

Installation Instructions for Standalone Version

Hardware requirements

The most straightforward way to set up the *WormTracker* is to use the standalone version, which does not require a MATLAB license but does need pre-configured hardware. For worm tracking, you will need the following specific hardware:

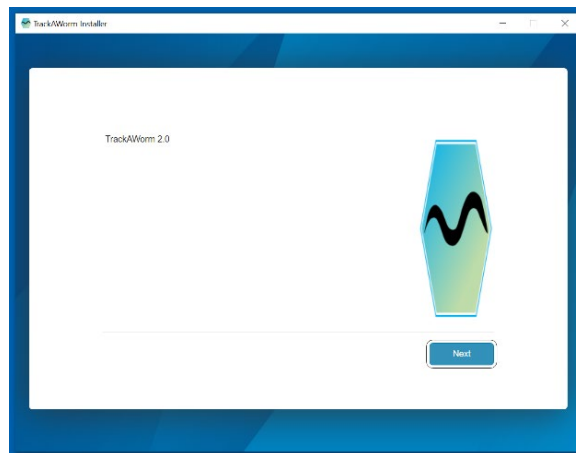
- **Motorized stage:** Optiscan™ ES111, including a stage controller (ES11), a universal specimen holder (H473), a stage stand (H413), and a joystick (CS1521DP) (all from Prior Scientific). The joystick is optional. For convenient use, you may want to request the manufacturer to cut the stage stand height to 1 inch.
- **CMOS camera:** G-040B (Allied Vision), a black-and-white camera using GigE for video output.

Additionally, you need a computer running Windows OS and a stereomicroscope equipped with an illuminated base. There is no specific requirement for the microscope, although image quality can vary with different microscopes.

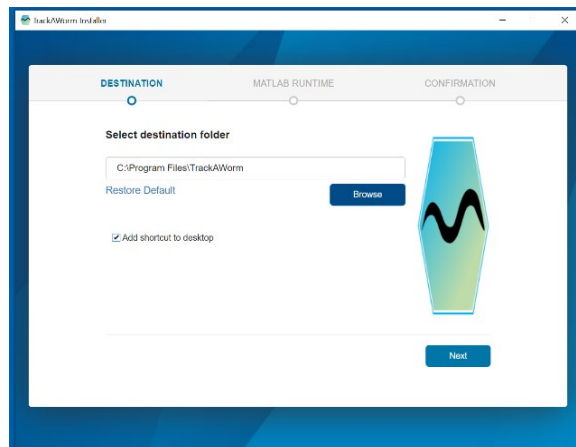
The *SleepTracker* is configured with a different CMOS camera: DMK37BUX273 (Imaging Source).

Track-A-Worm software installation

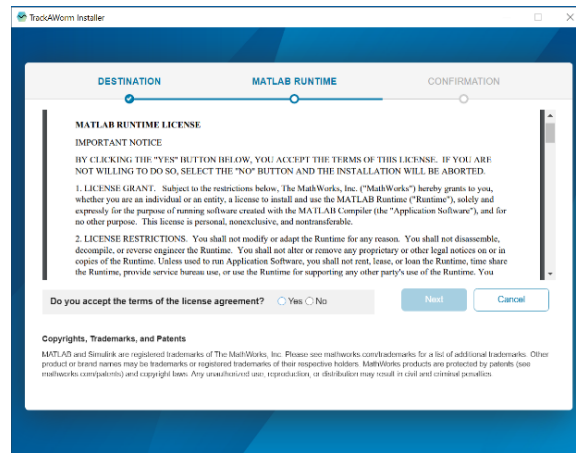
1. Download the compressed installation file *Track-A-Worm v2.zip* from our lab website: <https://health.uconn.edu/worm-lab/track-a-worm/>
2. Run the *Track_A_Worm.exe* file. After the installer window opens, click Next.



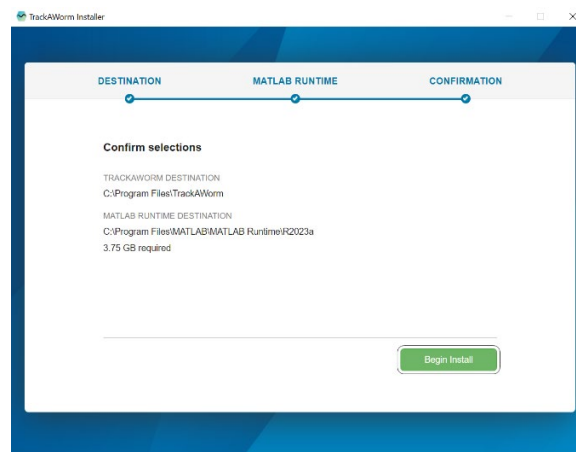
3. Select a destination folder for the installation and check the box to add a desktop shortcut.



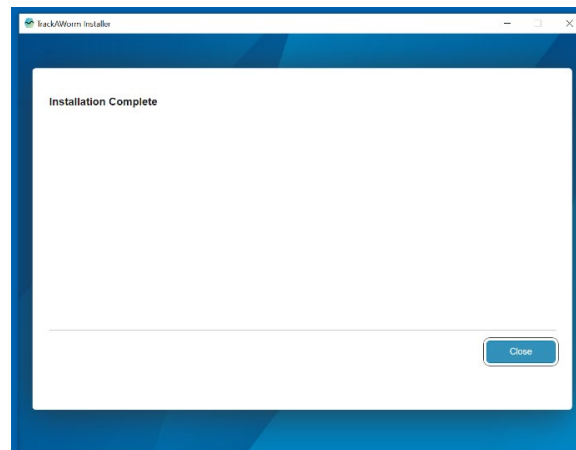
4. Accept the license agreement for MATLAB Runtime.



5. Confirm the destination folders for TrackAWorm and MATLAB Runtime, then begin the installation.



6. Wait until the "Installation Complete" window appears.

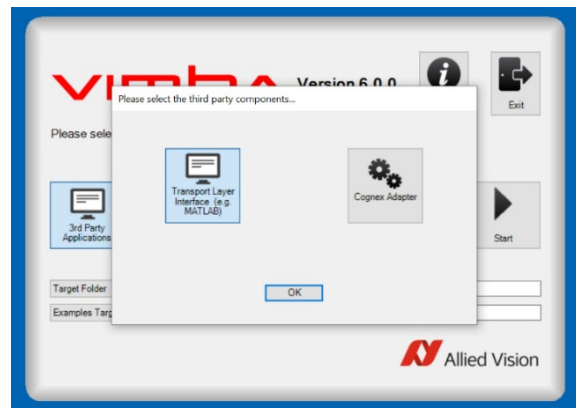


Camera driver installation

1. Download the current version of Vimba (for the CMOS camera) from the manufacturer's website: <https://www.alliedvision.com/en/products/vimba-sdk/>
2. Run the Vimba Driver installer, select the option 3rd Party Applications, and proceed with the installation.



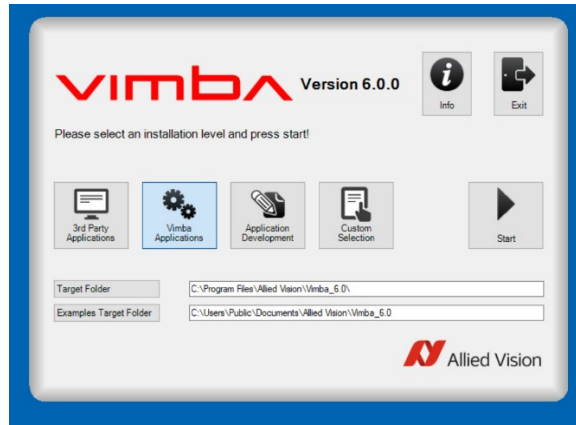
3. Select the Transport Layer Interface (e.g. MATLAB) and click OK.



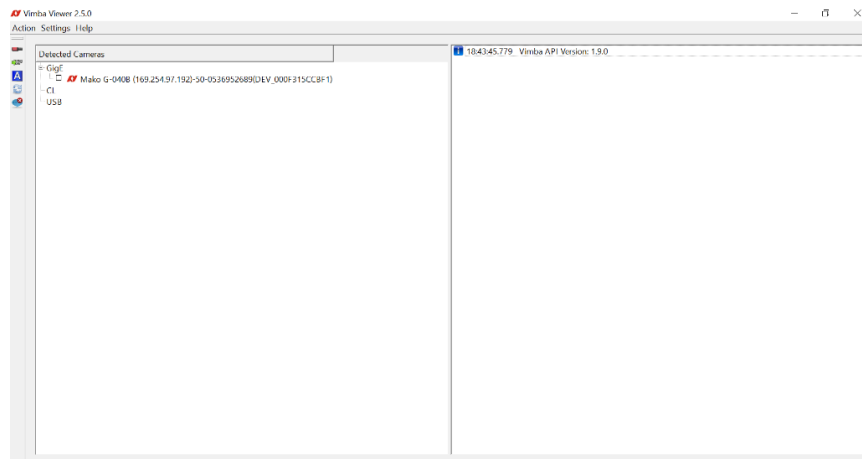
4. Confirm the installation is complete and exit the installer.



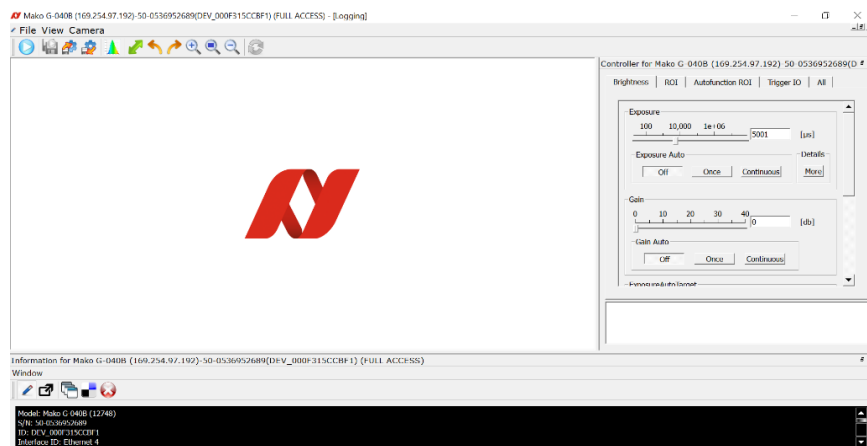
5. If you want to install the Vimba Viewer as well, restart the Vimba installer, click on Vimba Applications, and select Camera Demonstration.



6. Open Vimba Viewer to confirm your camera is detected.

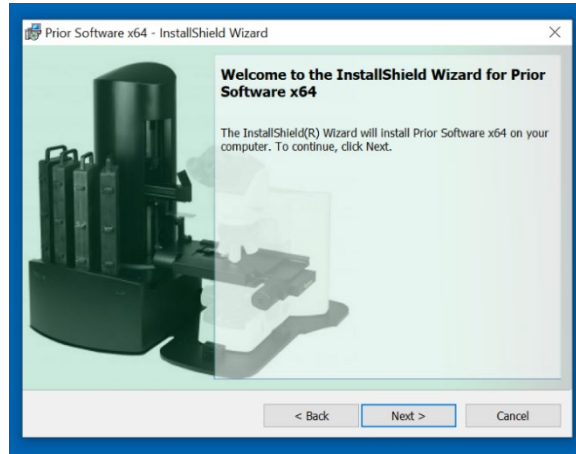


7. Select the camera and click Play to confirm the camera is functioning properly.

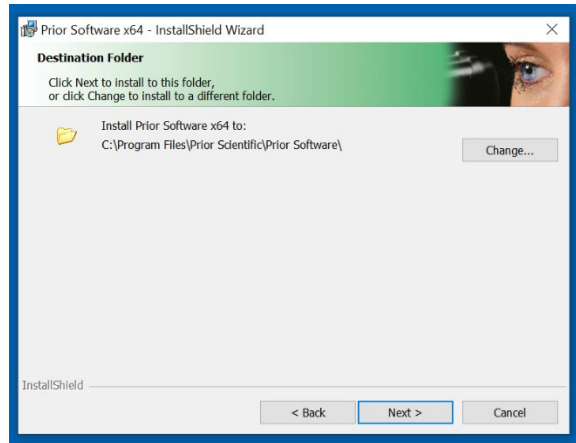


Stage driver and application software installation

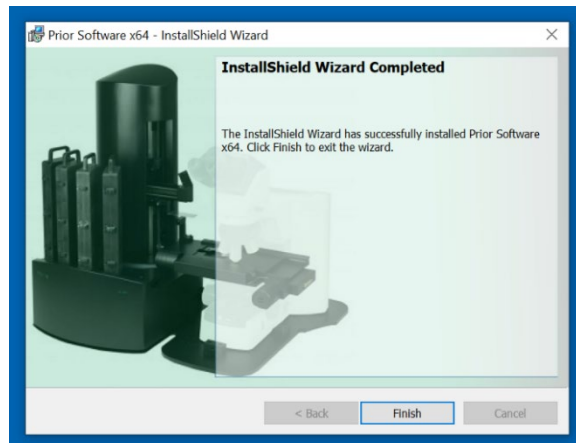
1. Download the “64 Bit Prior Scientific DLL SDK – for installation of Prior terminal and Prior demo programs” (v8.6.5) from the manufacturer’s website: <https://www.prior.com/download-category/software>
2. Run the downloaded file.



3. Select the destination folder and begin the installation.



4. Confirm the installation is complete.



Stage Functionality Verification and COM Number Identification

Before using the stage in *Track-A-Worm*, run the Prior Terminal application (installed from the Prior software package) to verify stage functionality and identify the assigned COM number with the following steps.

1. Run the Terminal application.
2. Check the bottom left for the connected COM number and make a note of it. This COM number is needed to enter into the Record module of *WormTracker*.
3. Type “?” and press Enter to see the following:
Optiscan information
Drive chips 11111
Joystick not fitted
Stage = ES111/1
Focus = None
Filter_1 = None
Filter_2 = None
Shutters = 000
End
4. Test the stage movement by typing each command and pressing Enter: “l,10000”, “r,10000”, “b,10000”, and “f,10000”. The stage should move left, right, backward, and forward, respectively. Each movement covers 1.0 cm when the stage resolution is set to 1.0 μm .

Manual Re-Centering of the Motorized Stage

By default, the stage controller knows the center of the stage. However, in extremely rare cases, this information can be lost. As a result, you may not be able to properly center the stage in the *WormTracker*. Follow the steps below to re-center the stage:

1. Run the Terminal application.
2. Type “g,**10000,10000**” and press Enter to observe the stage move to the extreme ends of X and Y.
3. Press Enter again to observe two numbers (e.g. 63509,78591).
4. Type “g,**-10000,-10000**” to observe the stage move to the OPPOSITE extreme ends.
5. Press Enter again to observe two negative numbers (e.g. -63189, -47486).
6. Type “gr,63349,63038”, which is $\frac{1}{2}$ of the sum of the two numbers (use absolute numbers) in step 2 and 4 [e. g. $(63509+63189)/2 = 63349$; $(78591+47486)/2 = 63038$] and press Enter to observe the stage move to the center.
7. Type “z” and press Enter to save the stage center.
8. Type “m” and press Enter to recall the center.

The numbers in bold are for a stage resolution of 1.0 μm . You must increase them by 10 and 100 times for stage resolutions of 0.1 μm and 0.01 μm , respectively. The higher resolutions are not needed for worm tracking.

The stage controller remembers the new stage center.

Changing Stage Resolution

1. Run the Terminal application.
2. Type “res,s” and press Enter to see the current stage resolution. It can be 1, 0.1, or 0.01 μm .
3. To change the resolution to 1 μm , type “res,s,1” and press Enter.
4. You can confirm the change by repeating step 1.

If you have any questions about the stage, you should contact Prior Scientific. Their technical support is easily accessible by phone.