



Version: 01.12.2024

TAGARNO

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1 Assembling your microscope

Assembling and installing the T5O requires no extra tools and everything you need is included with your delivery.

1.1 Assembly

- Open hatch and tilt arm forward to place it in the base.
- Tilt arm upright beflore closing the hatch.

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1.2 Connecting

Connect the cables as shown here.



when it lights up.

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1.4 Activation

When powering on the microscope for the first time, you need to adjust or confirm your local timezone.

Confirm or adjust settings

Use the center button on the Controller to adjust or confirm your timezone, date and time. Rotate it to adjust the values and press it to confirm your settings.

Go to Expert Room

On a separate computer, sign in or create an Expert Room profile by visiting www.tagarno.com/activate

Enter activation code

Go to the "Microscope" menu option, click the "Activate microscope" button and enter the activation code displayed on your microscope.



Congratulations on your new microscope

To activate your microscope, make sure your time zone and date/time are correct

Time zone





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Activate via browser

TAGARNO

www.tagarno.com/activate

On another device, enter the code below and follow the instructions to get started.

Activation code

XXXXXX

The code is only valid for the next 24 hours

Final Step

After completing the activation on Expert Room, insert the USB drive into the microscope and you're ready to go!



Complete activation

Download and install the firmware by following the 3-step process shown in Expert Room.

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1.5 Changing lenses

When removing a lens from the microscope, make sure to pull downwards on the tongue of the lens ring instead of gripping the lens itself.

To mount a lens, simply hold the lens ring close to the camera and the magnets will make sure that the lens is mounted correctly.

Mounting order

Mount the lens first before stacking the Magnetic ring light on top.

This also means that you need to remove the Magnetic ring light before changing lenses.



Tongue of lens ring Pull downwards to change lenses

1.6 Using the Magnetic ring light

If additional light is needed, mount the Magnetic ring light on top of the lens and make sure to adjust the integrated carrier height by hand, so the ring light aligns with the bottom of the mounted lens. This prevents shadows and ensures the best lighting conditions.



the O Bottom of lens and ring light are aligned 5

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2 Control options

In this section, you'll learn the different control options for your microscope.

2.1 Controller

The centerpiece of the included Controller is a tactile wheel button, that makes menu navigation seamless and intuitive.



2.1.1 Connect to microscope

Connect the Controller to the microscope with its USB 2.0 cable via one of the four ports.



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2.1.2 How to use the Controller



- Rotate button to navigate through the menu when open.
- Rotate button to zoom in and out (when the menu is closed).

Quick access to user configurated menu with short cut to favourite apps, functions and presets.

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2.2 Keyboard

You can also control the microscope using any USB connected keyboard. The keyboard can either replace or be used alongside the Controller.

Image: Control of the second secon

2.2.1 How to use the keyboard

Different shortcuts can be used at different times depending on whether the menu is open or closed, the active focus mode and if certain settings have been selected beforehand.

Please also note that the \uparrow / \downarrow keys and + / - keys have the same function. To keep the overview below as simple as possible, it only shows the \uparrow / \downarrow shortcuts.

Function	Shortcut	Available when
Image capture without graphics	Ctrl & S	Always
Image capture with graphics	Ctrl & Shift & S	Always
Adjust microscope height	Alt + \uparrow / \downarrow	Always
Perform a White Balance Calibration (WBC)	Ctrl + W	When in Manual WB mode
Activate presets 1–10	Key O–9 (O activates Preset 10)	If you've saved any presets
Change Focus mode	Ctrl + F	Always
Change between Dark and Light theme	Ctrl + T	Always
Zoom in/out – option 1	Ctrl + ↑ / ↓	When in Autofocus mode
Zoom in/out – option 2	Ctrl + Alt + ↑ / ↓	When in Manual focus mode

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Function	Shortcut	Available when
Adjust focus	Ctrl + ↑ / ↓	When in Manual focus mode
Open menu	\rightarrow / Space / Enter	When menu is closed
Navigate menu	$\leftarrow / \uparrow / \downarrow / \rightarrow$	When menu is open
Confirm / Select	Space / Enter	When menu is open
Adjust value – option 1	\wedge / \downarrow	When value change menu is active on vertical menus
Adjust value – option 2	\leftarrow / \rightarrow	When value change menu is active on horizontal menus
Close menu	Escape	Always
Abort value change in non-real-time changes	Escape	When value change menu is active
Activate/deactivate Ruler	Ctrl + R	Always
Go back	Backspace / ←	When menu is open, except when text input is selected

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2.3 Mouse

You can also control selected features on the microscope using a USB connected mouse.

2.3.1 How to use the mouse

Control zoom / manual focus

- Scroll wheel to zoom in/out (when menu is closed).
- Control manual focus (when in Manual focus mode).

Change focus mode

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Click wheel to change between Autofocus and Manual focus mode (when menu is closed).

Confirm/Select

Left click to confirm or select (when menu is open).

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2.4 Foot switch 4

When used with the TAGARNO microscope, Foot Switch 4 enables hands-free control over magnification, manual focus, and photo capture.

2.4.1 Connect to microscope

Connect the Foot switch to the microscope with its USB 2.0 cable in any of the four ports.

2.4.2 How to use the Foot switch



Take picture without graphics Bottom button.

Insert foot switch cable in one of the four ports.

Zoom out or move focus down

- Right button to zoom out (when in Autofocus mode).
- Control manual focus to focus on objects further away from to the lens (when in Manual focus mode).

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2.5 Open API

Below, you can see a few examples of how to use TAGARNO'S Open API to integrate your microscope with other systems or applications. This is a cost effective way to create a customized solution without the involvement of TAGARNO.

Examples of how to use the Open API

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Use microscope live image on AI platform

Use your own AI platform to change the settings on the microscope via the Open API.

Collaborate with in-line robots

the Open API.

If you've mounted a microscope on an in-line robot, you can use the TAGARNO API to control the settings of the microscope, e.g. with presets, to capture high quality images.

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Here's how to use the information shown in the graphical user interface on top of the microscope live image. Please note that the interface will differ depending on the software version on your microscope.

3.1 Graphical user interface

1. Closed menu icon

3. Notification

Notification box displays important operational messages categorized into three levels: Info, Warning and Error.

4. Microscope settings

See the current microscope settings, always visible on top of live image.

- Lens mounted on the microscope
- Magnification level
- Exposure mode (Auto, aperture, shutter, manual)
- Focus mode (Autofocus or manual focus)



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3.2 Menu features

A variety of features will become available, when you open the menu. Let's look at them in more detail.

3.2.1 Light

Control the integrated light and Magnetic ring light (when mounted on the microscope).



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3.2.2 Applications

Work smarter and achieve more accurate results by utilizing the included Ruler app.

Ruler app

See in metrics the true size of something placed in the center of the field of view.



How to activate/

deactivate Use the toggle button to activate/deactivate the on-screen ruler that is displayed on top of your microscope live image

Manual focus

When activated, the microscope will automatically change to Manual focus mode to focus on the part of the object furthest away. If needed, you can manually adust the focus using your control option of choice.

Always visible in Green

While activated, the Ruler will be visible even if you close the menu.

As default, the ruler is displayed in green.

Magnification level

As you're changing magnification levels, the units shown on the rulers will change accordingly.

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3.2.3 Favourite shortcuts

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Access your presets quickly in the Favorites menu.

Quick access to selected features

In the Favorites menu, you have access to your saved presets, allowing you to

easily load them when needed.

and presets

3.2.4 Settings

Access and adjust the microscope's general settings, presets as well as network and camera settings.



Find more info on each Settings submenu on the next page.

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3.2.4.1 Settings - General

A wide range of settings will become available when selecting General under Settings.



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3.2.4.2 Settings - Presets

With presets, you can save your Camera settings as a preset. This eliminates manual adjustment of the microscope settings and ensures consistency across inspections.

3.2.4.3 Settings - Network

When selecting Network under Settings, you can see your IP and MAC address and control your access to the microscope API.





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3.2.4.3 Settings - Camera

In the Camera submenu, you can control various camera settings.



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Mode Manual Aperture - F3.4 + Shutter Speed - In s + Gain - Exposure Comp. - White Balance - Mode Manual Calibrate - Auto Calibrate w/light -	Autofocus			-
Aperture – F3.4 + Shutter Speed – 1/1 s + Gain – 25.0 dB + Exposure Comp. – Off + Mode Manual - Collibrate Auto Calibrate w/light Lens –	Mode		Manual	
Shutter Speed - 1/1 s + Gain - 25.0 dB + Exposure Comp Off + White Balance Mode Manual - Calibrate Auto Calibrate w/light	Aperture		F3.4	
Gain - 25.0 dB + Exposure Comp Off + White Balance - Mode Manual - Calibrate Auto Calibrate w/light	Shutter Speed		1/1 s	
Exposure Comp Off + White Balance Manual - Calibrate Auto Calibrate w/light Lens	Gain			
White Balance Mode Manual - Calibrate Auto Calibrate w/light	Exposure Comp.			
Mode Manual - Calibrate Auto Calibrate w/light — Lens —	-			5—
Calibrate Auto Calibrate w/light Lens	Mode		Manual	
Auto Calibrate w/light	Calibrate			
Lens	Auto Calibrate w/l			•

Lens

For accurate magnification level displayed in the Information window, specify the lens currently mounted on the microscope after changing lenses.

When doing so, it's recommended that you use the Automatic Height Adjustment feature under General settings to obtain the right working height.

White Balance

Change how often the microscope will perform a White balance calibration (WBC).

WBCs ensure accurate color display.

- Auto: The microscope will constantly adjust the color temperature of the image to the surrounds to ensure accurate color display.
- the color balance of the microscope's camera to ensure accurate and natural color reproduction under different lighting conditions. WB can only be modified by calibration.
- Indoor: Fixed settings according to color temperature matching general indoor lighting.

As default, the microscope is in Manual mode.

When changing to Manual, two additional settings will become available.

Auto Height Adjustment

By activating the Auto Height Adjustment feature, the microscope will adjust itself to the correct working height, giving you the sharpest image possible. When the adjustment is complete, the feature will deactivate itself until it is reactivated.

It's recommended that you use the Auto Height Adjustment feature when changing lenses or introducing/ removing elevated surfaces underneath your objects.

X





Calibrate

Perform WBC now by placing a Gray card in the microscope's field of view. Alternatively, you can use a white piece of paper.

Auto Calibrate w/light

Enable auto calibrations when integrated light or ring light (if connected) is turned on/off.



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3.2.5 Power controls

Access various power control options.





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3.3 Other features

In this section, you'll learn how to use the microscope's full potential, including features that are not linked to a specific menu feature.

3.3.1 File share

To save photos of your work on the microscope, connect a USB storage device either to the back of the Controller or the back of the microscope.

To access your saved photos, unplug the USB storage device and connect it to your computer. You can now access your photos on the computer and transfer them to a destination of your choice.



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In this section, you'll learn how to handle and do maintenance on your T5O to extend its lifespan. You'll also learn TAGARNO's warranty terms and how to create a support ticket either through your local distributor or directly with TAGARNO.

4 Maintenance & support

4.1 Taking care of your microscope

- Store and use the product in a dry, clean and ventilated room.
- Do not place the product in direct sunlight, next to a radiator/heater or some place where the system may be subjected to liquids.
- All plugs are designed to be used in one way only. Therefore, you should never use force when you connect the system.
- Remember to disconnect all elements if you intend to move the product.

- If you move the product from a cold to a hot room, you must wait at least an hour before you turn it on to avoid short circuits due to condensation.
- Remove the cables by pulling the plug itself never by pulling the cable.
- If the product needs repairing, never do it yourself, contact your distributor.
- When cleaning the product, please turn off the system and wait untill the system has cooled off.

- Clean the product with a damp cloth. Never use strong cleaning agents or chemicals – these may damage the microscope.
- Clean the lens regularly with isopropyl alcohol and a microfiber cloth or with the TAGARNO cleaning kit.
- Please be careful when carrying the product from one place to another. Always lift the assembled microscope by placing one hand around the camera arm and the other hand beneath the base.

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4.2 Warranty

Warranty terms for the product shall be as follows:

TAGARNO warrants that the product will correspond with the specification at the time of delivery and will be free from defects in material and workmanship for a period of 24 months (2 years) from date of shipment (Ex Works). This warranty covers:

- The replacement of defective parts.
- All labor costs to exchange defective parts in product.
- Complete functions test of product before return to end user's site.
- Return transport costs of product from TAGARNO to end user's site.
- The warranty only applies if the product is packed, shipped, stored, handled and maintained correctly.

The warranty does not cover:

- Failures due to improper packing and transport.
- Failures due to drops and sudden blows.
- Failures due to storage and handling in extreme high or low temperatures.
- Failures due to storage or handling in extreme high humidity.

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4.3 Troubleshooting

Below you can find a list of issues that you might experience with your microscope and how to solve them.

Issue		Cause	Step 1	Step 2
1	No power / Device does not turn on.	Power cable is not connected or is loose.	Check that the power cable is firmly connected to the base and plugged into a working power outlet.	
2	Blurry image.	Lens is dirty or object is out of focus.	Clean the lens.	Adjust the working height either manually or automatically. Then, adjust focus either manually or automatically.
3	Image display issues on monitor.	Connection issue between microscope and monitor or	Check HDMI cable for damages or loose connection.	Check that monitor is 24 or 27 inch with FHD or UHD
		unsupported monitor.		resolution on HDMI.
4	Image is colored oddly.	Light conditions have changed since last white balance calibration or white balance calibration was performed on colored surface.	Ensure white/light grey surface under microscope before performing a white balance calibration.	Check HDMI cable and connection between base and monitor.
5	Ruler disappear when I change focus.	Ruler requires locked focus level and correctly adjusted working height to display a clear image.	Adjust the working height either manually or automatically until a clear image is displayed under the ruler.	
6	Magnification figure on live image is not correct.	Lens mounted does not match selected lens in menu.	Select the correct lens in menu.	

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Issue		Cause	Step 1	Step 2
7	Image is too dark or too bright.	Insufficient light or camera settings are not optimal.	Turn on/adjust integrated light or optional ring light.	Activate Auto-Exposure in menu.
				Then, adjust camera settings manually to your needs.
8	Unexpected freeze/ shutdown.	Software crash or overheating.	Turn off the microscope, wait for a couple of minutes, turn it on again.	

or further assistance, please refer to our Support section or visit our website for nore troubleshooting tips and support options.

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4.4 Support

If you experience issues with your microscope, please check the troubleshooting section of this manual.

If you're still unable to solve the issue at hand, please contact the local partner that you bought the microscope from. You should only contact TAGARNO directly if you did not buy the product from a local distributor. In this case, you can create a ticket using the support form on TAGARNO's website:

https://tagarno.com/help-center/

When requesting support, either through a local partner or TAGARNO, you should always state the model number and serial number of your microscope. You can find these information on the product label on the microscope.

4.5 License agreement

This TAGARNO product contains open source and third-party components. For more information, please go to:

www.tagarno.com/license-agreement



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4.6 Technical specifications

Get to know the TAGARNO T50 in more detail by exploring the technical specifications listed below.



- Lens +10: 4.0 mm 86 mm (0.16" 3.39")
- Lens +25: 1.60 mm 10 mm (0.06" 0.39")
- Lens +50: 0.80 mm 5 mm (0.03" 0.20")

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Camera quality

- Camera resolution: 4K (3840x2160), 8.5MP @ 60/50/30Hz
- 60 frames per second
- 25x optical zoom
- Video output: HDMI
- 16:9 aspect ratio



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TAGARNO A/S Finlandsvej 2 8700 Horsens Denmark

PRODUCT

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NAME	MODEL	DESCRIPTION
TAGARNO T50	511010	Inspection Camera Unit

DIRECTIVES/STANDARDS

TAGARNO A/S hereby declares that the product listed above, complies with the following directives:

DIRECTIVE	
2014/35/EU	Low Voltage Directive
2014/30/EU	Electromagnetic Compatibility (EMC)
2011/65/EU	Restriction Og Hazardous Substances (RoHS)
2012/19/EU	Waste Electronical & Electronic Equipment (WEEE)

By conforming to the following harmonized standards and regulations:

STANDARD/REGULATION	
IEC 61326-1:2013	Class A / Industrial Electromagnetic Environment
IEC 61326-2-2:2013	EMC requirement for electrical equipment
IEC 61010-1:2010	IECEE CB Scheme Ref. Cert.No. NO103726
EC 1907/2006	Registration, Evaluation, Authorisation & Restr. of Chemicals (REACH)
FCC / IC	Part 15 Class A / CAN ICES-3 (A)/NMB-3(A)

ISSUED BY

SIGNATURE



DATE (DD/MM-YYYY) 11/09-2024



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Anders Ravnskjær Pedersen, Head of R&D

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All TAGARNO T50 digital microscopes are marked with a product label that is placed on the back of the base.



Values marked on the label with X, Y, M and D are replaced by specific numbers and letters.



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Find more information on how to use the TAGARNO T50 in this appendix.

6.1 Quick user guide

If you want a shortend version of the manual for everyday use of the TAGARNO T50, you can find the Quick user guide here:



Go to Quick user guide.



Questions?

If you have any questions about your microscope, don't hesitate contacting your local distributor or one of our offices in Denmark and United States.

CONTACT US

www.tagarno.com

DENMARK

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