery packs into the fire nor heat them up.
- Never expose the battery packs to mechanical impact. Do not throw them.
- If you notice electrolyte leakage, stop using the battery pack immediately.
- Never allow liquid to penetrate the battery pack, it may cause a sudden temperature rise and a danger.

- Battery packs should not be left in high ambient temperature, for example, inside a car directly exposed to sunlight, or near a source of heat. Failure to follow these principles can cause leakage of electrolyte from the battery and its damage or shorten its service life.
- The battery should be charged in ambient temperature of 0°C to 40°C. Charging the battery in different ambient temperature can be dangerous and result in permanent damage to the battery pack.
- If there are problems with charging after a long service period (approx. 500 cycles), the battery pack needs to be replaced with a new one.
- The used battery pack should be recycled in accordance with the applicable legislation.

4.4. Charger

Charger

Mascot charger, type 2440, is intended only to charge the batteries of the iScan 2 MULTI ultrasound scanner.

It is adopted to the mains 110-240 V / 60 Hz.

A colour diode indicates the battery charging level. The red colour means that the battery is discharged, the green colour means that the battery is charged.

Warning! It is forbidden to perform any unauthorised repair of the charger nor dismantle the device.

User safety and reliability of the device require that the charger not be used in humid and wet places.

Before you start using the charger, always check if its main components, including the cables, are not damaged.

Attention! If any damage is detected, disconnect the device from the mains immediately and replace the damaged part with a new one, by contacting an authorised service centre.

5. Getting started

5.1. How to charge the batteries

iScan 2 MULTI is powered by a Li-Ion 14.4 V 6.8 Ah battery.

Charging duration: 4 hours.

Operating time: up to 7 hours when fully charged.

In order to charge the battery:

1. Turn off the ultrasound scanner.
2. Disconnect the battery from the ultrasound scanner.
3. Connect the charger cable to the socket in the battery.
4. Connect the charger to the mains.
5. When the diode changes its colour from red, via orange, yellow into green — your battery is properly and fully charged.
6. Disconnect the battery from the charger.
7. Disconnect the charger from the mains.

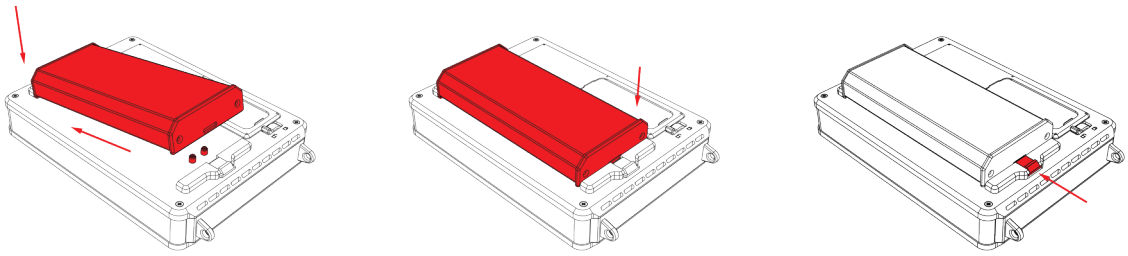
When the green diode of the charger starts flashing, it means that the battery is charged and the charger is in stand-by mode.

5.2. How to connect the batteries to the ultrasound scanner

The battery is to be connected on the rear wall of the ultrasound scanner.

Before connecting, make sure that the contacts of the ultrasound scanner and the battery are dry.

In order to connect the battery, follow the figure below:



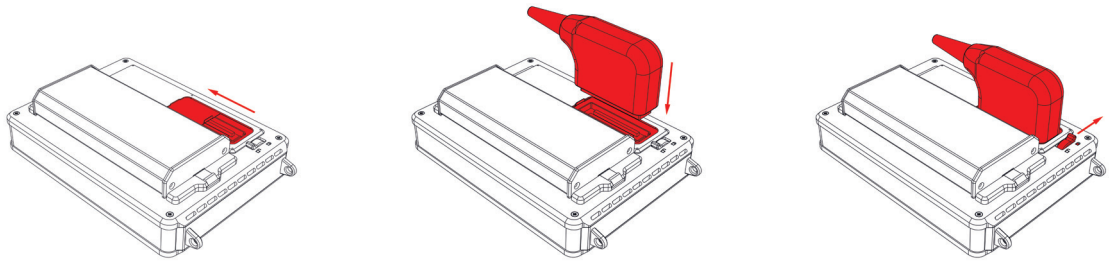
Connecting the battery

5.3. Connecting and disconnecting a probe

Attention! It is recommended to connect the probe when the ultrasound scanner is turned off.

1. Open the probe socket slide.
2. Connect the plug into the socket as indicated on the label.
3. Move the socket lock to the "locked" position.

In order to disconnect the probe, follow the above procedure in the reverse order.



Connecting the probe

5.4. Attaching the suspenders

Attach 3 snap hooks to the fair-leads of the ultrasound scanner — two at the top and one at the bottom. (Fig.) Place the suspenders around your neck and arm. Secure the fourth snap hook. Adjust the length of the suspenders.

Sequence of attaching the suspenders

Correctly secured suspenders (short straps at the bottom)

5.5. How to turn the ultrasound scanner on

In order to turn on the ultrasound scanner:

1. Attach the battery.
2. Connect the probe.
3. Press the On / Off button and wait for approx. 20 seconds.
4. When the image from the probe appears on the screen, the scanner is ready for work.

6. How to end operation of the ultrasound scanner

6.1. How to turn the ultrasound scanner off

In order to turn the ultrasound scanner off, press and hold the On / Off button for approx. 2 seconds.

Remember, pressing for a short time the ON/OF button will freeze the image.

6.2. Cleaning and disinfection

Remember to clean and disinfect the ultrasound scanner after finishing work with it.

Clean it with a wet cloth or paper towel.

Attention! Never wash the ultrasound scanner under running water!

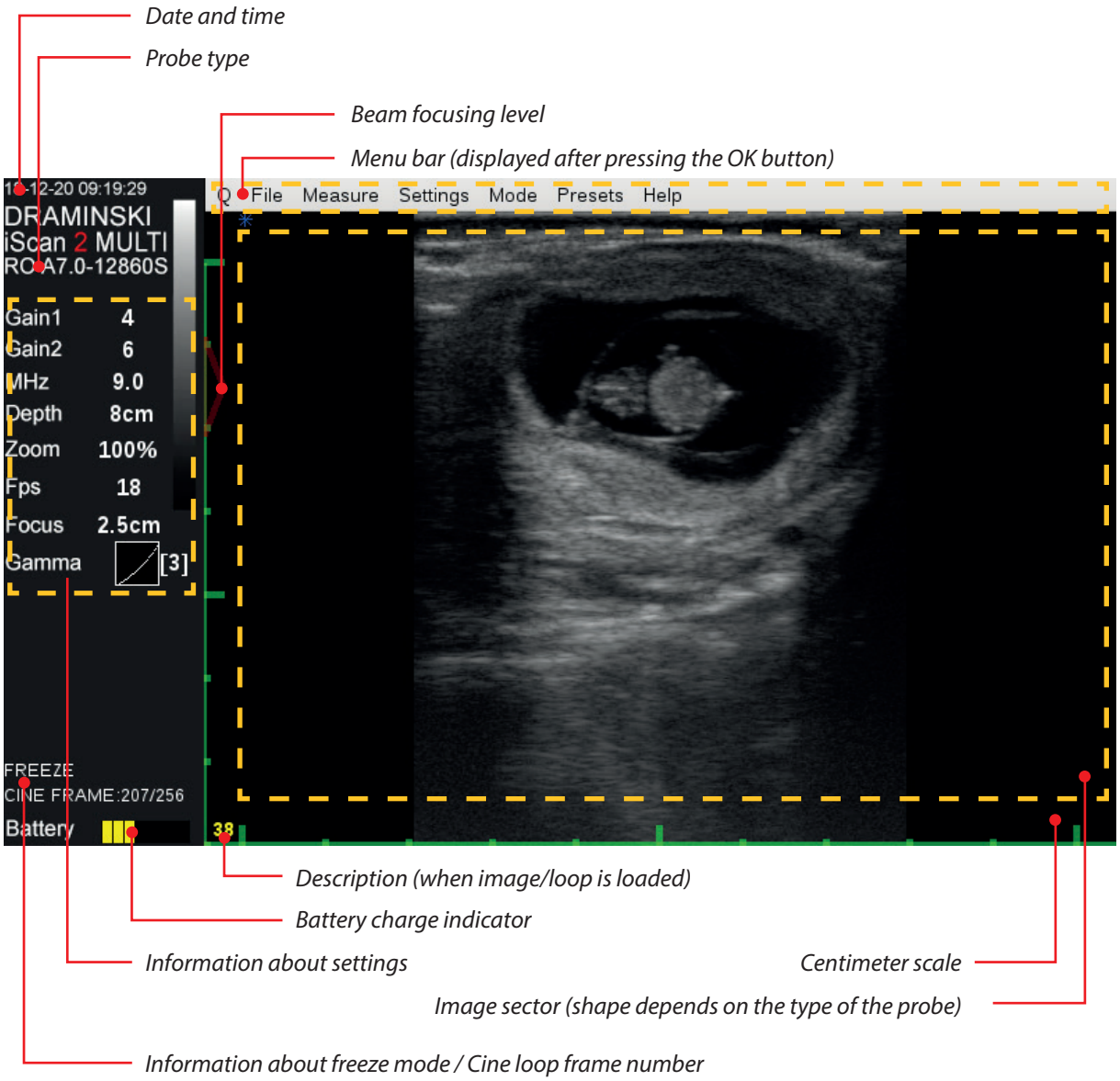
Attention! Ensure that the probe socket and battery contacts do not get wet! Prevent water from penetrating the ultrasound scanner through ventilation slots!

In order to clean the ultrasound scanner:

1. Turn off the device.
2. Disconnect the battery.
3. Disconnect the probe and close the socket slide.
4. Put the protecting plugs into the goggles and data transmission sockets.
5. Wipe the battery, the probe and the ultrasound scanner with a wet cloth or a paper towel.
6. Wipe all elements dry.

To disinfect the ultrasound scanner and its accessories, use the products intended for disinfection of medical devices which do not contain alcohol.

7. User control panel



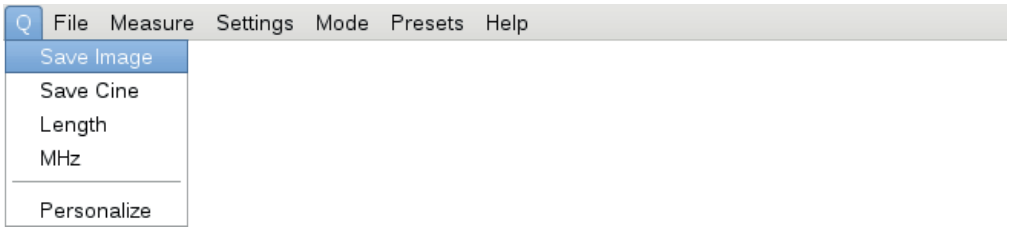
User control panel

8. Menu structure of the ultrasound scanner

In order to open the Menu, press OK.

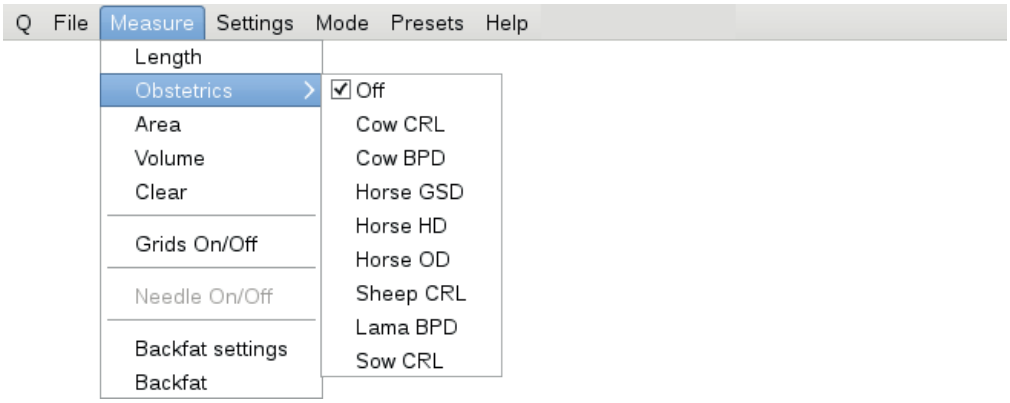
In order to leave the Menu, press ESC.

When you select certain functions, a tip is displayed on the screen which explains how to change their settings. The figures below present the entire Menu structure:

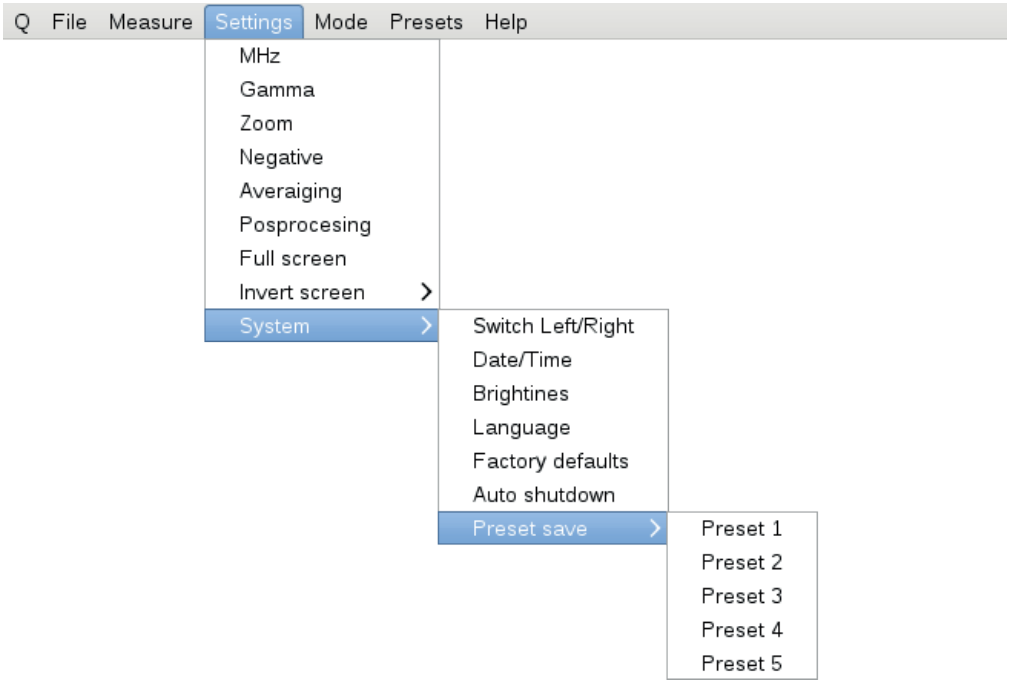


Personalised Quick Access Menu

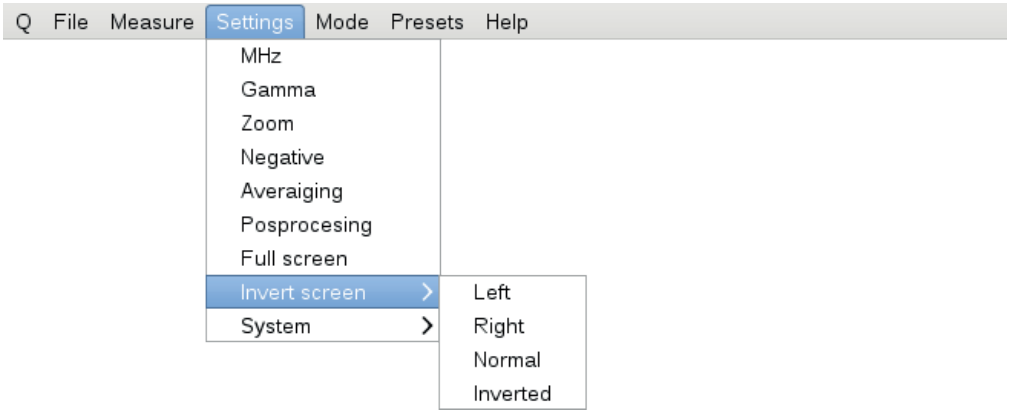
Menu for saving and loading images and loops



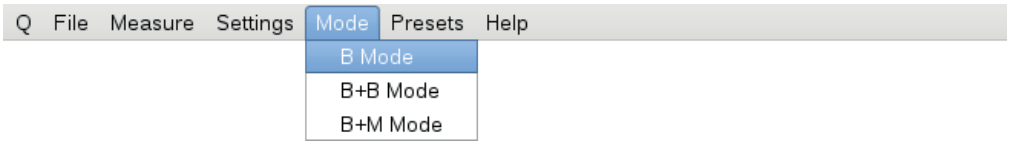
Measurement menu and age tables



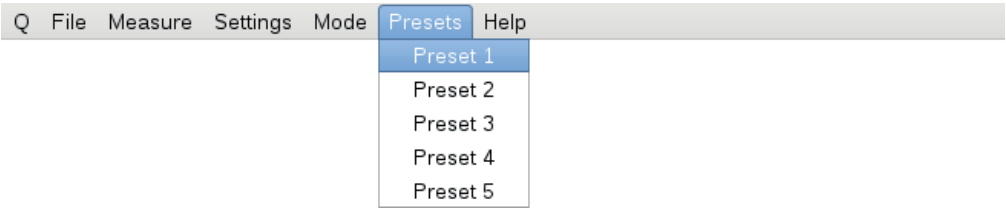
Advanced and system settings menu



Screen rotation menu



Imaging mode menu



Presets. Menu of personalized user-defined presets

Help menu

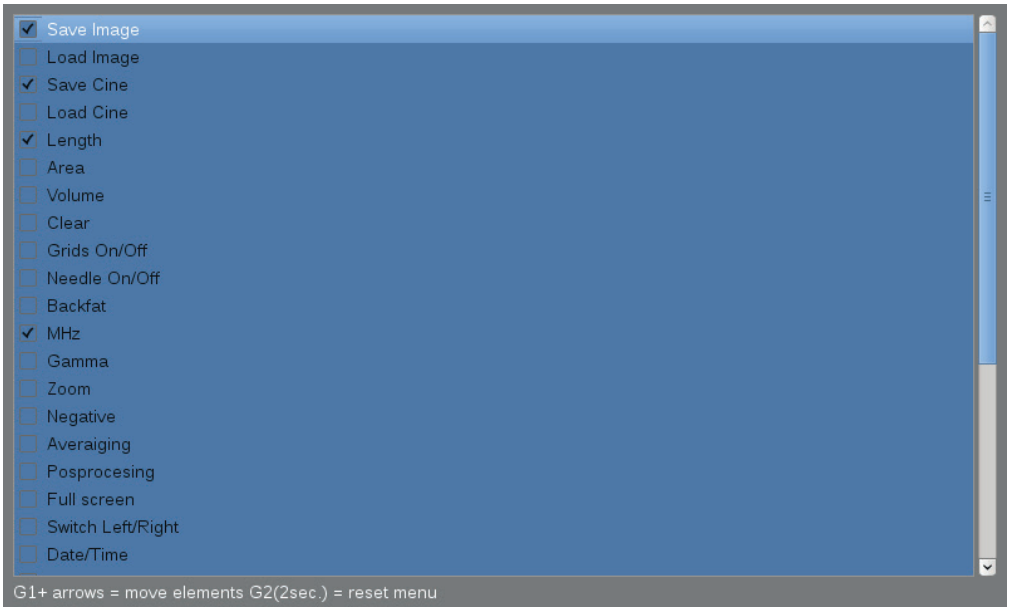
8.1. Personalization of the Quick Access Menu (Q)

The ultrasound scanner has a Quick Access Menu (Q) function which enables selection of functions among those available in the standard menu and gathering them in one tab, in the selected order.

It is marked with the letter „Q" (Quick) in the system.

In order to personalise the Quick Access Menu:

1. Ensure the ultrasound image is not frozen.
2. Open the Menu
3. In the „Q" tab, choose Personalize.
4. Using the UP / DOWN arrows, mark the element to be displayed in the Q Menu.
5. Select the element using RIGHT / LEFT arrows.
6. Repeat the procedure for the other elements.
7. You can move the selected element in the list by pressing G1 button and simultaneously pressing the UP / DOWN arrows.
8. In order to approve the Q Menu, press OK.



List of options to be shown in the Quick Access Menu

Attention!

To correctly save the Quick Access Menu settings, the ultrasound scanner should be in working mode – image unfrozen.

When the ultrasound scanner is turned off, it remembers the Q Menu settings.

In order to reset the settings, choose the Personalize option and hold the G2 button for approx. 2 seconds.

9. Description of the ultrasound scanner's functions

9.1. Setting the parameters of imaging

9.1.1. Gain adjustment

The signal gain can be adjusted completely or only in the far field. It makes the structures displayed on the screen lighter or darker.

In order to adjust the Overall Gain:

1. Press G1.
2. Use the UP / DOWN arrows in order to adjust gain.
3. Confirm with the OK button or wait until the tip disappears.

In order to adjust Gain in the far field:

1. Press G2.
2. Use the UP / DOWN arrows in order to adjust gain.
3. Confirm with the OK button or wait until the tip disappears.

9.1.2. Adjustment of scanning depth

In order to adjust the scanning depth, use the LEFT / RIGHT arrows, where LEFT means scanning of shallowly located organs, and RIGHT means scanning of deeply located organs.

The maximum scanning depth depends on the probe connected (see section 4.2. Probe).

9.1.3. Focusing

The ultrasound scanner can change the level on which the ultrasound beam is focused the most. In the area of the highest beam focus the signal is the strongest and the image resolution is the highest. In order to set the beam focusing on the selected area, use the UP / DOWN arrows, where UP makes the beam focus shallower, and DOWN — deeper.

9.1.4. Frequency

The probes available with the iScan 2 ultrasound scanner are broadband, multi frequency probes. It means that the user can decide on the frequency range their probe is to be operated. It is necessary to remember about the following principle:

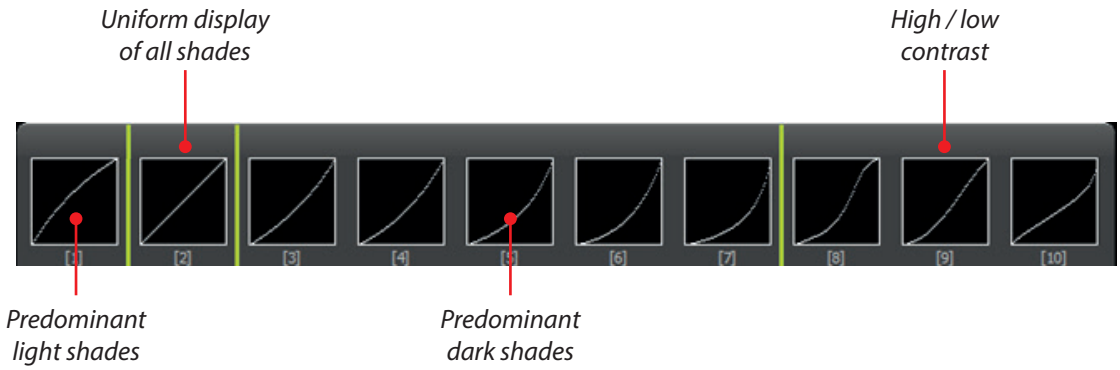
1. Higher frequency = better resolution = lower efficient depth of scanning.
2. Lower frequency = worse resolution = higher efficient depth of scanning.

In order to change the frequency:

1. Open the Menu
2. Go to Settings.
3. Select MHz.
4. Use the UP / DOWN buttons to choose the most efficient frequency.
5. Confirm with the OK button.

9.1.5. Gamma

Gamma adjustment changes the way the grayscale is displayed on the screen.



In order to change Gamma settings:

1. Open the Menu
2. Go to Settings.
3. Select Gamma.
4. Using the arrows, select a proper setting.
5. Confirm with the OK button.

9.1.6. Frame averaging

This function enables anti-aliasing by super-imposing every second neighbouring frame and displaying them simultaneously.

In order to change the frame averaging:

1. Press the OK button.
2. Go to Settings.
3. Select Frame averaging.
4. Using the arrows, select a proper setting.
5. Confirm with the OK button.

9.1.7. Zoom

Zooming can be adjusted at 20% increments, in the range:

- 60% — 100% (reducing the image),
- 100% — 200% (magnifying the image).

In order to change Zoom:

1. Press the OK button.
2. Go to Settings.
3. Select Zoom.
4. Using the arrows, select a proper setting.
5. Confirm with the OK button.

9.1.8. LuciD

LuciD is a tool which causes: smoother structure edges, enhancement of parenchymal structures, improvement of contrast.

In order to activate/deactivate the postprocessing:

1. Press the OK button.
2. Go to Settings.
3. Select LuciD.
4. Using the arrows, select a proper setting.
5. Confirm with the OK button.

9.1.9. Negative

This function enables viewing the image in negative.

In order to activate/deactivate the postprocessing:

1. Press the OK button.
2. Go to Settings.
3. Select Negative.
4. Using the arrows, select a proper setting.
5. Confirm with the OK button.

9.2. Presets

This option enables saving your favourite imaging parameters with a selected name.

You can save up to 5 presets in the system.

9.2.1. Creating presets

In order to create a preset:

1. Optimise the scanning parameters: G1, G2, frequency, depth of scanning, focus, zoom and gamma.
2. Open the Menu
3. Go to Settings.
4. Go to System
5. Go to Save Preset
6. Select an empty preset to save new one or an existing one to replace it
7. A dialog box opens: Do you want to save settings to preset? YES/NO
8. Confirm with the OK button.
9. Enter the name of the preset using navigation buttons.
10. Confirm with the OK button.

9.2.2. Loading presets

In order to load the settings saved in the preset:

1. Press the OK button.
2. Go to Presets.
3. Select an appropriate preset.
4. Confirm with the OK button.

9.3. Freeze

9.3.1. How to freeze the image

In order to freeze the image, press Freeze or ON/OFF.

At the bottom of the information box, a message FREEZE appears. Pressing one of the buttons again unfreezes the image.

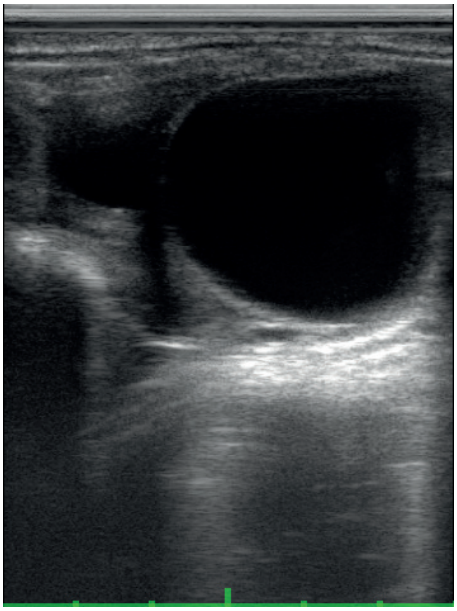
9.3.2. Follicle

Automatic follicle measurement allows you to quickly determine the largest dimension of a follicle.

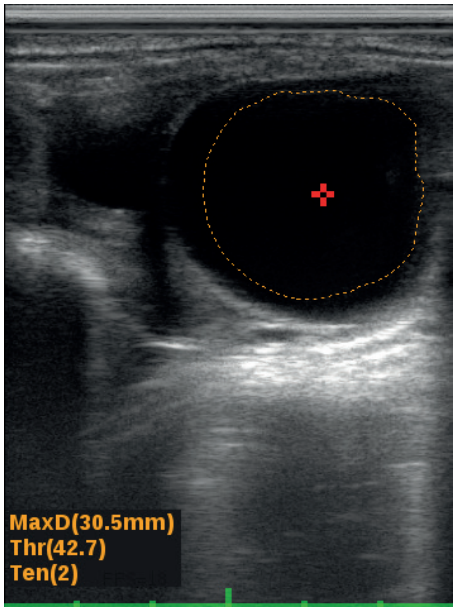
For a correct measurement as clear image of the follicle as possible has to be obtained.

In order to measure a follicle:

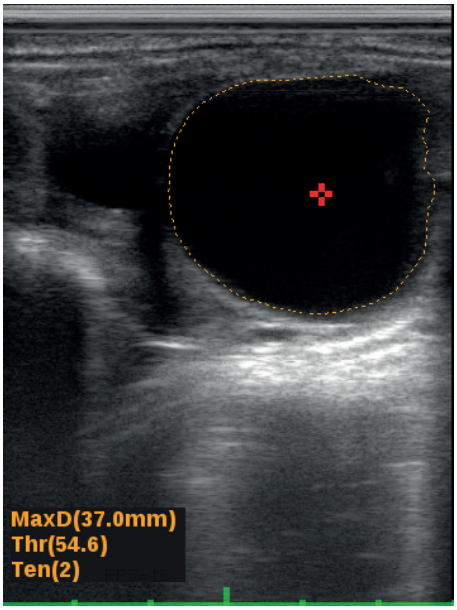
1. Freeze the image.
2. Open the Menu and move to the Measurement tab.
3. Select Follicle.
4. Place the measurement cursor in the center of the follicle.
5. Confirm the position of the cursor with OK. The system traces the boundaries of the follicle.
6. If the outline does not match the follicule boundary, use the up / down arrows to change the measurement sensitivity (Thr) or the left / right arrows to change the degree of roundness of the measurement (Ten).
7. The result is presented in mm.



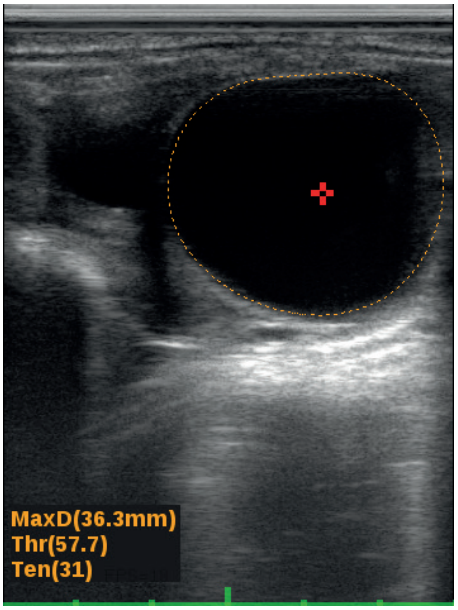
Follicle before measurement



Follicle measurement – sensitivity too low



Proper follicle measurement



Proper follicle measurement – rounding

9.4. Cine-loops

Once the image is frozen, you can go up to 256 frames back.

In order to view the cine loop continuously, press the up or down arrow.

In order to stop the cine loop in a selected moment, use the left or right arrow.

In order to view the cine loop frame by frame, press the left of right arrow

9.5. Measurements

The ultrasound scanner has tools to measure: distance, area, volume, backfat, embryo biometry.

9.5.1. Distance

In order to measure distance:

1. Freeze the image.
2. Press the OK button.
3. Go to Measure.
4. Select Distance.
5. A marker will be displayed on the screen. Set it in a selected area using the arrows.
6. Confirm the position of the marker by pressing OK.
7. Another marker will appear on the screen. Follow the steps 5 and 6.
8. The distance measured between the two markers will be shown at the bottom left corner of the screen.

The user can perform up to 4 measurements in one image.

In order to facilitate the reading, the results are presented in the same colour as the measured distance.

9.5.2. Surface area

Surface area is calculated on the basis of two sections according to the following formula: P=AxB.

The result is presented in cm^2.

In order to measure area of a structure:

1. Freeze the image.
2. Press the OK button.
3. Go to Measure.
4. Select Area.
5. Set two measuring sections as in section 9.5.1.

9.5.3. Volume

Volume is calculated on the basis of three sections according to the formula: P=AxBxC.

The result is presented in cm^3.

In order to measure volume of a structure:

1. Freeze the image.
2. Open the Menu
3. Go to Measure.
4. Select Volume.
5. Set three measuring sections as in section 9.5.1.

9.5.4. Backfat thickness measurement

In order to turn on the backfat thickness measurement:

1. Open the Menu.
2. Go to Measure.
3. Select Backfat Settings.
4. Set Backfat = YES.
5. Freeze the image.
6. Open the Menu.
7. Go to Measure.
8. Select Backfat.
9. A horizontal line will appear on the screen.
10. Use the UP/DOWN arrows and set the line on the border between the fat layer and the muscle.

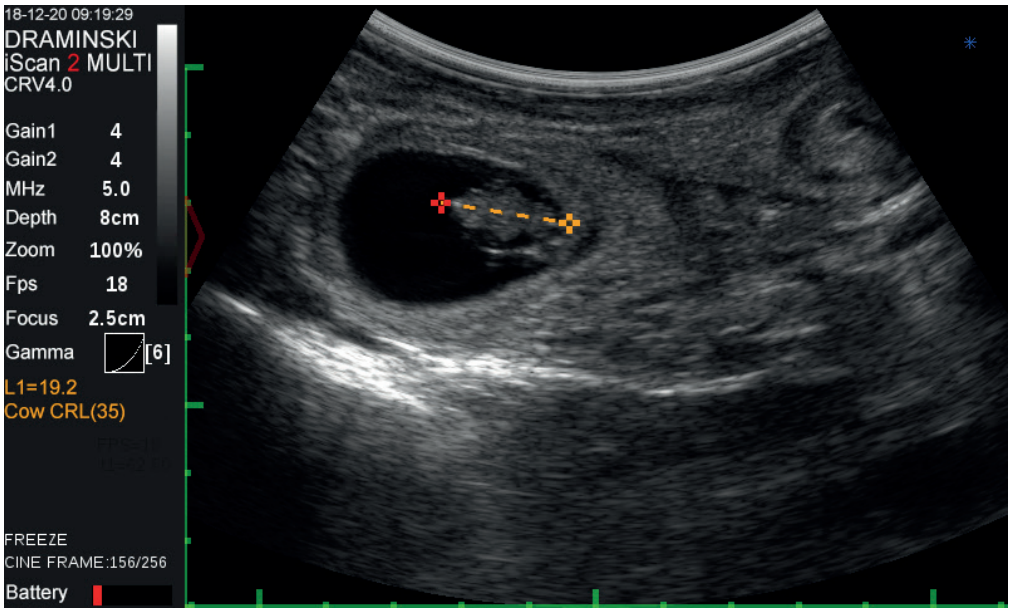
9.5.5. Embryo biometry

In order to turn on the biometry measurements:

1. Open the Menu.
2. Go to Measure.

3. Go to OB.
4. Select proper measurement.
5. Confirm with the OK button.

From now on, every time you perform distance measurements, the scanner will automatically calculate the day of pregnancy on the basis of the selected biometric measurement.



Biometric measurement „Cow CRL"

9.5.5.1. Cow CRL – embryo length

The result is presented in mm and days.

Measurement availability: from 30th to 80th day of pregnancy.

9.5.5.2. Cow BPD – head diameter measured between the fontanelles

The result is presented in mm and days.

Measurement availability: from 65th to 200th day of pregnancy.

9.5.5.3. Horse VD – germinal follicle size

The result is presented in mm and days.

Measurement availability: from 9th to 45th day of pregnancy.

9.5.5.4. Horse HD – head diameter

The result is presented in mm and days.

Measurement availability: from 90th to 200th day of pregnancy.

9.5.5.5. Horse OD – eye diameter

The result is presented in mm and days.

Measurement availability: from 90th to 330th day of pregnancy.

9.5.5.6. Sheep CRL – embryo length

The result is presented in mm and days. Measurement availability: from 30th to 70th day of pregnancy.

9.5.5.7. Lama BPD – head diameter measured between the fontanelles.

The result is presented in mm and days.

Measurement availability: from 75th to 240th day of pregnancy.

9.5.5.8. Sow CRL – embryo length

The result is presented in mm and days.

Measurement availability: from 20th to 50th day of pregnancy.

9.5.6. Grid

This tool projects the grid graduated 1 cm or a scope.

In order to turn on the grid:

1. Open the Menu
2. Go to Measure.
3. Select Grid ON/OFF.
4. Using the arrows, select a proper setting.
5. Confirm with the OK button.

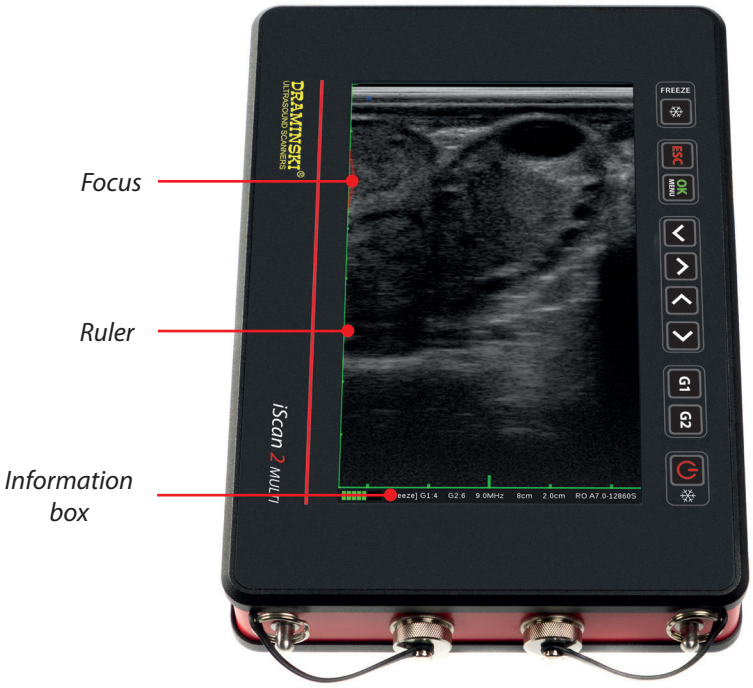
9.6. Full screen

This option enables displaying the image in a full-screen mode without the information box. In order to turn on Full screen:

1. Open the Menu
2. Go to Settings.
3. Select Full screen
4. Using the arrows, select a proper setting.
5. Confirm with the OK button.

9.7. Rotating images

This option enables rotation of the image by 90° and 180°. This enables enlarging the image at a different proportion onto the entire screen. In order to use this function more comfortably, attach the suspenders so that the orientation of ultrasound scanner matches the orientation of the image.



The image rotated by 90°.

In order to rotate the image:

1. Press the OK button.
2. Go to Settings.
3. Go to Rotate image.
4. Select proper direction and angle of rotation.
5. Confirm with the OK button.

When the image is rotated, all the data are shown at the bottom part of the screen.

Attention! The navigation buttons show the direction in accordance with the image orientation!

9.8. How to save data

The ultrasound scanner has internal memory able to save 200 cine loops and 200 images.

9.8.1. Saving images

In order to save the image:

1. Freeze the image.
2. Press the OK button.
3. Go to File.

4. Select Save image.
5. A message will be displayed on the screen: "Do you want to add description? Yes / No."
6. If you decide to add a description, enter the characters using the Up / Down arrows and the Left / Right arrows. The description may contain maximum 30 characters.
7. Confirm with the OK button.

Attention! The image can be saved with the marked measurements. The measurements are described in the section: 9.7.

9.8.2. Saving cine loops

The cine loop is a video of the examination comprising maximum of 256 frames. In order to save the cine loop, follow the steps described above, selecting Save Cine loop in the File Menu.

9.9. How to load the data onto the screen

9.9.1. Uploading images

In order to load the image:

1. Press the OK button.
2. Go to File.
3. Select Load Image.
4. Select a file from the list in order to display it. Each file has a thumbnail of the image.
5. Confirm with the OK button.

9.9.2. Uploading cine-loops

In order to load the cine loop, follow the steps described above, selecting Load Cine loop in File Menu.

Once the cine loop is loaded, start the video playback on the screen using the up/down arrows.

The left/right arrows enable to view the sequence frame by frame.

9.9.3. Browsing images and cine loops

Images and cine loops saved in the memory can be searched by their description provided that the description was added.

In order to filter data according to description:

1. Open the Menu.
2. Go to File.
3. Open the list of files using Load Image / Load Cine loop.
4. Press G1 in order to open the Menu.
5. Select Search.
6. Enter the first letters of description using navigation arrows.
7. The list will display the files with names matching the filter.
8. In order to restore the list of all files, start Search, clear the description and confirm with OK.

9.10. How to export data to the external data storage device

The ultrasound scanner enables exporting data to external data storage USB device.

The images are exported in .BMP format, and cine loops are exported in .AVI format. The files are saved directly on the external data storage device.

In order to export data:

1. Connect data transmission cable to socket #2.
2. Connect a flashdrive.
3. Open the Menu.
4. Go to File.
5. Select Load image or Load cine loop.
6. Tick the desired files in the list using the Left / Right arrows.
7. Press G1 in order to open the Menu.
8. Select Send to USB.
9. A dialog box will appear showing the progress of the operation.
10. When the transmission is completed, the dialog box disappears.

9.11. How to delete data from the internal memory

In order to delete data from the internal memory:

1. Open the Menu.
2. Go to File.
3. Select Load image or Load cine loop.
4. Tick the desired files in the list using the Left / Right arrows.
5. Press G1 in order to open the Menu.
6. Select Delete.
7. The screen will show a dialog box with the question: Delete? Are you sure? YES / NO.
8. Once confirmed, the data will be deleted from the memory.

10. Imaging modes

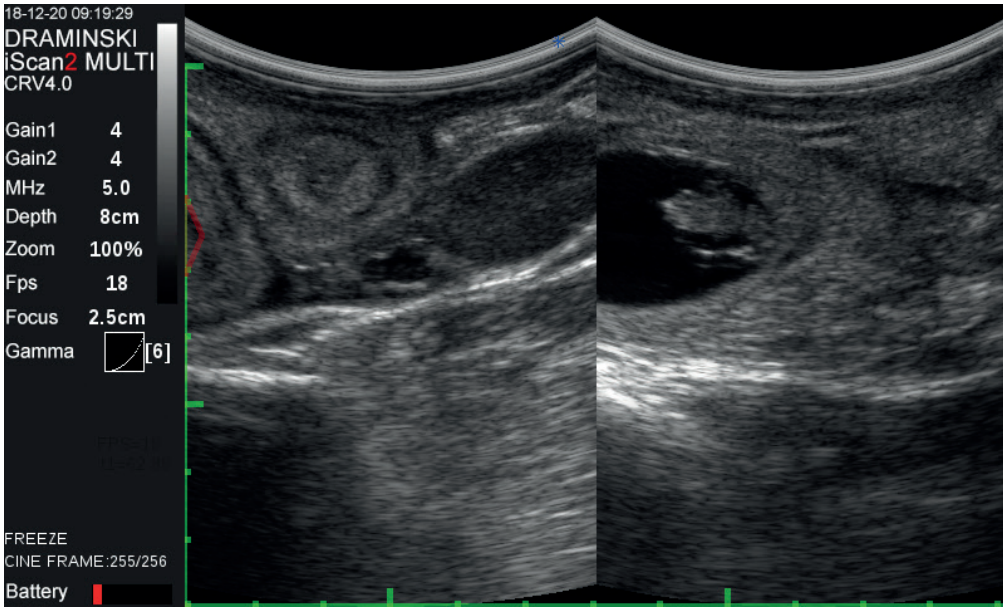
The ultrasound scanner operates in B, B+B and B+M modes.

10.1. B Mode

B Mode (Brightness) is used for two-dimensional imaging of a tissue section in grayscale. Dark parts correspond to anechoic structure, i.e. ones that do not generate echo, e.g. fluid. White parts, i.e. hyperechoic, correspond to structures generating very strong echo, e.g. bone. Other structures, depending on their composition, generate various levels of echo and are presented as parts in various shades of gray.

10.2. B+B Mode

This mode is used to compare even structures (e.g. ovaries), volume measurements, or showing the structures in different cross-sections.



B+B Mode

In order to compare structures in B+B mode

1. Freeze the image with the desired structure in the middle.
2. Open the Menu.
3. Go to Mode.
4. Select B+B.
5. The image will be moved to the right box.
6. Unfreeze the image — the left box will be activated.
7. Continue examination.

Attention! Measuring structures in both boxes is similar to B mode. There is no need to switch the boxes. The measuring point can be marked anywhere on the screen.

10.3. B+M Mode

It is used to show changes of structure shape over time. In order to turn on B+M mode:

1. Open the Menu.
2. Go to Mode.
3. Select B+M.

11. System settings

11.1. Change left / right

This option enables setting the image so that the marker on the screen corresponds to the side of the marker on the probe. It is meaningful for right- and left-handed people during rectal examination.

11.2. Date/Time

This option enables updating date and time in accordance with the calendar used by the user.

When this option is selected, a dialog box appears in which you can set date and time successively. Subsequent field is activated after confirming the previous one.

11.3. Brightness

This option is used to adjust brightness of the display screen. You should remember that the level of brightness influences the time of battery operation. The range of adjustment is within 10% to 100%.

11.4. Language

After the language has been selected and the OK button has been pressed, the system automatically changes to the selected language version.

11.5. Factory settings

This option enables restoring default settings for certain parameters of the image if they were changed by the user and there is a need to restore standard settings. Selecting this option causes resetting the scanner and restoring all of the saved settings. Images and cine loops which were saved are not deleted.

11.6. Automatic shutdown

This option enables setting the time that needs to elapse for the system to automatically turn off unless the user presses any button in the meantime. Available settings: never, 5 min, 15 min, 30 min, 60 min.

In 60 seconds before the automatic shutdown, the screen will display the following message: "Auto power OFF, 60 seconds" — the system will count down 60 seconds until shutdown. The message disappears if any of the buttons is pressed, and the system will count down the set time again.

12. Accessories

12.1. Goggles

Dramiński Goggles will guarantee a clear image with great contrast in sunny days.

With 5-step adjustment, every user can set the displays according to their preferences, while observing the safety rules.

OLED Goggles

In order to connect the goggles:

1. Remove the plug protecting the goggles socket.
2. Connect the plug of the goggles cable to the socket and tighten the protection. The image will be simultaneously displayed both on the goggles and on the screen.
3. In order to switch the display to "goggles only", press and hold ESC. The display will turn off, and the system will automatically switch to full screen mode.

Attention! If the scanner is turned off when working in the "goggles only" mode, when powered on, the display of the scanner will be turned off. In order to restore display screen, press and hold ESC.

In order to change the image display parameters when using the goggles, use the buttons on the converter.

When you enter the converter menu, the following options will be displayed:

Function	Description	Default value
HSIZE	Height of the image	91*
VSIZE	Width of the image	87*
BRIGHTNESS	Brightness	50
CONTRAST	Contrast	60

SATURATION	Colour saturation	50
SHARPNESS	Sharpness	10
PAL / NTSC	Video signal format	PAL BDGHI
OSD BACKGROUND	Converter settings menu background	BLACK
LCD	Font	LCD
NORMAL	Zoom	Normal

* Changing the parameter may disturb image proportions.

Attention! Remember to disconnect the goggles and put the protecting plug before cleaning the ultrasound scanner!

Attention! Protect the goggles against water! It is permitted to clean the goggles with a slightly wet cloth.

12.2. Screen sun shield

The Screen sun shield helps reduce the sunlight reflection from the display screen.

Screen sun shield

In order to attach the Screen sun shield:

1. Prepare the scanner for operation.
2. Attention! It is recommended to attach the Screen sun shield before connecting the probe.
3. Put the Screen sun shield to the screen so that it does not cover the keyboard, the rubbed band should hang loosely from the bottom part of the scanner.
4. Put the loose part of the band around the ultrasound scanner, over the battery and secure it at the upper edge of the Screen sun shield.

12.3. Linear rectal probe extension for cattle.

The extension is used for a quick endorectal test for pregnancy without the need for the examiner to insert their arm into the rectum of the animal. Compatible with the SH RL4-9/60 probe.

Long linear rectal probe extension

In order to secure the rectal probe to the extension, place the probe at the top of the extension and route the cable in the groove.

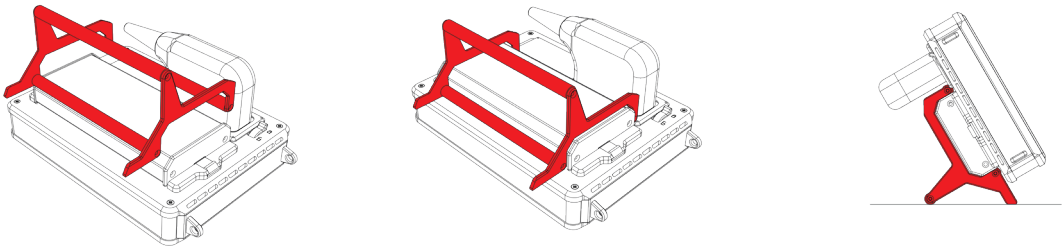
12.4 Linear rectal probe extension for sheep.

The extension is used for rectal examination of sheep using the SH RL4-9/60 probe. It enables precise transrectal imaging of uterus, ovaries and embryo.

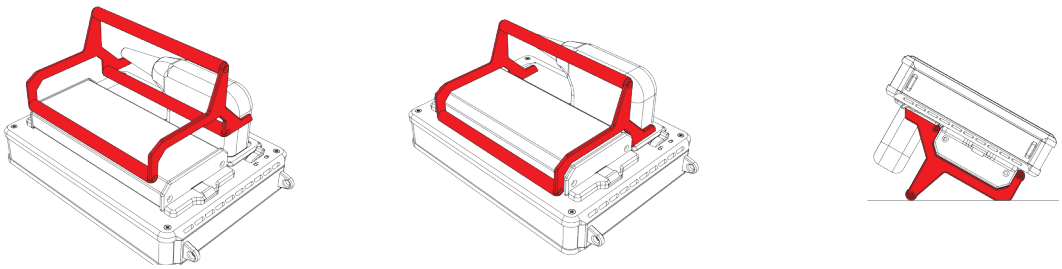
Short linear rectal probe extension

12.5 Battery support.

The battery support makes it possible to fix the ultrasound scanner, e.g. on a table. It is secured to the battery. The assembly defines the angle between the ultrasound scanner and the ground.



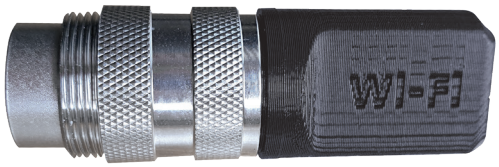
Assembling the battery support onto the battery (60° angle)



Assembling the battery support onto the battery (30° angle)

12.4. WiFi antenna

The WiFi antenna allows you to send images and cine to your phone and to use our phone to take measurements. Installation of the Draminski Ultrasound Scanner app on your phone is required.



WiFi antenna

12.4.1. Connecting the phone to the ultrasound scanner:

1. Connect the antenna to the socket. The message "WiFi module connected" will appear on the screen.
2. Open the Menu and go to the Settings tab
3. Select WiFi.
4. Select WiFi access point.
5. A wireless connection icon will appear on the screen. The ultrasound scanner will create a network called DraminskiIscan and start transmitting a WiFi signal.
6. On your phone, go to the WiFi settings and select the DraminskiIscan network.
7. Start the Ultrasound Scanner app.

12.4.2. Turning off WiFi

If the WiFi access point is not disabled, each time the ultrasound scanner is restarted, the system will check that the WiFi antenna is connected and if it detects the connection, it will automatically start transmitting the signal.

In order to turn off WiFi:

1. Open the Menu and move to the Settings tab.
2. Select WiFi.
3. Select “Turn off WiFi”. The connection icon will disappear.

13. Maintenance of the device and the probes

13.1. Cleaning and disinfection

Attention! In view of the biological security, it is recommended to clean and disinfect the ultrasound scanner after you finish working with it.

During use, the device may become strongly contaminated, including contagious material. Immediately after finishing work, the scanner should be cleaned with a wet soft cloth or a paper towel with mild detergent.

The device surface should be disinfected with appropriate substance intended for disinfection of medical and veterinary product surfaces.

Attention! The ultrasound probe should be carefully disinfected after every use.

After wet-cleaning, the probe and the ultrasound scanner should be wiped dry with a soft paper towel, if necessary.

Warning! It is forbidden to use highly concentrated, aggressive and abrasive agents. Such agents can permanently damage the surface of the probe, the display screen and the casing.

During wet-cleaning, protect the probe connector, casing sockets and ventilation slots against humidity.

Warning! Use alcohol-free agents to disinfect the probe.

In order to wash the ultrasound scanner after work has been finished:

1. Tighten the protective plugs for goggles and data transmission sockets.
2. Disconnect the battery.
3. Disconnect the probe and close the socket slide.
4. Disconnect the suspenders.
5. Wipe the ultrasound scanner with a damp (water or mild detergent) cloth or paper towel. Do not use running water!
6. Wipe the ultrasound scanner dry.
7. For disinfection, use a proper agent intended for disinfection of surfaces of medical and veterinary devices. Follow the instructions on the label.
8. Clean and disinfect the battery and the probe using damp paper towels or tissues.
9. Let the ultrasound scanner, probe and battery dry in a safe place.

Attention! The transport case has a vent valve to control the air pressure in the closed case. It is not mois-ture-permeable. Do not close a wet device in the case. If humidity accumulates in the case, we recommend using car desiccants available in stores and petrol stations.

The carrying case should be cleaned externally with water and detergent. The foam insert should be vacuumed regularly and cleaned with water and a mild detergent. A disinfectant solution, e.g. Virkon S, may be used for disinfection. Before using the carrying case, make sure that the foam insert is completely dry.

13.2. Technical inspections

Remember to always check the ultrasound scanner, the battery, the probe and its cable for mechanical damage before starting to work. If you notice anything disturbing (for example, discontinuity of the cable), contact the service centre immediately.

The users of the ultrasound scanner are recommended to have regular technical inspections performed by the manufacturer every two years. It will guarantee the highest safety and durability.

14. Transportation of the device

It is recommended to transport the device in the provided transport case. The arrangement of the elements in the case is shown in the following figure:

Transport case with additional battery

15. Operational and technical notes

It is necessary to shave fur and use ultrasound gel in order to carry out abdominal examination. Proper layer of the gel will definitely improve penetration of the ultrasound beam and will enable obtaining proper and legible images.

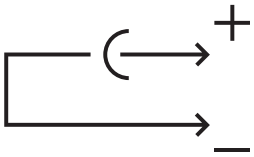
During and after the examination, protect the head of the probe and the cable against mechanical damage. Remember:

1. To arrange the cable of the probe properly. Improper placing or excessive bending of the cable can cause damage to the wire.
2. To put the probe in the case properly. To avoid squeezing the cable with the cover of the case, as it may cut the wire.
3. To store the probe properly and safely.
4. The ultrasound scanner, probes and batteries should be stored in a dry place.

Attention! If the storage temperature happens to fall below 5°C, it is necessary to warm the probe up before turning on the device. Using the ultrasound scanner in extreme temperatures alternatively is unfavourable and can lead to damages.

15.1. Troubleshooting

Symptoms of improper operation of the device	Causes / Verification
The device does not turn on	1. Check if the battery is properly attached. 2. Check if the battery is charged. 3. Check if the device operates with another battery for iScan 2, if available. 4. Check if the ultrasound scanner is not running in the Goggles display mode. After pressing the ON/OFF button, press and hold ESC button for approx. 2 s.
The system does not recognise the connected probe	1. Check if the probe connector is correctly connected to the socket. 2. Check if the probe lock lever is in fully "locked" position. 3. Check pins of the probe connector and of the socket. If dirty, clean them with compressed air or soft copper brush. When cleaning the pins with the brush, move it only in parallel to the pin direction, from its base to the tip.
The image is disturbed	1. Check if the ultrasound scanner is not located near other devices emitting electromagnetic field. 2. Check if the probe cable has no mechanical damage.
The image is too bright or too dark	1. Check the settings of brightness, gain, gamma and MHz. 2. Restore the factory settings.
No charging indication on the battery charger	1. Check if the charger is properly connected to the mains. 2. Check the power supply in the mains.

After connecting the discharged battery to the battery charger, the LED of the charger is green but the battery is not charging	1. Check if the connector on the battery side is not reversely connected to the charger cable. Orientation of the symbols on the connector and on the cable should correspond with the figure below.  2. Check if the charger plug is correctly connected to the battery socket.
The battery works too short	1. The battery was not charged. 2. Low ambient temperature. 3. The battery is worn out.

If none of the actions presented in the table is successful, please, contact the service centre of the DRAMINSKI, phone No: **+48 89 675 26 00** or e-mail: **sales@draminski.com**.

16. iScan 2 MULTI technical specification

Dimensions	256 x 165 x 69 mm (LxWxH)
Weight of the device	2060 g including the battery; 2640 g including the probe and the battery
Weight of the battery	540 g
Purpose	Ultrasound diagnostics of animals: Diagnostics of reproductive system Confirmation and monitoring of pregnancy Measurement of backfat thickness Ultrasound examination of lungs, digestive system, urinary tract, locomotor system and eyeball.
Image display modes	Screen Goggles Image rotated by 90° left or right Image rotated by 180°
Image refreshing	Up to 28 FPS
Grayscale	256 shades
Gamma	10 settings
Display screen	7.0" diagonal IPS LCD LED 800 x 480 px
Probe	Electronic, broadband.
Probe connection	Interchangable
Keyboard	Membrane, water resistant
Image projection	B Mode B+B Mode B+M Mode
Image management	Freezing the image Dimensioning Zoom 60-200% at 20% increments Saving to internal memory Exporting to external storage device
Measurements	Distance, area (of 2 measurements), volume, grid, age tables (Cow CRL, Cow BPD, Horse DSG, Horse DO, Sheep CRL, Lama BPD), Backfat + muscle
Saving data to the memory	Image with measurements Cine loop (256 frames = approx. 14 seconds)
Image memory	200
Cine loop memory	200
Quick access menu	Yes, customised
Presets	Reproductive tract, Pregnancy, Sex of foetus, Late pregnancy. New ones can be created by the user.
Power supply	Li-Ion, 14.4 V, 6.8 Ah
Continuous operation when the battery is fully charged	Up to 7 hours
Charging of the battery pack	4 hours
Battery charge indicator	Automatic — graphic indicator
Protection class	IP32 (protection against item larger than 2.5 mm, protection against water dripping at the maximum of 15°).
Operating temperature	From 0°C to +40°C
Recommended storage temperature	From 0°C to +40°C

17. Software information

The software information is available in the Help -> About ...

Here, you can find:

- the software version
- the date and time of creation and release of the software
- IP address (if WiFi is active)
- MAC address
- amount of free memory in the system
- amount of free memory on the SD card
- CPU temperature and system shutdown limit temperature
- operating system version
- WiFi network status

Software information

18. Demo

The demo function turns on a specially prepared presentation of several sample cine loops that demonstrate the diagnostic possibilities offered by iScan2 MULTI.

To turn it on:

1. Open the Menu and select Help.
2. Select Demo. Playback of the cine loops will start automatically.

To switch off, press Freeze.

19. Warranty

The manufacturer covers the ultrasound scanner with a 24-month warranty for failure-free operation when operated in accordance with the provided user guide.

The battery is covered with a 6-month warranty.

The ultrasound probes are covered with a 12-month warranty.

In case of a technical defect, which was not caused by the user, the manufacturer is obliged to repair the delivered device within no more than 14 business days from the date of delivery of the device to the service centre (Wiktora Steffena 21, 11-036 Sząbruk, Poland) and send back the operational device to the user at the manufacturer's cost. The warranty does not cover mechanical damage, damage caused by improper use, storage and self-made repairs.

The warranty is honoured on the basis of a proof of purchase (invoice). In order to claim under this warranty, notify Dramiński about the alleged defect within a reasonable period of time since the defect has been noticed, however, no later than the expiry date of the warranty.

To submit a warranty claim, the following steps must be taken:

1. Notify DRAMIŃSKI S.A. of the device malfunction immediately after it occurs.
2. Send the device to the Service Department (no later than before the warranty expiration date) or deliver it in person together with the proof of purchase, which should include the seller's and purchaser's details, the date and place of purchase, the device name, and its serial number.
3. A description of the malfunction must be enclosed with the device sent to the Service Department to ensure efficient diagnosis and repair of the damage:

- Before shipping, the ultrasound device, carrying case, and all included accessories must be cleaned and disinfected (*in accordance with the Cleaning and Disinfection section),
- Please pay particular attention when packaging the device to ensure that it is properly secured, as the manufacturer shall not be held liable for any damage incurred during transport.

The warranty is provided by DRAMIŃSKI S.A.
Wiktora Steffena 21, 11-036 Sząbruk, Poland
Phone No. + 48 89 675 26 00
e-mail: sales@draminski.com
www.draminski.com

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