

TimeTronics

Manual

Argus Photo Finish User Guide
v2.32.0



June 2025

SPORT TIMING SYSTEMS



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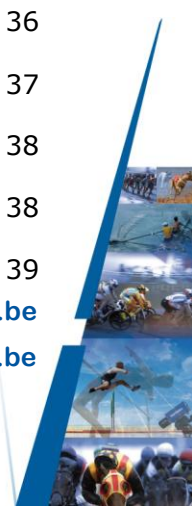
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Welcome to the Argus Quick Start user manual.

This guide is designed to explain the software functionalities of TimeTronics' Argus photofinish software. Hardware setups can vary significantly between different sports and installations, so they are only briefly covered in this document.

Please note that all images in this manual are examples; the version you receive may differ slightly from what is shown. Most images in this manual are based on Argus version 2.32.0.

If you have any questions regarding the operation or service of this or any other TimeTronics equipment after reading this document, please contact your local distributor or TimeTronics directly via email at info@timetronics.be or by phone at +32 (0) 14 23 19 11.

We also welcome any feedback or suggestions regarding this user manual at info@timetronics.be.

Thank you for choosing TimeTronics products and services. We wish you success in using Argus.

Sincerely,

The editors

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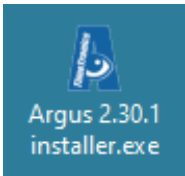
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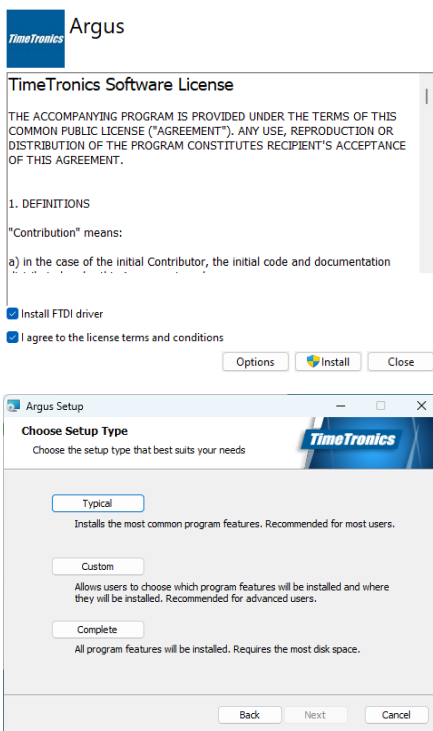
Installation and first launch

Before launching the Argus software for the first time, you need to complete the installation process. Additionally, there are some key points to address before you can start using your Argus photo finish camera.

Installation



You can launch the installer that can be downloaded from <https://www.timetronics.be> (follow menu Support > Software). The installation is a straightforward process, you are guided by the installer. Some topics to pay attention to:

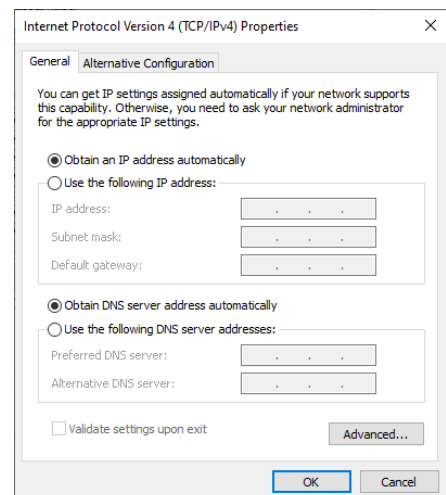


In the first screen, you have an option to “Install FTDI driver”. If you plan on using any TimeTronics-device connected through USB, be it a scoreboard, a wind gauge or an arrival controller, you are advised to install this driver at this stage. As the installation continues, several windows will open, you’ll recognize different installation procedures for the FTDI-devices, for the camera network driver and for the actual software itself.

If you are asked to select a custom or a typical installation. We strongly recommend to go for the typical installation, only if you really plan to use the installation always without a camera and you don’t want to install the camera network driver, you could go for the custom installation.

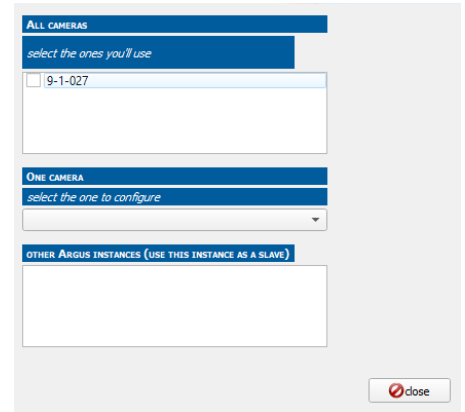
Ethernet Settings

Please make sure that your Ethernet connection settings are set to ‘Obtain an IP address automatically’ for the network adapter that you are intended to use to connect the Argus camera. This option can be found in the ‘Change adapter settings’ of your ‘Network and Sharing Centre’. The reason is because the default settings for an Argus camera are also to get an IP address automatically. The settings of the camera need to match the settings of the network adapter.

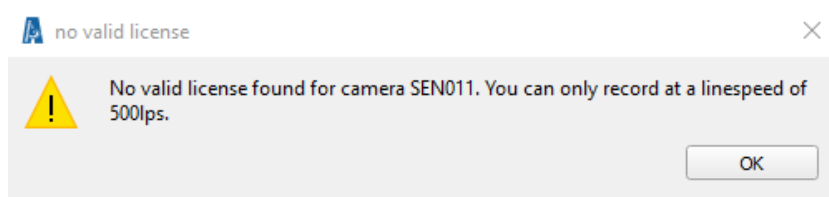


License Key

When launching the software for the first time, you will be presented with the camera connection window. This is where you will see your new Argus camera ready for connection.

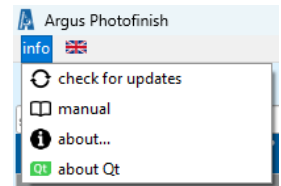


When you press the check box next to the camera to connect to it, a 'no valid license' window prompt will appear. We now need to install the license key of the camera to enable the functionalities which you have purchased.



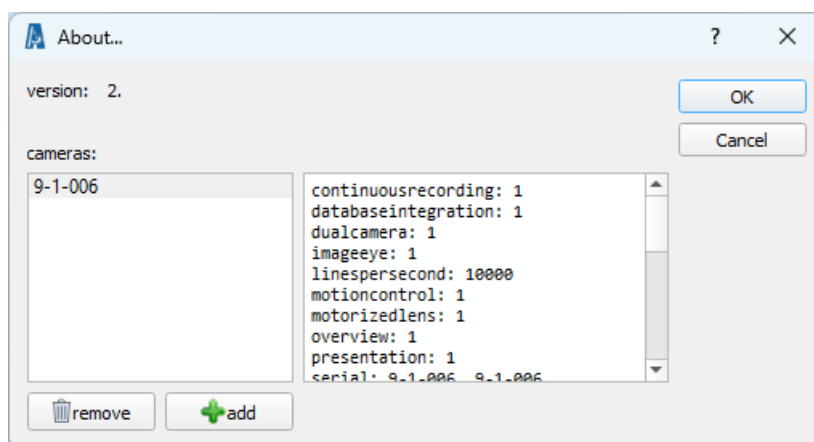
First you will need to locate the licence key for your camera. This can be found on the TimeTronics USB drive inside the carry case of your Argus photo finish camera delivery. The file you require will be Argus xx-xx-xx.lic (where xx-xx-xx is replaced by the serial number of your camera).

To load the licence key into the Argus software, you need to go to the info-menu on the top left of the software window and press 'about...'



In the 'About' window, press the '+add' icon and locate your .lic file to load into the software.

When this has loaded correctly, the serial number of your photo finish camera will appear in the 'About' window and you will see (when you click on the camera number) the camera functionality information to the right.

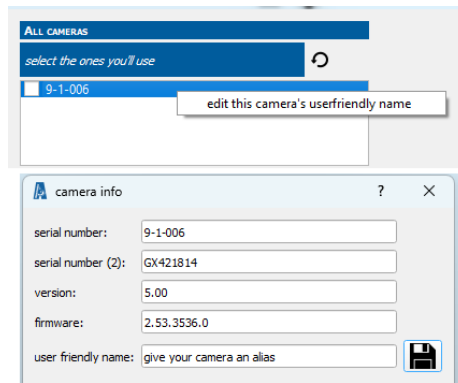


You can now close this window and begin to use your new Argus photo finish camera!

IMPORTANT NOTE: Every camera requires 30 GB of space on your hard disk. For example, if you have entered the serial number of 3 cameras, this will take up 90 GB of space on your disk. To free up this space, you will need to remove the camera license in the Argus software and remove the folder with the serial number in the folder: C:\photofinish on your PC. If you delete a map of a certain camera, you will relieve 30 GB of data, however, please note that you will also delete your licence key so be sure you have a copy of it before completing this action.

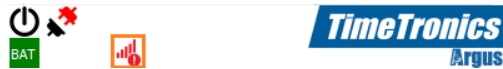
User friendly camera name

If you have multiple cameras, it can be helpful to assign them more descriptive names instead of just using their serial numbers. For example, in track cycling, you might name them "camera-on-red" and "camera-on-finish," or in athletics, "main-camera" and "inside-camera." To do this, right-click on the camera's serial number in the list of available cameras (the camera process can't be started yet). Enter a new alias for your camera and remember to save it using the save button. The alias will be stored in the camera hardware, not just on your computer.

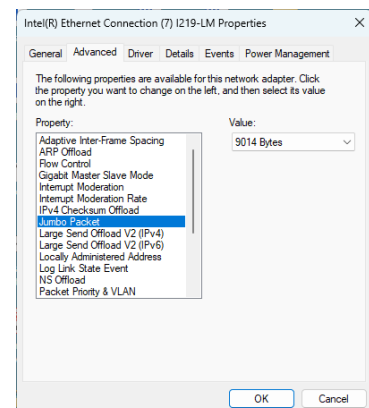


Jumbo frames

An Argus camera is streaming in a very fast tempo image data to your computer. To optimize this datastream, it is advised that the camera can send it in larger packets than usual network traffic. This is called the "jumbo frames"-option of your network adapter. This option should be enabled for the network adapter you are intended to use to connect the Argus camera. The software indicates also that this setting is not OK with a red network-warning-icon in the bottom-left part of the screen.

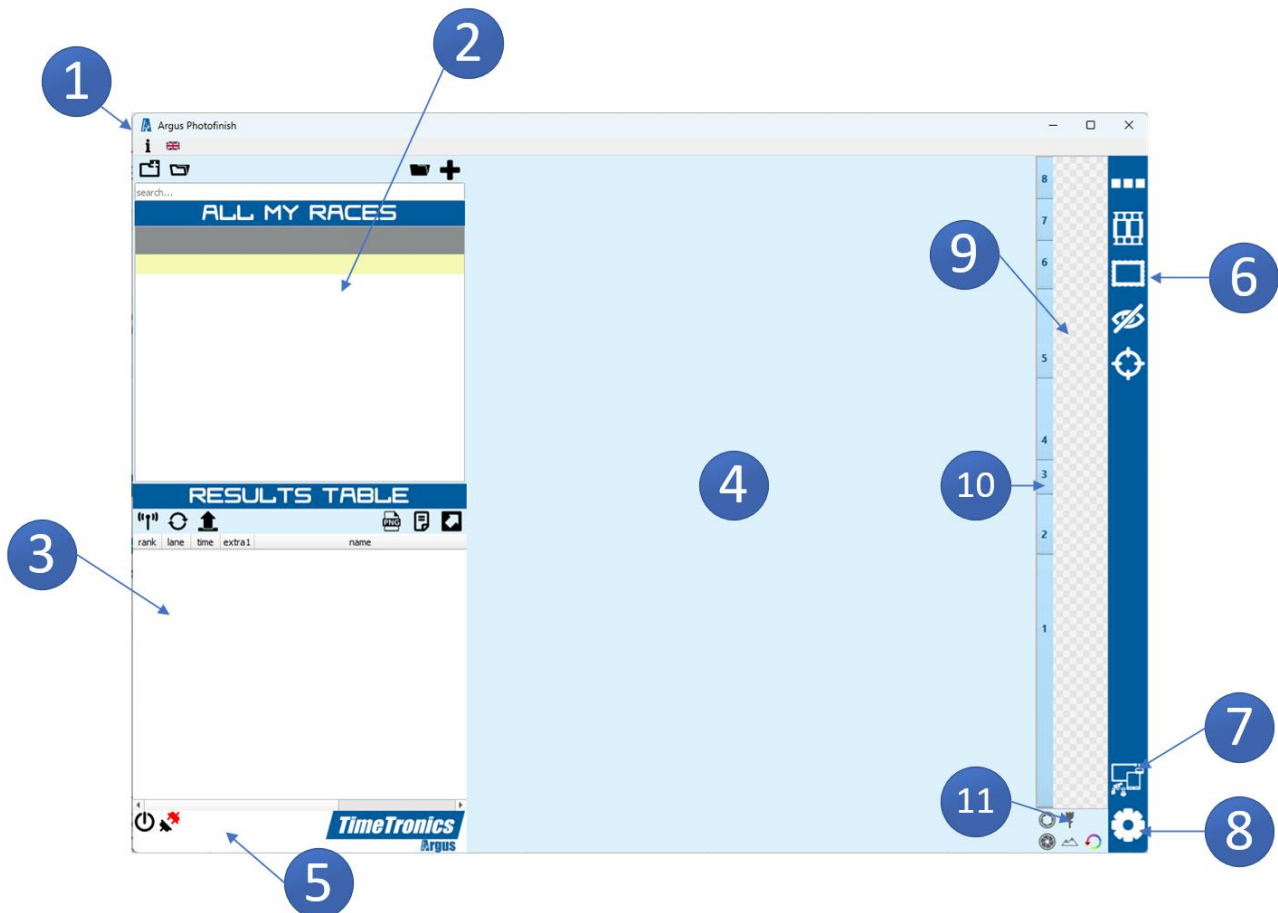


You can find the "jumbo frames"-option in Control Panel\Network and Internet\Network Connections, right click on the network adapter of your choice and select Properties. In the main tab (at the top), select the option to configure the adapters driver. In the new popup-window, go to the tab Advanced and find the option "jumbo frames", set it to the highest possible value (probably 9014 bytes or 9k).



Overview of all screens

You are about to take-off for real now. Let's start with a quick overview of the general setup of Argus-windows. All is explained very briefly here, more profound info comes in later chapters.



1. In the top-menu, you'll find options to
 - a. Check for a software update (you need internet access)
 - b. Download the manual (you need internet access)
 - c. View general info and enter your license number
 - d. Some legal notices regarding building blocks of the Argus software
 - e. Change the user interface to reflect a language of your choice. Available languages at the moment of writing or Czech, German, English, Spanish, French, Italian, Korean, Dutch and Russian. If you are missing your language and you are interested to make a translation, please contact info@timetronics.be.



2. Here is where all the races that you have created for your competition will be listed. These can either be created manually using the Argus software or imported via AthleticsManager / Atletiek.nu / Excel import / ... (refer to the chapter about integration methods for detailed information).

search...

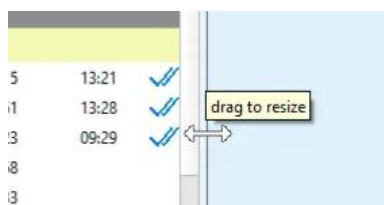
ALL MY RACES	
LEE VALLEY TEST	
60m SM Final	18:13
60m U20W Final	18:05
60m U20M Final	18:00
60m SW Final	17:55
60m SM Semi 4	17:46
60m SM Semi 3	17:43
60m SM Semi 2	17:37
60m SM Semi 1	17:34
60m U20W Semi 2	17:27
60m U20W Semi 1	17:24
60m U20m Semi 3	17:15
60m U20m Semi 2	17:12
60m U20M Semi 1	17:09
60m SW Semi 2	16:57

NOTE: For previous users of TimeTronics MacFinish cameras, in the past you would normally link a photo finish recording of a race to the database race information after the race has been completed. However, as the Argus camera is a LIVE RECORDING camera, you must first create a race that you will then save the live recording too.

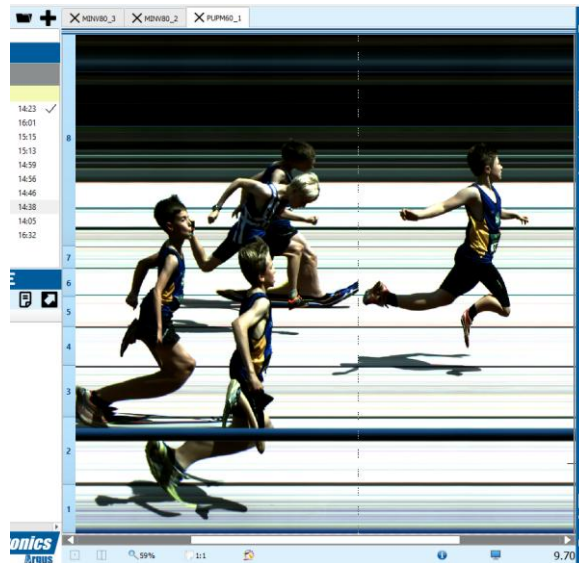
- The Results Table section of the software is where you will see all the data in relation to the results of your photo finish picture. Race data is obtained by importing information from an external race management software.

RESULTS TABLE					
rank	BIB	lane	time	name	extra1
1	291	8	1:25.23	Dylan Stevens	U17
2	314	7	1:27.18	Cameron Walker-Powell	U17
3	247	5	1:39.02	Bartosz Porzuczek	V35
4	290	6	1:39.08	Daniel Stevens	V40
5	139	4	1:39.17	Lukas Harber	U17
6	352	3	1:42.83	Luke Newton	U17
7	148	1	1:42.91	Thomas Hockley	U20

Note that you can adjust the size of the left pane if you like to see more of the image, or if you like to see more of the results table.



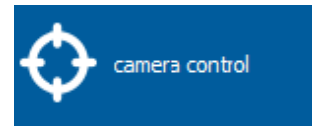
- The main area of the screen will be used for the most important subject, the photofinish picture itself.



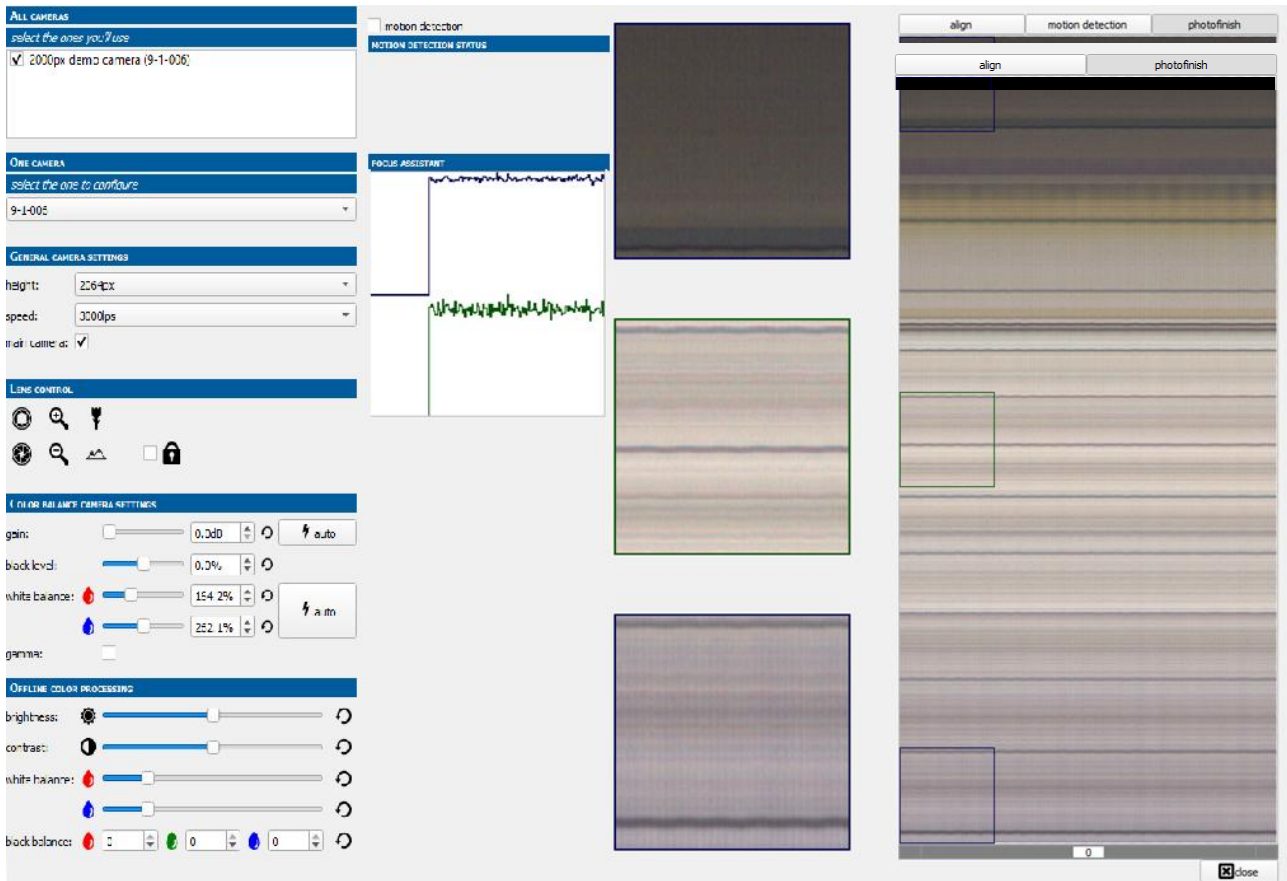
5. At the bottom-left is, always in-sight, the status of the connected camera. Also statuses of other devices, e.g. a transponder system, will be shown here for immediate attention.
6. At the right side is a menu bar, the top-side of that holds buttons to access the continuous-recording-window, enable the overview of a photofinish picture, access the scrolling preview or image-eye-zoom and open the camera control. All these functions are discussed in more detail later.
7. With this button, you open all settings to connect Argus with other devices, like a scoreboard, a transponder system, a wind gauge, ...
8. Here are the general settings, like changing the layout for a specific sport, ...
9. On the right side of the screen, you can open a preview window with a live view of the camera that is connected. The same area is also used for a zoom-function, the image-eye-zoom (later more on this).
10. In the preview as well as in the photofinish picture, there can be a view of the lanes, depending on the sport (for athletics and rowing this view is available). This view is very useful when processing the results and identifying the athlete by the lane he is in.
11. At the bottom of the preview window, there are some buttons for quick access to camera control features. Only settings that have no influence on the alignment of the camera, are available here.

Camera Control

Before recording photo finish images, we need to align the Argus camera and ensure the settings are optimal for your sport. Click on the 'Camera Control' icon to open the camera control window.



This window has two tabs at the top right: "Align" and "Photo Finish." The "Align" tab displays the camera's 2D view of the finish area, while the "Photo Finish" tab shows a scrolling preview of what the photo finish camera will actually record.



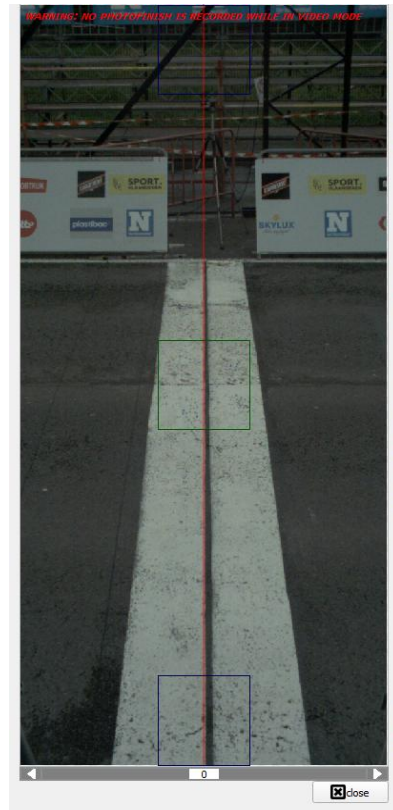
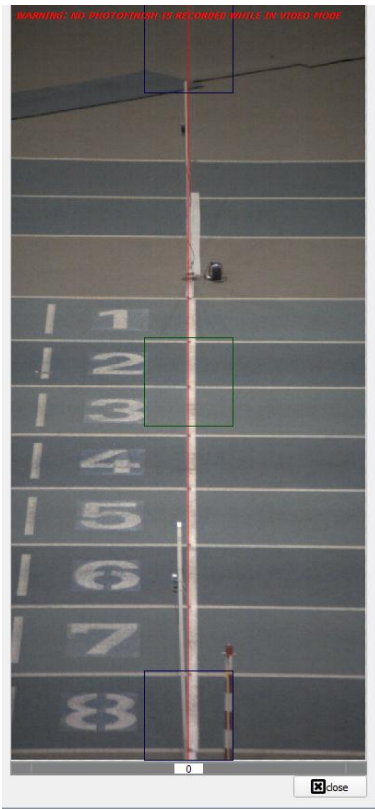
First, we must make sure the basic settings of the camera are optimised before we attempt alignment.

Initial Settings

Before aligning the camera, we need to ensure that the recording speed and lens iris settings are correct. Proper settings will ensure good lighting conditions, making alignment much easier. First, switch to the "Align" tab to quickly see how changes to these settings affect the lighting quality of the photo finish image. Pressing the "Align" tab will put the camera into 2D mode.



On the right-hand side of the camera control window, you can now see a 2D view of the finish area that the camera is pointing at. Here are examples of the 2D finish area views for athletics and cycling (please note, these cameras have already been aligned with the finish line).



We can now adjust the recording speed of the camera and the lens control of the iris to give us good lightning conditions of the 2D view and therefore assisting us with aligning the camera.

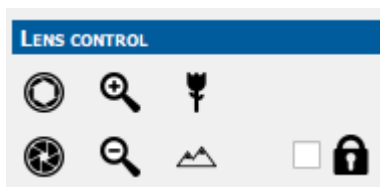
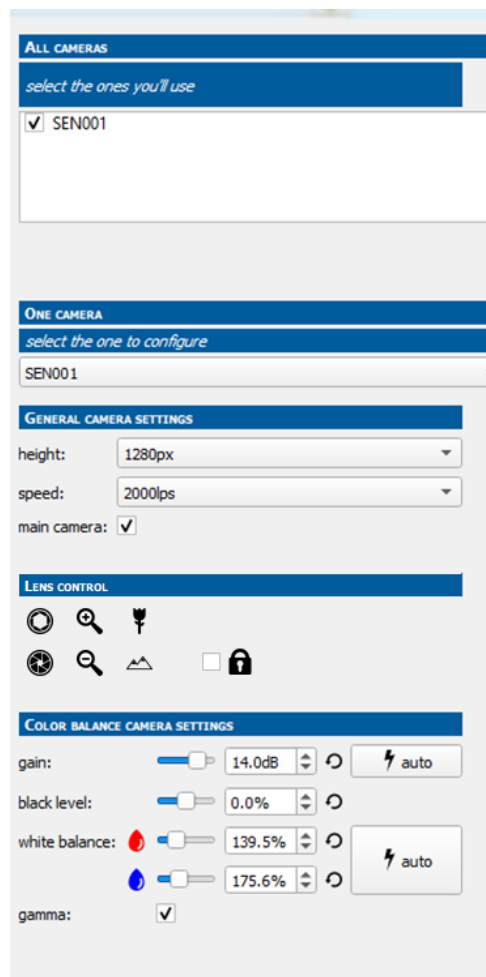
First, we must select the correct recording speed, or lines per second, of the camera for your sport and lightning conditions.

This can be done easily by selecting your desired speed in the drop-down menu 'speed' in the 'General Camera Settings' section.

As an example, we recommend; for athletics 1,000 – 2,000 lines, greyhound 2,000-4,000 lines and horse racing/cycling 5,000 lines. Remember, the higher the recording speed, the better the ambient lighting conditions at the finish line need to be, however the more detailed a picture you will record.

Once an appropriate recording speed has been selected, you now need to adjust the iris of the lens to give the best lighting picture shown in the 2D view. If you have a manual lens, you will need to physically open and close the iris yourself on the lens, however if you have a motorized lens, you can use the 'Lens Control' function in the camera control to do this from the PC.

Using the automatic lens control icons, you can left click on your mouse to move a big step (click: lens starts moving ; release: lens stops moving) and right click to move a small step for finer adjustments (quickly right-click to see the image change slowly). Please adjust until you have a 2D view with an optimum brightness level. There is also an option to lock the lens-settings. This is done to prevent that you accidentally click on a button that can change the lens-settings in a way that your camera alignment is affected.



If you are setting up in low light levels or floodlighting, we recommend turning on the gamma option in the 'Color Balance Camera Settings' below the lens control.

Camera Adjustment

Now we have a good image in the Align section of the camera control, we now need to physically move the camera to align it perfectly with the finish line. [To start i](#)

Checking the Spirit Level on the Camera

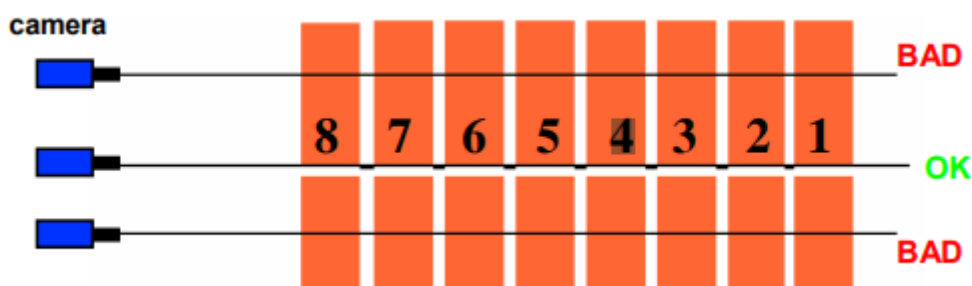
Use the spirit level mounted underneath the camera to position the camera perfectly horizontally. If the camera is tilted to the left or right, you will have a lot of problems in the following steps to record the FULL finish line, the line that you will record will cross over the finish line, and not overlap it.

IMPORTANT; When you move the camera to the left or right (finding the extension of the finish line), or up and down (tilt adjustment), then first check that the camera is still perfectly horizontal (check spirit level). If not, re-adjust it before continuing.



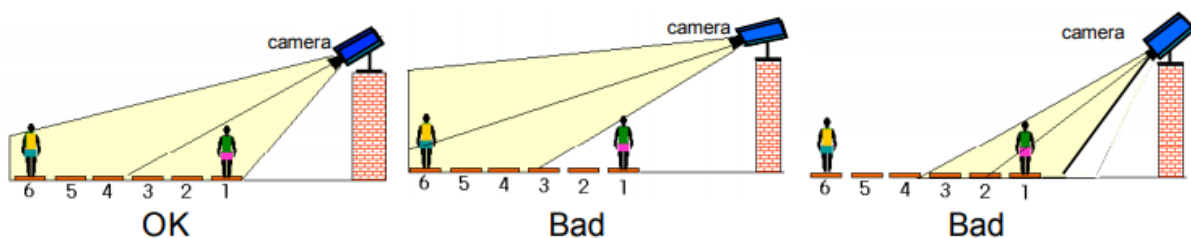
In Extension of the Finish line

For every sport, it is particularly important that the camera is set up exactly in the extension of the finish line and that the camera's range of vision covers the entire finish line (all lanes).



Camera's Vertical Direction (TILT), and lens zoom

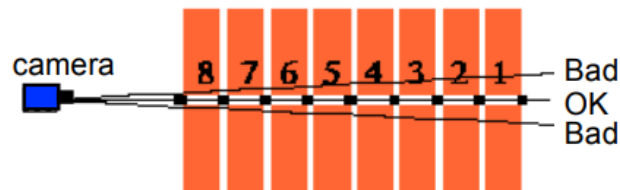
You will have to adjust the camera so that all athletes (in any lane 1...8) or horses or bicycles, are completely visible, from top to bottom. You can do this by looking at the 2D-view and having two athletes standing near the finish line. One should stand in the closest lane and the other in the outside of the furthest lane; both athletes must come into the camera's range of vision so that afterwards times can be read off correctly. This means that you will now have to adjust the vertical direction of the camera (= 'tilt') AND the zoom of the lens.



NOTE: For competitions with long-distance races only in Track & Field, you can 'zoom in' on lane 1 - 4, to have a more detailed picture of these races. However, this carries a small risk that an athlete would finish in lane 5 or 6... Be careful with this, we do not advise you to do this if you are not yet very experienced with photo finish.

Camera's Horizontal Direction

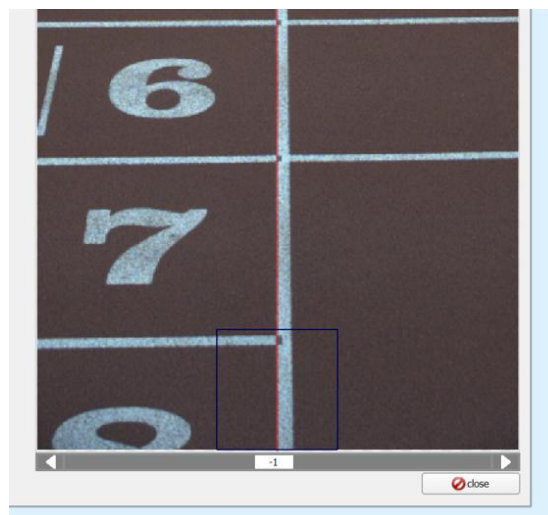
The next job is to direct the camera horizontally at the front of the finish line.



A smooth and accurate horizontal adjustment of the camera can be done by a small movement (a few mm) of one leg of the camera tripod, in a direction so that the tripod and camera 'turn' a little bit.

For the Argus camera, it is not necessary to have the camera physically aligned with the front edge of the finish line perfectly, as it is possible to move the photo finish recording line (red line) within the software.

You will note at the bottom of both the align and photo finish tab there is a slider icon.



You can move this left or right and you will notice that the photo finish recording line will move in the direction that you have moved the slider. Please note, the movement is limited to a certain amount.

This means that if you have the red line in perfect parallel alignment with the front edge of the finish line and are a few cms away from it, instead of having to move the tripod/device that the

camera is mounted on, you can now just digitally move the photo finish recording line so that it will become in perfect vertical alignment with the front edge of the finish line.

You can do this in both align mode and photo finish mode. We recommend doing this in photo finish mode to fine tune the position of the camera in relation to the finish line.

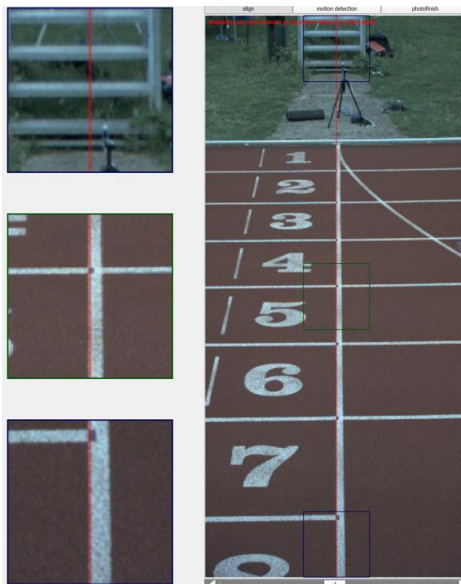
At this stage we have the following:

- Good camera recording settings
- Good Iris/light setting
- Good spirit level setting
- Good zoom/vertical direction setting
- Good horizontal positioning

Camera's Focus

We now need to complete the focus and colour balance settings before we begin taking your first photo finish images.

When in the align view, you will notice that there are 3 boxes along the red photo finish recording line. These are correlated to the 3 zoomed area boxes to the left of the 2D view and are there to assist with optimal focus/alignment. You will see that there are 2 blue boxes (one to the top and one to the bottom of the line) and one green box in the middle of the line. The blue boxes are fixed; however, the green box is movable and can be clicked and dragged to anywhere on the red line that you desire.



The above image shows a finish line with good focus; however, it is likely that your image will be not as sharp and therefore blurry. We need to adjust the focus on the lens and when we do this, we need to keep an eye on the picture to see when we think the focus quality is best.

For competitions where you will be using the entire length of the finish line, you will need to concentrate on the middle of the finish area having the best focus. In the above image, this would mean looking at lanes 3&4 when judging the focus quality.

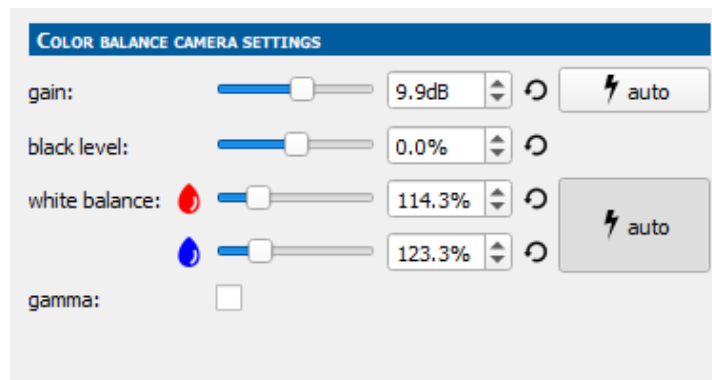
For competitions where you will be using mainly one side of the finish line (for example a competition with 2 sprint races, but 20 endurance races) you need to concentrate on the inside or outside part of the finish line (depending on your camera location) that you will mainly be using. In the above image, this would mean looking from the outside of lane 2 to the top of the photo finish image when judging the focus quality.

We now know what part of the finish line we want to concentrate on when judging the image quality and now we need to make the focus adjustments. The focus lens adjustment is located to the left in the 'Lens Control' and the control is the same as with the Iris; you can left click on your mouse to move a big step and right click to move a small step for finer adjustments.

We recommend first seeing the full range of the focus before attempting to judge the best focus. Whilst still in the align tab, click either the focus near or far icons until you see no further change in the photo finish 2D view. Now left mouse click and hold the opposite focus control icon to what you have just used, and you should start to notice that the image will go from blurry to sharp and then blurry again. Try to make a mental note of when you thought during the focus cycle you saw the best quality. Now use the focus controls (left mouse click) to slowly go back to that point and get the best focus image. When you are at a point where you judge to have good focus, use the right mouse click. Try to focus on something small on the finish line to really refine the focus level. As an example, if there are no athletes on the track, put a hurdle across the finish line (parallel to the inside edge) and try to focus on the text of the hurdle.

Camera's Colour Balance

The cameras colour settings can be altered in the 'Color Balance Camera Settings' area. You will see there are 4 options to adjust: Gain, black level, white balance and gamma.



Gain:

Gain is an electronic amplification of the video signal. This adds more voltage to the pixels on your photo finish image causing them to amplify their intensity and therefore brighten up your image.

Black Level

With the black level setting from the colour balance you can adjust the level of brightness of the black part of the image resulting in a pure black color. This adjustment is done inside the camera (on sensor level) which is different from the offline color processing which affects the digital image. You can adjust a grey part of the image to become blacker, in 99% of occasions the default value of 0.0% is fine.

White Balance

As the name suggests, white balance *balances* the colour temperature in your image. How does it do this? It adds the opposite color to the image to bring the colour temperature back to neutral. Instead of whites appearing blue or orange, they should appear white after correctly white balancing an image.

The good news is, adjusting the white balance is very easy. Simply press on the auto button to the right and after a few seconds, the software will calculate the best settings for you.

Normally it would not be needed to adjust this further, however if you are setting up your camera in daylight and the competition goes on until the hours of darkness under floodlights, it would be recommended to do this auto function one further time when the floodlights are on due to the significant change in ambient lighting conditions.

Gamma:

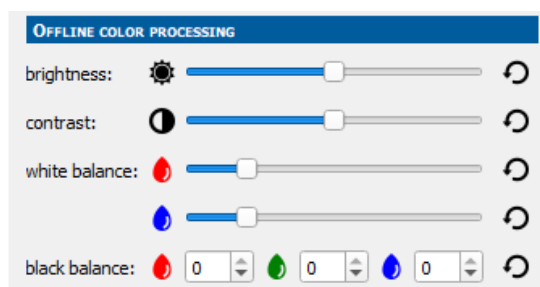
Gamma defines the relationship between a pixel's numerical value and its actual luminance. Our eyes do not perceive light the way cameras do. With a digital camera, when twice the number of photons hit the sensor, it receives twice the signal. Our eyes perceive twice the light as being only a fraction brighter. So compared to a camera, our eyes are much more sensitive to changes in dark tones than we are to similar changes in bright tones.

By performing a gamma correction, dark tonal levels will be redistributed closer to how our eyes perceive them, therefore becoming brighter. So in photo finish, gamma can be used to adjust dark images to become brighter.

Click the check box to enable the gamma feature. We recommend using this during any night-time competitions and day light competitions where there is substantial cloud cover.

Camera's Colour Balance

The final step in adjusting the cameras image quality is the offline color processing.



This is a method of colour processing which affects the digital image.

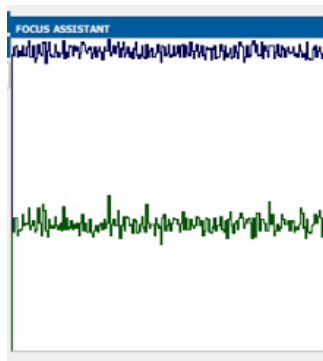
NOTE: We recommend having all the values set to default as this colour processing can be best completed when you have taken your first photo finish image. To make sure all the values are at default, please press the rewind icon to the right of each slider bar.

If you still require some enhancements to the brightness/light intensity of the photo finish picture, please increase the contrast and or brightness slider bar to the right until you see a desired effect.

To confirm you have aligned your camera well to the finish line, you can click on the 'photo finish' tab and see the live scrolling camera preview.

For athletics, if you have aligned the camera well, you should see a predominately white background with black lines which indicate the intersections of each lane.

To the left of the photo finish tab, you will see a focus assistant with a linear graph that will depict the software's judgment on the focus quality.



When in this mode, you can make fine adjustments to all settings to optimise your photo finish image.

RGB Values

You may have noticed that when you move your cursor over the photo finish preview you will see RGB values shown as 'RGB=xxx.xxx.xxx'

As well as using your own visual judgment as to the correct brightness of the photo finish image, there are additional RGB values that are shown to help confirm this.



If we close the iris so the pixel values on the finish line will be in the

Each pixel of an image has 3 colour components: red, green and blue. The combination of the 3 describes the colour you see on the screen. When you hover over a pixel, you will see the value of the red, green and blue component. The maximum is 255 and the minimum is 0. If all 3 components have a value of 0, you will see a black pixel. If all 3 components have a value of 255, you will see a white pixel.

This is important for the dynamic range of an image. Dynamic range is simply the ratio between the lightest and darkest pixels of the image. On a photo finish image, it is important that the image does not get saturated. E.g. we have opened the iris fully and the sun is shining (partially) into the lens. The image will get totally white, and no objects or shapes can be distinguished and is therefore saturated. We can close the iris until we see the objects (finish line) better. If we hover over the finish line and see values of 240, 239 and 242, the finish line would be perfectly white. But if during a race the sun will shine harder, the pixels on the finish line (and perhaps also of the athletes crossing the line) will exceed to 255, the maximum value. Then we would not have a clear photo finish (we have a low dynamic range).



range of 60 to 100, then we create a higher dynamic range. The finish line would appear to be dark, but we can use the brightness and contrast adjustment afterwards to "correct" the image. And if the sun would shine more during the race (or clouds stop blocking the sun) then we would still have a good (not saturated) photo finish image to process.

In short, do not make your image too saturated/bright. If the three values are above 200, you may need to adjust the various settings on your camera to reduce this and get a better photo finish image. If they are too low, below 60, you may need to increase various settings on your camera to get a brighter image.

The table below overviews all the different tools at your disposal to be able to optimise the lighting conditions of your photo finish image. We recommend a combination of these to be able to produce the best quality image.

Lighting Control Overview

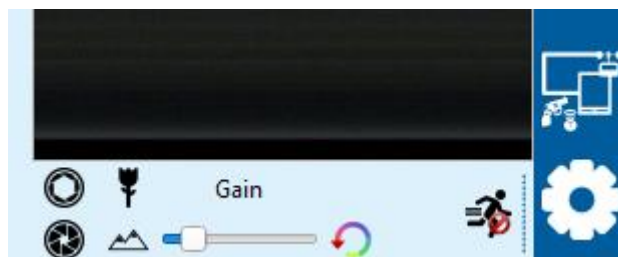
	If your image is too	
	Dark	Bright
<i>Then you can in following order...</i>		
Adjust the Iris	Open	Close
Gamma	On	Off
Camera lines recording rate	Decrease	Increase
Gain	Increase	Decrease
Contrast	Increase	Decrease

As you see, you have more than one choice to solve an image that is too dark. If decreasing the recording speed is not an option and gamma is already enabled, you can choose between opening the iris or increasing the gain. Important in this choice is the effect the iris has on the depth of field (also known as focal depth) of your image. Closing the iris will increase the focal depth. So if your arrival zone is very wide, starting close to the camera and spreading out quite far, it is often difficult to have all objects crossing the finish line “in-focus”. It is better in these situations to keep the iris more closed to increase the focal depth and to use the gain to have a brighter image. In other situations where focus is not an issue, we advise first to open the iris if you want a brighter image.



Quick access to the most important camera settings

The most important camera settings, that have no influence on the camera alignment or also available at the bottom of the scrolling preview window.

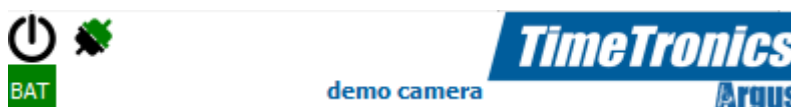


With a click on the small blue bar at the bottom-right, you can make the size of the scrolling preview window smaller. Often you want to have this window in-view all the time, but you don't always want it full-size.

Keep track of the status of the camera

On the left-bottom side, you can always keep track of the current status of the camera. If any network issues appear, you'll notice it here first.


For the power supply status, this is indicated by the box to the very bottom left of these icons. The green box will indicate “POE” (powered by POE of the network adapter), “AUX” (powered by power supply to the rear of the camera) or “BAT” (powered by the power supply of the interface box) to indicate the power source. If the battery voltage drops, the box will first become orange and then change to flashing red if the battery is almost fully discharged.



For the start connection status, you will either see a green symbol, indicating a starting device has been detected, or a red symbol, indicating that a starting device is not connected. This is a

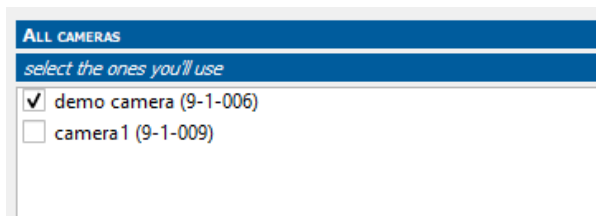
visual aid for the start connection status that is always visible whilst using the software. An audible status/alarm is also available when you have 'armed' a race with no start connection detected, this option will be explored later in the manual.



Further aspects: camera number, calibration and jumbo-frames-status, can be accessed by clicking on the following icon: 

Switch to another camera

If you have multiple camera's and you like to switch from one camera to another, just check on the other camera in the list of available camera's. It takes about half a minute before the other camera is connected. All settings of the camera are remembered, so you don't need to set the recording speed, white balance, ... again.



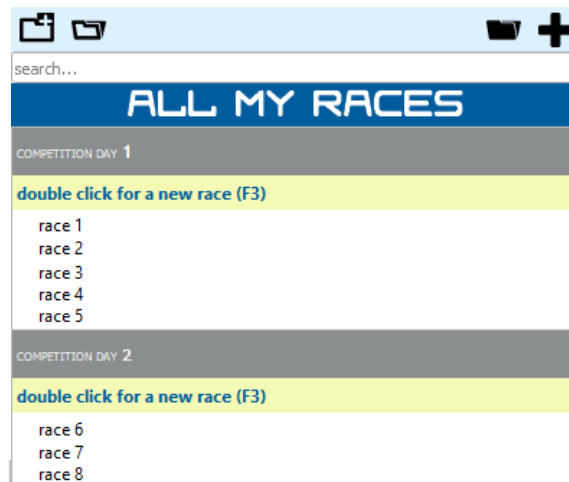
Please note that you can only record images from one camera at a time. If you need the same race recorded with multiple camera's, you need separate Argus-installations.

Recording a race

Bundle races in a folder

You start with creating a folder for your competition, or the day-in-the-competition, or the category-in-the-competition, whatever you feel like a good group of races so you don't lose the overview in the multitude of races.

You can create a folder with the right-most button at the top of the list of races.



If you'd want to search for a particular race, you can filter the long list of races with the search-field on top. It searches by name, but also by category, ID, ... if you use a synchronisation method (later much more on this).

Launch a new race

For all live-folders (later we will learn about archived-folders), you have a list-item you can double-click to launch a new race. Argus tries to guess the name of the next race (it increments the number if the previous race-named ended on a number), but you can choose whatever name you'd like. The shortcut [F3] behaves the same, only if you have multiple live-folders, [F3] will create the new race in the same folder as you created the last race.

This is one way to start a new race, you can also use the +-button at the top-right.

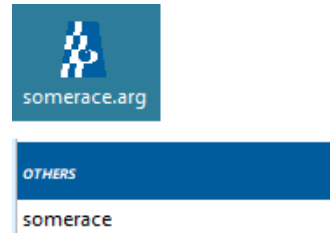
But the simplest way is to use a synchronization-method, then your list of races are already in-place upfront. We'll spend a complete chapter on this later.

Open a race

If the race is in the list, it is as simple as double-clicking the name of the race to open it. Please note that some photofinish images can easily exceed several gigabytes, think e.g. of long cycling races. In order to show you that Argus is busy opening the file, you'll see a small popup window as long as the opening-process is working.

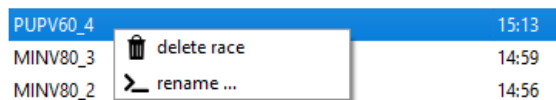
open Argus file...

If you want to send an Argus-file to a colleague, you need to look for a *.arg file in the folder C:\Users\%your username\photofinish_files\%your competition%. If your colleague also installs Argus, he can double-click the *.arg file and it will open automatically in Argus. The file is listed in the folder named "others".



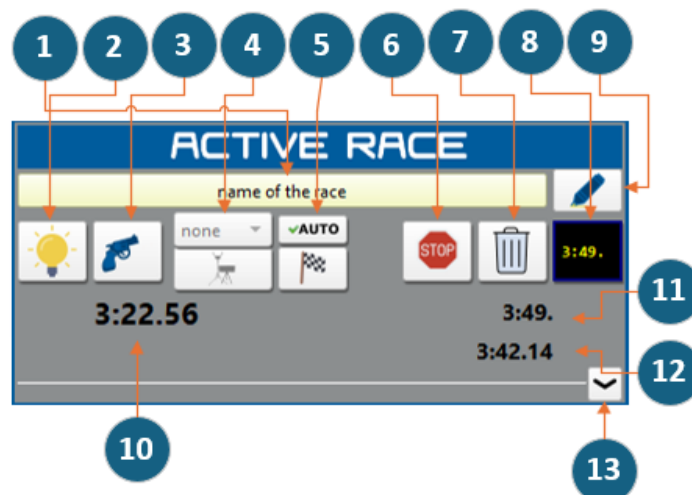
Delete or rename a race

If you right-click on a race, you are presented the options to rename or delete the race. Note that you can't rename or delete a race that is opened, so here the options will be missing.



Race control

During an active race, you have the race control buttons to manage all live actions. We'll start with a brief overview of all controls, later we'll dive deeper into the functionality of the once that need more detailed explanation.



1. This is the name of the race you are currently controlling. It is possible that you have multiple active races, if so, you can click here to select the one you want to control. By default the race in-view of the photofinish-image-area will be the one you control. If you have opened non-active races (recorded before), than the last active-race will remain the current one.
2. The button "arm-for-start", this will control the LED on the starting device (if present) and it will arm the system so that the next start-signal will trigger this race to start.
3. This button gives an indication of the status of the race, if the starting gun is in upwards position, the race has not started yet, shortly after the start signal, an image of a firing starting gun is shown and while the race is running, the starting gun is in a horizontal

position. With a click on this button, you trigger a manual start signal. With a long-click, you open the list of available start signals to select from.

4. In this section you can control the wind measurement feature if applicable for the sport you are running Argus in.
5. These two buttons control the processing of arrival signals. With the small upper button, you can allow or block all hardware arrival signals (and arrivals by motion). The bottom button indicates the status of the hardware arrival signals (an upright flag indicates no-arrival, a flag at an angle indicates a pending arrival signal). You can also trigger a manual arrival with a click on this button.
6. Stop the current race, no extra arrivals are registered. You can "unstop" the race when you long-press this button if you accidentally stopped it, e.g. when you almost missed that last athlete that is half a lap behind.
7. With the trashcan-button you can empty a photofinish image, remove all recorded arrivals. Take care before you use this!
8. Here you see what is being send to the scoreboard (if any is configured). You can switch to another race and still send the running time of this race to the scoreboard. You'll see that this control will change into an arrow when you have multiple active races. If you click on the arrow, you mark that race to be the one to be send to the scoreboard.
9. With this button, you can add a marking in the photofinish image (a shortcut is pressing SPACE-bar, but note that the image must be the active window). The marking can be very useful if the operator wants to mark a passage of an athlete as "probably this athlete was lapped and this is not a finishing-passage".
10. As long as no arrival has been recorded, this shows the running time. After the first arrival, it changes into the time of the first arrival (the winning time).
11. After the first arrival has been recorded, the current running time continues here.
12. And after the first arrival, the time of all next arrival signals is displayed here.
13. With this small arrow, you can unfold the controls for split times and lap times.

The start signals

All start signals are recorded during the race and even the last few start signals before a race are recorded. During a race, you can switch from one recorded start signal to another with a long-press on the start-button.

primary start	type	time	difference to primary start (s)	daytime	source	corrected to (press any key to edit)
5		2:57:45.9143	9.1487	28-05-2024 11:28:25	1	
4		M2:57:42.2150	5.4494	28-05-2024 11:28:21	SW	
3		2:57:36.7656	0.0000	28-05-2024 11:28:16	1	
2		2:56:32.8700	-1:03.8957	28-05-2024 11:28:09	1	
1		2:56:30.9045	-1:05.8611	28-05-2024 11:28:09	1	
0		2:56:25.6872	-1:11.0784	28-05-2024 11:28:09	1	

If you double-click another start signal from the list, the running time and the already-recorded image will change their timescale in reference with the newly selected start signal. You'll notice the different symbols in the column "type" for a software/manual start, a wired hardware start or a wireless hardware start (the type of wireless start device is shown in the column "source").

If you'd like to make the current race start at a specific computer-time, you can correct the start time by typing the correct computer-time in the right-most column and double-click that start item from the list to confirm. This can be useful e.g. in cycling where you know the real start was at a specific daytime, long before you made the setup of the photofinish system.

primary start	type	time	difference to primary start (s)	daytime	source	corrected to (press any key to edit)
3		2:57:36.7656	0.0000	28-05-2024 11:28:16	1	C 28-05-2024 10:00:00.000

A zero gun test

In athletics, a zero-gun-test is mandatory before each session. Argus has a build-in feature for this. Start a new race, make sure it is "armed-for-start" and right-click the start button. Select the option "zero start mode". Wait for the start signal and Argus will automatically record some lines before and some lines after the start signal. The purpose of this zero-gun-test is to check whether the visual indication of the start (the flash or explosion) and the actual time you read in the photofinish image are 0.001s or less. To have a resolution of 0.001s in the photofinish image, it is important that the linerate-setting of your camera is 1000fps or higher.

19.19 The Chief Photo Finish Judge shall be responsible for the functioning of the System. Before the start of the competition, they will meet the technical staff involved and familiarise themselves with the equipment, checking all applicable settings.

In cooperation with the Start Referee (or if one is not appointed, the relevant Running and Race Walking Events Referee) and the Starter, they shall initiate a zero control test, before the beginning of each session, to ensure that the equipment is started automatically by the Starter's signal within the limit identified in Rule 19.13.2 of the Technical Rules (i.e. equal to or less than 0.001 second).

extract from World Athletics' book of rules (C1.1&C2.1 - Competition Rules & Technical Rules, version 17 JAN 2024)

The arrival signals

Hardware arrivals speak for themselves. You have two possible inputs, an arrival which is a simple ON/OFF signal and an arrival-remote-control which is a tristate signal (OFF blocks all hardware arrivals, ON triggers an arrival by itself and AUTO gives control to the arrival signal). The arrival-remote-control exists in two variants, a pure-hardware variant that can be connected to the Argus interface-box and a computer-controlled variant that can be connected through USB on the Argus-computer.

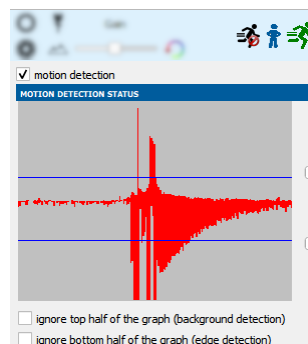
You can also block and allow arrivals, pure by software with the small button on top of the actual arrival-button. This is especially useful when you have multiple simultaneous races as this blocked-state depends on the race while e.g. arrival-remote-control states are camera-related. And you want to record arrivals only for one race (e.g. rowing).



Arrival by motion detection (if supported by your license)

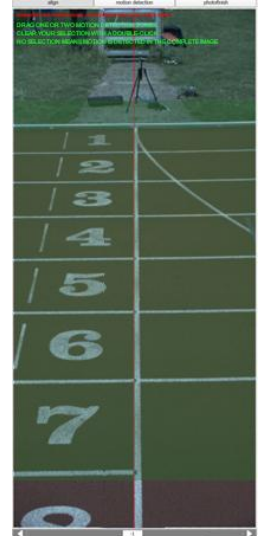
A special feature in Argus is that you can let the camera decide by itself when to record an image, based on objects passing the finish line. This is often referred to as "virtual photocells". Note that when the exact arrival time immediately on a scoreboard is crucial (e.g. athletics), this is probably not the best choice, a true hardware signal with real photocells is most likely a better option.

You can access the motion-detection-settings in two ways, from the camera control window and at the bottom of the scrolling preview window.



Motion detection is a two-way algorithm, it depends on your setup and lightning conditions which of the two (or both) give the best result. You can switch on/off each part of the algorithm with the checkboxes below the graph and adjust the sensitivity with the sliders on the right. The red graph shows you the current values calculated. If the values exceed the blue line, an arrival signal would be triggered. This is indicated with the icon in the scrolling preview window.

Sometimes you have an unstable background that makes this feature hard, think of spectators passing by on the top-side of the image. You can solve this by defining zones in which motion detection must be calculated. This is done in the camera control window. Put your camera in "motion detection"-mode and drag a zone on the video-image. You have the possibility to define two zones. To clear the zones, double-click the video-image and the calculation is reset over the whole image.

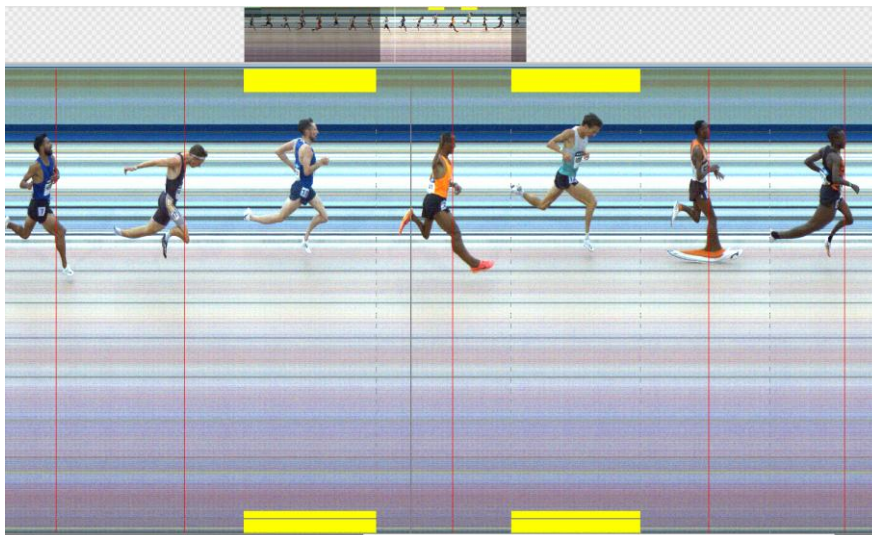


Markings in the photofinish image

With the marker-button in the race-control window, or with [SPACE-bar], you can add a visual marking in the photofinish image. A usecase for this is e.g. when you want to record lapped athletes, just to be sure, but you want to mark them as "probably lapped".

Note: the photofinish image must be the active window for the [SPACE-bar] to be captured.

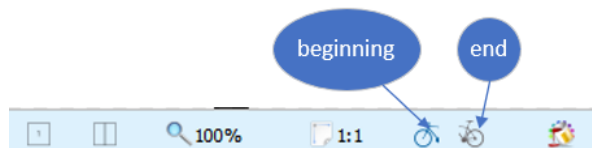
The marking is visual as a (semi-transparent) yellow marking at the top and bottom of the image and it is visible in the overview as well.



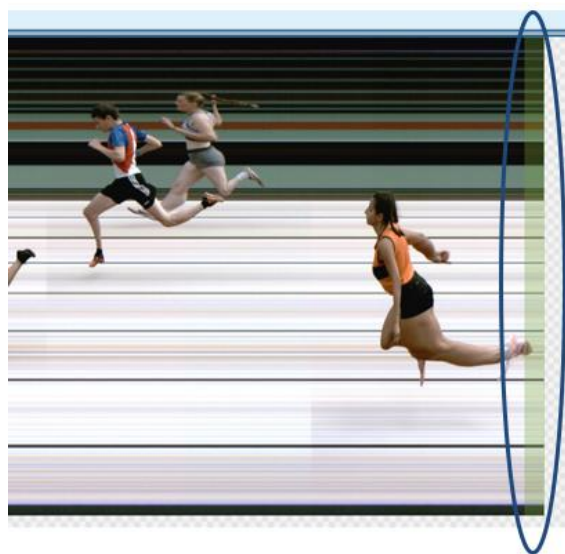
Automatically scroll to begin or end of the next finish

In some sports, it can come very handy if your photofinish image view is automatically scrolled to the beginning or end of the next arrival. We think of a points race in track cycling or inline skating, ... This can be achieved in Argus with the two small buttons to "arm for the next arrival" at the bottom of each active race. They change slightly in color if the race is "armed for the next

arrival” and when so, you’ll see that the photofinish image view will present you the beginning/end of the next arrival centralized on your screen, even if the arrival is a whole bunch or consecutive arrivals happen.



If you want to automatically scroll the image to the last portion recorded, you can do so by scrolling to the very last part of the image. The scrollbar is then glued to the end of the image. Note that the end of the image can be the left side or the right side, depending on the image direction. The end of the image is indicated with a transparent green block.



Missing arrivals – continuous recording (if supported by your license)

If you have a missing arrival, for example if you press the Stop icon too early or if an athlete falls across the finish line but under the arrival beam, it is possible to retrieve missing arrivals using the Argus Pro Continuous Recording feature.

To enable this feature, first the race that you wish to send missing arrivals to should be active and running/started. If you have already stopped the race, long left mouse click on the stop icon to get the race active again.

The Argus camera continuously records all lines from the previous 20 minutes (approximately). Therefore, if you have an issue with a missing arrival, you can go back in time up to 20 minutes and retrieve this data.

To access the continuous recording mode, click on the film roll icon to the top right of the screen. This will produce an additional window shown to the top of the photo finish section.



You can find the missing arrivals you need by using the scroll bar to view through the past 20 minutes of recordings. You are assisted by Argus if you scroll over a part in the already recorded photofinish image, the continuous recording view will scroll to the same point in time.


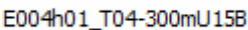

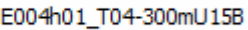

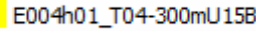

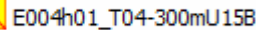

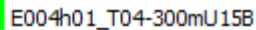

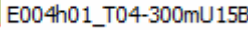

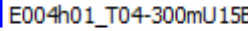

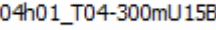
When you have found the missing arrivals frames you require, select them by left mouse clicking at the start of the frames, hold and drag until the last frames you need.

When you release your mouse button, you will get prompt 'Do you want to add the selected lines to the current race?'. Select 'Yes' and you will see that the missing arrivals now appear on your photo finish image. You will notice the area you have clicks and dragged is highlighted (the width of the area is limited, you might need to select multiple area's before you have downloaded all images you need).

To reload the continuous recording-view with the very latest images, you must hide it and re-show it.

Color indicators

In both the tabs and 'All My Races' section, when you double click on a race a coloured box will show to the left side of the race label. These indicate the various states in which the race is in.

-   **Grey Box** – this indicates that the race is unarmed (not ready to accept a start signal) and the arrival control is set to 'auto'.
-   **Grey Box & Cross Through** – this indicates that the race is unarmed and the arrival control is set to 'block'.
-   **Yellow Box** – this indicates that the race is armed, and the arrival control is set to 'auto'.
-   **Yellow Box & Cross Through** – this indicates that the race is armed and the arrival control is set to 'block'.
-   **Green Box** – this indicates that the race is active/running, and the arrival control is set to 'auto'.
-   **Green Box & Cross Through** – this indicates that the race is active/running and the arrival control is set to 'block'.
-   **Blue Box** – this indicates that an arrival has been detected and is about to write the image to the software.
-   **No Box** – this indicates that the active race has been stopped and no further actions can be performed to this race.

Multiple races at once

In Argus, it is possible to run multiple races at once. Important to manage this is to know which races are "armed-for-start" and for which race you have "blocked" arrival signals. The same

arrival signal can be used for multiple races and as a result the same image can be stored into multiple races at once.

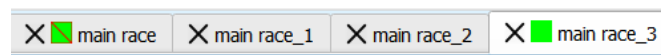
If you plan on using multiple races at once (e.g. BMX, rowing, ...) take a look again to the color codes from the previous chapter. They will help you to keep the overview of what is happening on the track and in Argus.

There is another extra feature worth mentioning when using multiple races at once: if you register a result in one race, this is indicated with a red line. But notice that in all other races, where the same part of the image is also recorded, the same result is indicated with a white dashed line. This helps you to see that a participant was racing in the previous race (because you registered the participant already there).

Child races

A special variant of multiple races, are child races. This can be used if you have one race but with intermediate scoring. We think for instance of a points race in inline skating or an elimination in track cycling.

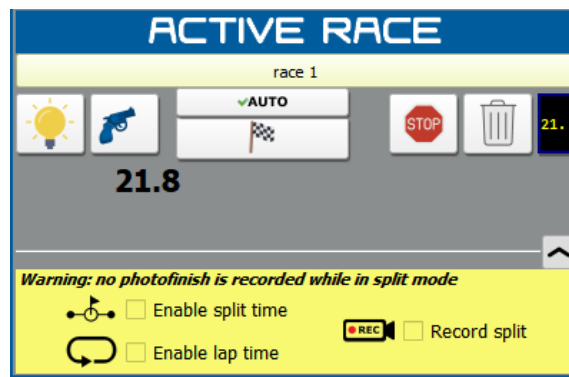
How can you use this: start with the main race. You can choose to block all arrivals in the main race until the last ones, until the finish. Or you can choose to record everything in the main race. Once the main race has started, you can create a new child race (for the first sprint or for the first elimination, ...) with SHIFT+F3. The child race will inherit the start signal from the main race. After the arrivals in the first race, you can start a second child race (for the second sprint or the second elimination, ...) with SHIFT+F3. This child race will inherit the start from the main race as well and by creating this new child race, the first one will be stopped automatically. You can continue to create child races. But don't forget to enable arrivals again in the main race before the final finish.



Split times and lap times

Split times and lap times are only relevant if you are using a scoreboard output. The difference between a split time and a lap time is that for a split time, the running time will pause for some seconds (this is a scoreboard-settings parameter), but for a lap time, Argus just sends the precise time and continues the running time immediately afterwards. Both split times and lap times are recorded via a hardware arrival signal.

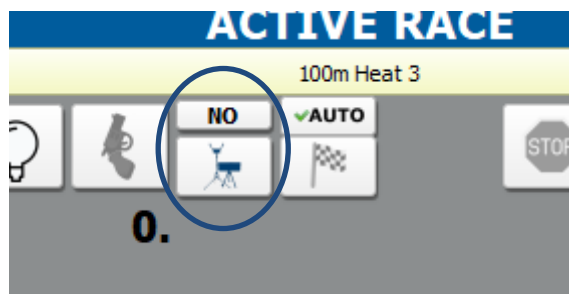
You can opt to record also the passages when the split time (or lap time) is recorded. If you don't record the passage, be aware to exit the split/lap-time-mode before an actual arrival or you might miss the recording.



Wind gauge (if applicable for your sport)

Wind measurements are a vital part of any sprint race, a 10.99 into a -3.0 m/s is very different to a 10.99 with a +3.0 m/s, therefore we need to know how to control the WindSpeed from the photo finish computer and change the different lengths of time the wind is measured for.

The WindSpeed controls can be found within the 'Active Race' controls of a race.

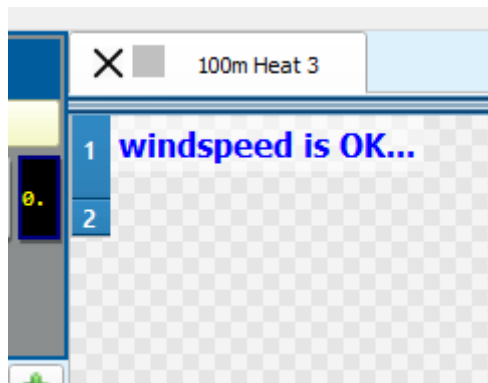


The top smaller button controls the time frame of which you wish the WindSpeed to measure after a race start has been detected. When clicked, this presents a drop-down menu for you to choose your required wind speed. The options are as follows:

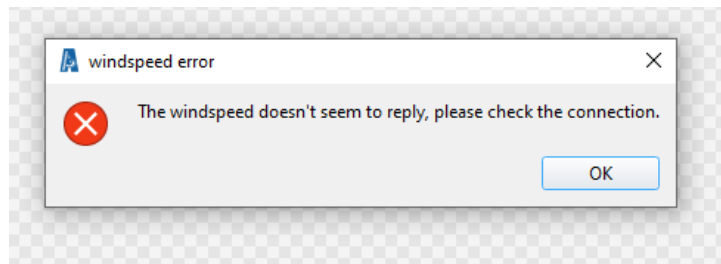
- No – No WindSpeed measurement (WindSpeed scoreboard will also be cleared)
- Man – WindSpeed will measure for 10 sec after the photo finish operator has pressed the manual windspeed recording icon (below the windspeed toggle icon). Used for 200m races whereby the performance of the athletes is anticipated to be above 21 sec.
- 10 – WindSpeed will measure for 10 sec after the start. Used for 75m – 100m flat races and 70m – 80m hurdle races
- 10* - WindSpeed will wait for 10 sec after the start and then proceed to measure the wind 10 sec after this point. Used for 200m races whereby the performance of the athletes is anticipated to be below 21 sec.
- 13 - WindSpeed will measure for 13 sec after the start. Used for 100m – 110m hurdle races
- 5 - WindSpeed will measure for 5 sec after the start. Used for outdoor 60m flat races.

You can use the WindSpeed drop down list when the software is in either idle or an armed state. If you change the WindSpeed measurement setting when the software is in an idle state, when you shift to an armed state, you will get confirmation that the WindSpeed is connected

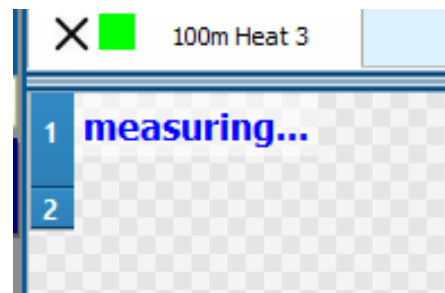
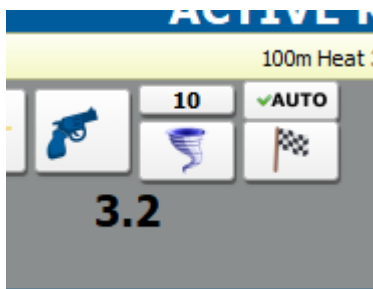
well and ready to start measuring as soon as a start is detected. This will be indicated by the fact that when you arm the system, it will continue to stay armed, and a 'windspeed is ok' message is displayed to the top left of the photo finish window.



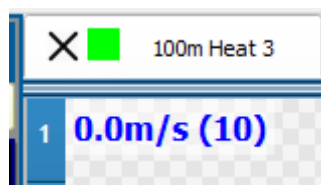
If the WindSpeed is not connected well, you will get a warning message 'The windspeed doesn't seem to reply, please check the connection.' and the software will revert to an idle /unarmed state.

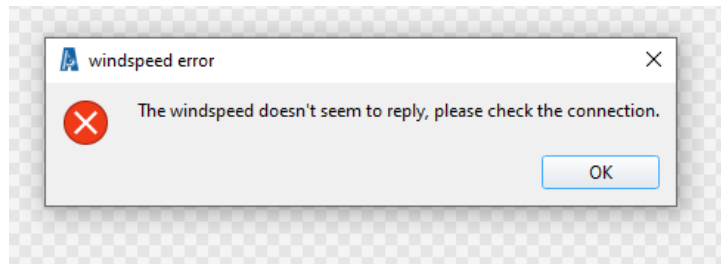


Upon the start of a race where you have indicated that you wish to record a WindSpeed for, the WindSpeed icon in the 'Active Race' will turn to a tornado and the message to the top left of the photo finish image section will change from 'windspeed is OK' to 'measuring...'.



As soon as the windspeed measurement has been complete, it will be displayed immediately to the top left of the photo finish image section, regardless of any arrival signals that have been recorded or not.





The software will memorize the WindSpeed selection you have chosen from the previous race. Or if you are using a synchronization method, some of those will automatically set the correct WindSpeed selection for you (e.g. Atletiek.nu, AthleticsManager, ...)

Race sounds

Sometimes a sound can draw your attention very effective. Therefore some statuses in Argus have been given a sound. There are sound indicators for:

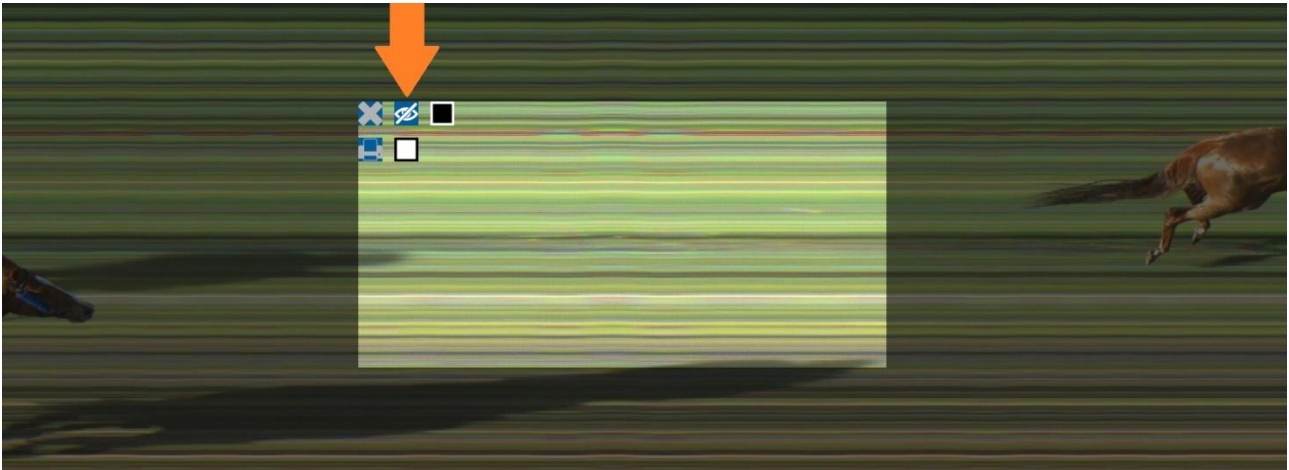
- the start of a race (bang of a gun)
- a start signal, but no race is armed-for-start (low frequency beep)
- an arrival signal (beep)
- a start detector is loose (constant ticking)

You can enable or disable any sound in the general settings.

Processing your photofinish image

Hiding frames

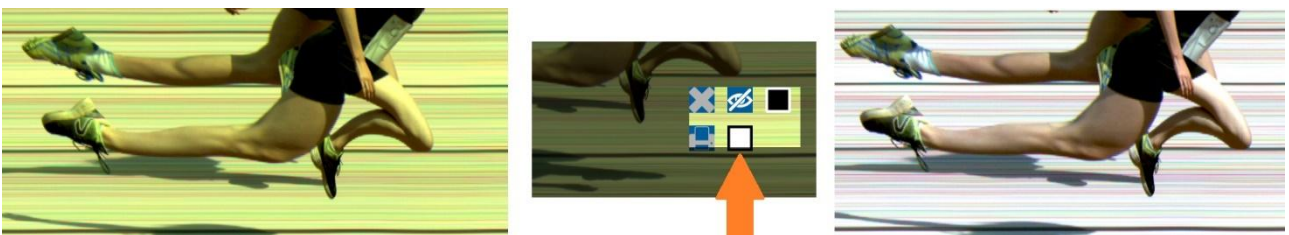
E.g. when you plan to export your image to a TV-screen or a webimage, it looks better if the background-lines in between two athletes are small enough. You can remove these background-parts by dragging a rectangle, click on the +-button and choose the hide-lines-option. Note that the lines are only hidden, they are never removed. You can always re-show them with the option "show all hidden frames" from the image info.



Colour balance

It is advised to control the colour balance mainly by the settings of the camera. But even if you want to make adjustments afterwards, you can do so by dragging a small rectangle on a black or a white area of your image (an area that should be black or should be white but is not) and select the option to adjust the black-level or the white-balance according to this area.

Again use the +-button to make the options available. In the example below, we used the white-balance button on a white finishline area in athletics.



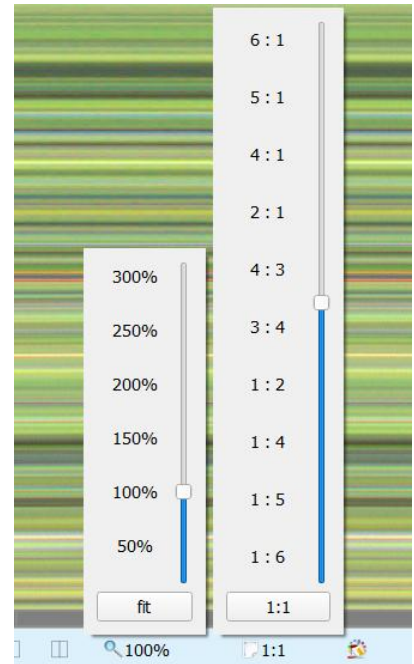
Zoom and scroll

The obvious access to zoom controls is at the bottom of each photofinish image. With the button [100%] you can zoom-in and zoom-out. With the button [1:1] you can control the aspect ratio. An aspect ratio of 1:3 makes the passing object horizontally longer, so this could be used for a more natural view on very fast passing objects. An aspect ration of 3:1 does the opposite.

At the bottom of the zoom-button, you can find a [fit]-button, this will find the best zoom-scale in order to fill the maximum of the available screen. In the aspect ratio menu, you have a button to reset to the initial aspect ratio of [1:1].

Besides this menu, it is also possible to zoom using CTRL+mouse wheel. The position of your cursor defines the center-point of the zooming. With only your keyboard, you can use CTRL++ to zoom-in one level, CTRL+- to zoom-out and CTRL+0 to reset the zoom-level to the best-fit.

Scrolling through the image can of course be done with the scrollbar, but again, some handy tricks have been integrated in Argus. Remember that your mouse-wheel can scroll up-down an image. If you hold SHIFT while you scroll the mouse-wheel, you scroll left-right. And if you right-click in the image, you can grab that anchor-point and move your mouse to scroll (so right-click – hold that – move the mouse). If you need to zoom-in to details to solve a tie, there is another option. It is called “image-eye-zoom” and will be discussed later in the chapter on registering results.



Scroll with the overview (if supported by your license)

The complete photofinish image is repeated downscaled at the top of your screen. You can select a part of the image in the overview and that results in scrolling to that part in the main photofinish view. You can open/close the overview with CTRL+O or the buttons indicated in the screenshot below.

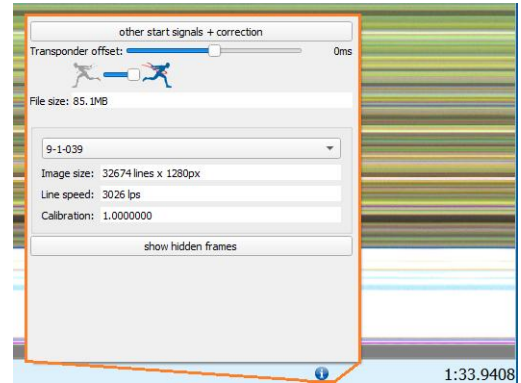


Time resolution

At the bottom-right corner of the photofinish image, you see an indication of the time at the position of the cursor. If you want to change the resolution of this time, just click it and it will browse through 1s, 0.1s, 0.01s, 0.001s and 0.0001s.

Image info

There is an image-info-button in each photofinish image. In the image-info popup, you'll find access to all start signals (if multiple have been registered), the function to reshown hidden lines (if any), the option to change the image direction and some general info of the image and the camera used.



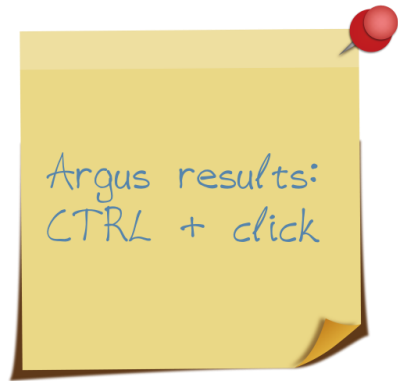
Register results

You now know how to configure your camera to record quality-photo finish images, now we will explain how to use the image and register the results.

The base thing to know is that in Argus, you use CTRL+click to register a result. As an alternative, you can long-press the same vertical line.

Right after you CTRL+clicked to register a result, you can use CTRL+arrow-keys to move the result line one pixel at a time. If you want to move a result line later, you first select the result from the results table and again use CTRL+arrow-keys to move it one pixel at a time.

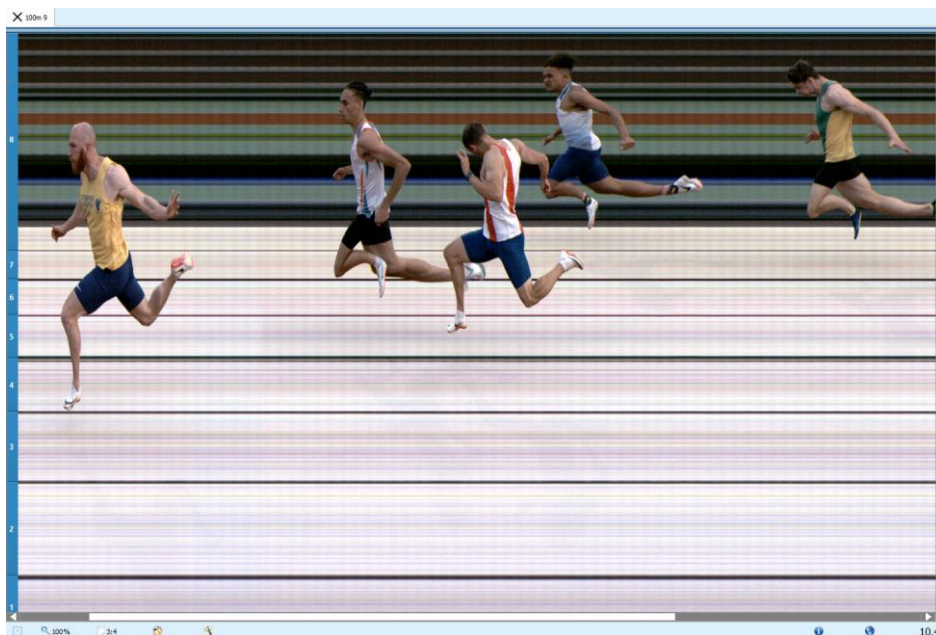
If you want to delete a result line, click the corresponding result in the table and press <delete>.



Enter results by lane

In some sports, e.g. athletics, rowing, ... (some) events are held in lanes. You can use the lane to identify the athlete. It is significantly more effective to use the lane identification.

Here we will explore how to utilise the lane identification method. In the following image, you will see a 100m race with 5 finishing participants.

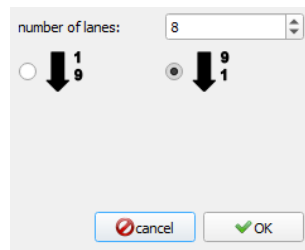


Each one is finishing in their own lane, and therefore we can identify the athlete by which lane they are in. In the image above, the athletes are in the following lanes reading from left to right: lane 3, 5, 4, 8 & 7. It can sometimes be hard to tell what lane an athlete is in, depending on the camera angle and the position of athlete across the line. This is something you need to practice, and we recommend photo finish operators gain experience and be proficient with reading

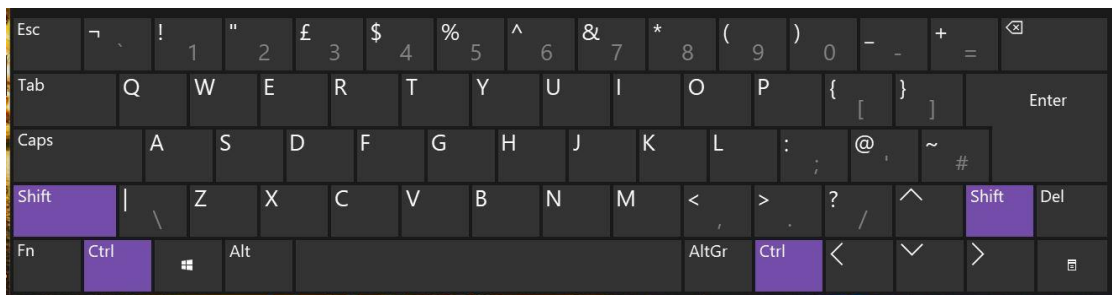
previous photo finish images before reading live ones. Please contact your local supplier or TimeTronics who will be able to assist in providing these files. When you get the hang of it, reading races by lanes becomes super easy and super quick!

Of course in order to use the division of the image in lanes, we first have to set this lane markers. This is done in the scrolling preview window. Grap the marker in between two lanes and drag it to the correct place. Once you defined the borders of each lane in the scrolling preview, these will be reflected in every consecutive image you record.

By default Argus will display 8 lanes with lane 1 at the top of the image. If your track has less or more lanes or if your camera is on the inside and lane 1 is at the bottom, you can change this by double-clicking the lanes header. The popup below will be shown.

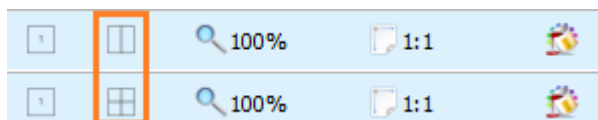


To register results from a photofinish image by lanes, hover the cursor over the photo finish image in any place, you will notice that you have a vertical line in relation to your mouse position. Press and hold the CTRL+Shift key on your keyboard and you will see that as well as the vertical line, you now have a horizontal line.



Line up the vertical line with the torso of the athlete that you wish to obtain a time for and then move the horizontal line so that it is within the lane (in relation to your lane markers that you have set up) that the athlete is in. When you have the cursor in the correct position, whilst still holding CTRL+Shift, left click on the mouse to obtain the time and the athlete identification for that time. You will notice a result appear in your results table and a red time line is shown on your image. Repeat this process for every athlete within the image.

If you wish to use this way of reading images for your entire competition, you can press CTRL+double tap Shift. You will now see a permanent horizontal line and will only need to press the CTRL+click to produce a result with time and lane. To remove the horizontal line, press Shift again. Locking the horizontal cursor line can also be achieved by toggling this button at the bottom of the photofinish image.

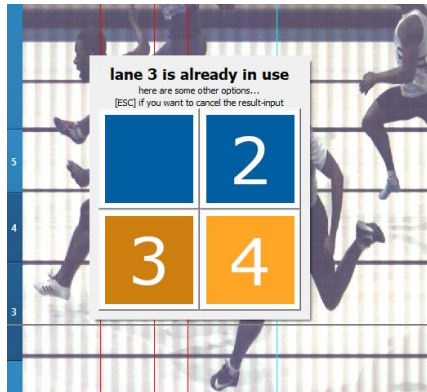


N.B. Cursor on the example image is depicted as a red line for visual assistance within this guide, you will have a thin black line showing on your screen.

Some operators find it handy to first define the order of the athletes lane-by-lane and then register the result times. This is also possible, CTRL+click on the lane header in the order the athletes arrived, you'll notice that results are put into the table, but no timings yet. Then put the cursor in the time-column of the first result and start CTRL+clicking to input the times from the first to the last athlete.

Warnings double use of the same line

If you register the same lane twice, you probably made a mistake. Argus will ask you to change the lane for the result you entered. In the options, the color of the lane reflects if it is already in use (orange) or not (blue). In the example below, we entered a new result in lane 3 while it was already in use. Lane 2 is still open, lane 4 is also already in use. The empty option is "register the time, but don't match it with any lane yet".

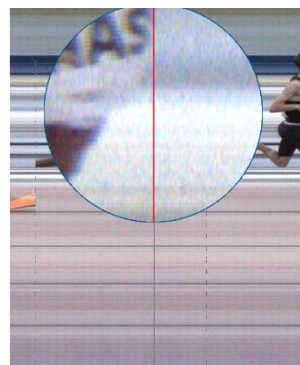


After selecting one of the options, only the newly registered result can be altered. If we e.g. selected option "3" in the previous example, we will end up with two results for lane 3. You'll see in the results table that the background of double-used lanes is colored orange. If you want to solve the double-use, click on the lane number you want to change and CTRL+click on the lane header you want to change it to.

RESULTS TABLE						
rank	lane	time	name	extra1	extra2	extra3
1	3	6.74				
2	4	6.77				
3	1	6.79				
4	3	6.85				


Special method to enter a result: hold the mouse button down

Another way to record a result in Argus is by clicking near the point in the image where the athlete crosses the finish line. If you hold the left mouse button steady for half a second, a magnifying glass will appear. You can then adjust the mouse position so that the red line within the magnifier precisely aligns with the line where the athlete passes the finish line. If you move too far from the initial click point, the magnifying glass will disappear automatically. Releasing the mouse button at this point will register the result for that moment in the race.



Note that if the zoomfactor is over 150% (horizontal zoom), there is no need for the magnifying glass and only the red line is shown in Argus. You can move the red line while you hold the mouse button down.

Note also that you need to click somewhere near (in time, not necessarily vertically) the target result. If you move the magnifying glass too far from the original click-point, it will automatically disappear.

And a final note: for races in lanes (e.g. athletics), you can enable the lane-cross (with double-click on shift or this button: ). The point where you first click to show the magnifying glass, will define the lane for the result.

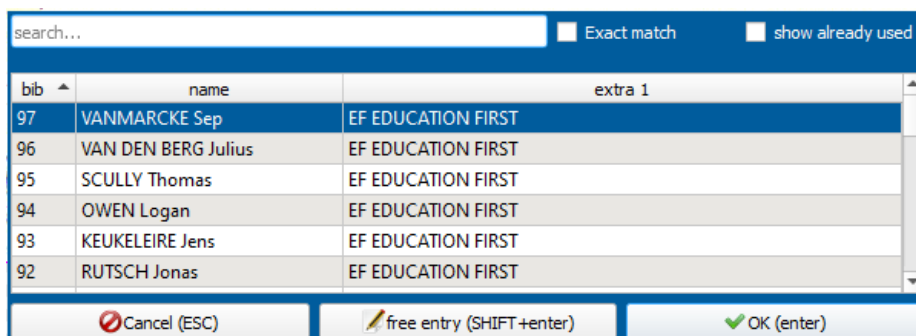
The magnifying glass is a software option in your license key. If you have the option "Image Eye Zoom" enabled, you can use this handy feature.

Enter results by ID or name

After you enter a result, you can type in the ID of the participant. This is when you have no synchronization with any result management system.

If you have a synchronization method enabled (later more on the options and how to use them), you have a list of participants already in the photofinish image. It is a matter of selecting the correct one.

After registering a result, you are presented with this kind of popup-window (it might vary a bit depending on the sport you selected).



You can start typing and the list will be filtered by name, team, ... all data that is available. If you press <enter>, the selected athlete (by default the first in the list) will be used to match the registered result.

At the top, you can choose for an option to filter only by an exact match (might be useful when you know you'll always enter the full BIB of the athlete) or to show/hide the athletes you already registered.

With a right-click on the column header, you can show/hide the columns you want. With a click on a column header, the list will be sorted on that column (click again to change the sort direction). You can also drag a column header to change the order of the columns. This behaviour is the same in all tables in Argus.

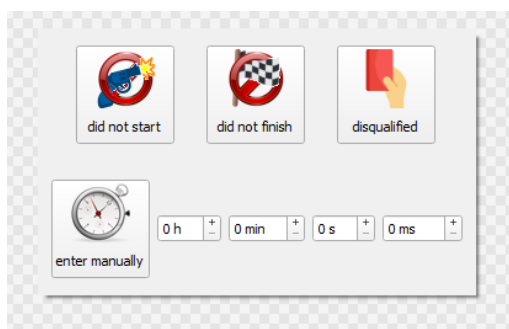
Enter results by transponder

In the same popup window you see when entering results by ID or name, you can show a column "transponder offset" if you have an active integration with a transponder system. If you show

that column and you sort by smallest "transponder offset" first, automatically the athlete with a transponder passage closest to the registered result, will appear first in the table.

Enter coded results (DNS/DQ/...)

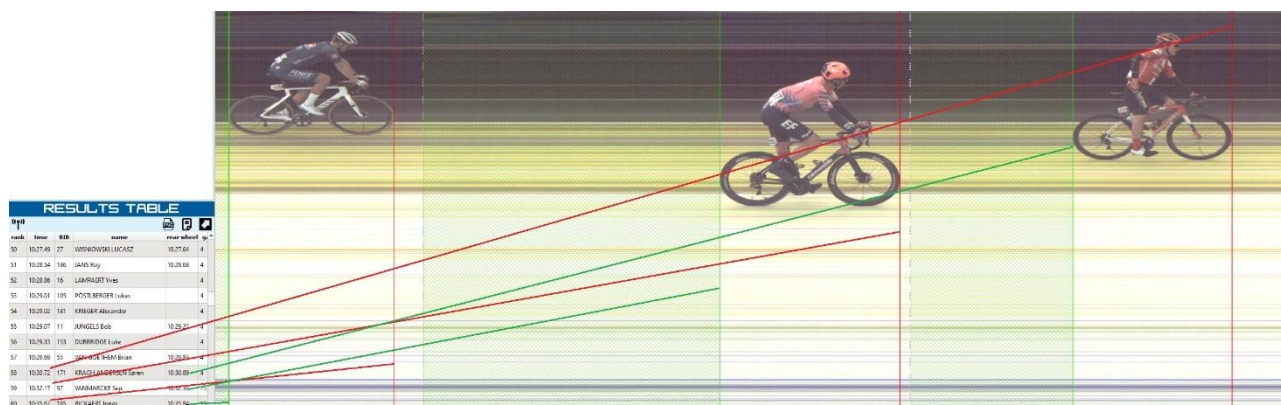
Sometimes you have to register special results (not times) for an athlete, e.g. a disqualification, a did-not-start, ... This is done in Argus by CTRL+click the time-column of that athlete in the results table. You are presented with a list of options to choose from. In the example below, you see the general list of options, however it can vary on the sport you have selected in the general settings of Argus.



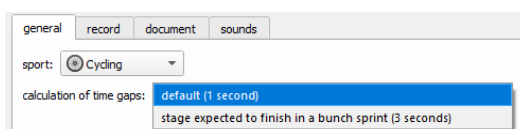
Gaps for cycling

In road cycling, the gap between the end of the back-wheel and the front of the first wheel of the next cyclist, is important. If this gap exceeds 1s/3s, then all next cyclists will get the result of the first one of the bunch until there is a next gap of 1s/3s or longer.

For this, you need to be able to register the time of the back-wheel of a cyclist. In Argus you can do so with CTRL+right-click. On the image, you'll see a green raster appear to indicate the minimum gap before the result-time will jump.



If Argus calculates with a minimum gap of 1 or 3 seconds, can be set in the general settings, in the section Sport/Cycling.



New results are automatically broadcasted

If you register a new result, that is automatically broadcasted in the background. If you are using a client that listens to this broadcast, it will receive it. E.g. if you use TimeTronics' ViewManager, this will immediately display a new result at the moment you click on the image and select the athlete.

This is a nice feature for your spectators, but sometimes, you want to register the results not from first to last, e.g. if you see there is a close tie for position 2, you skip places 2 and 3 and continue with position 4. You don't want these results to be broadcasted yet, so you want to pause the broadcasting of new results. This is done with the button on the top-left of the results table. Once you have solved the tie and you want to continue broadcasting, re-enable it and all pending results will be broadcasted in the correct order.

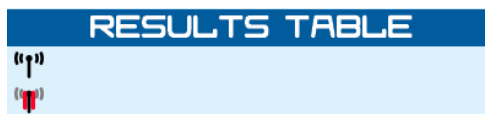


Image-eye zoom

During the reading of a race, it is likely that you will encounter two or more athletes that are very close together.

The Image Eye Zoom function gives the user a quick way to magnify a certain part of the image. Hover your cursor over a part of the photo finish image. Now press and hold Alt on your keyboard and you will notice to the right of your image a magnification appears of the portion of the image that your cursor is on. The magnified area is depicted by the rectangular box which now sits on your vertical cursor line. Whilst continuing to hold CTRL+Alt, you can move your cursor to any part of the image to see the magnification.

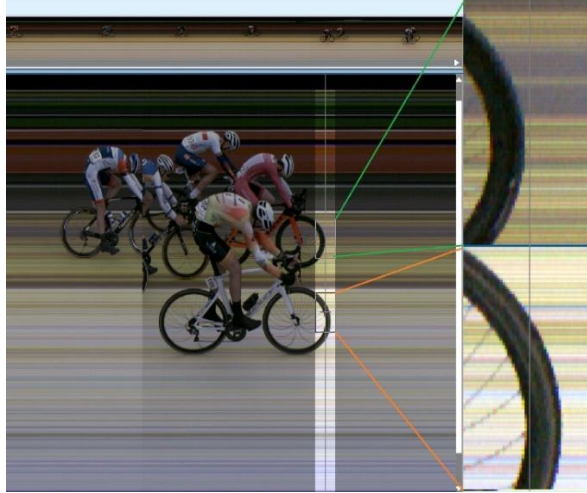
If you double click on Alt then the Image Eye Zoom will permanently be visible, when click Alt again and it will change back to normal view.



You can zoom-in and zoom-out in the Image Eye with the mouse wheel.

If the tie is between a participant at the top of your image and one at the bottom, you can not zoom into both athletes at once. Therefore, the Image Eye view can split. If you open the

Image Eye, point to the first object of interest (make sure it is visible in the top half of the Image Eye), then click. Now you can only move your cursor vertically, the horizontal position is locked. You can now point to the second object of interest and its zoomed-in view will appear in the bottom half of the Image Eye.

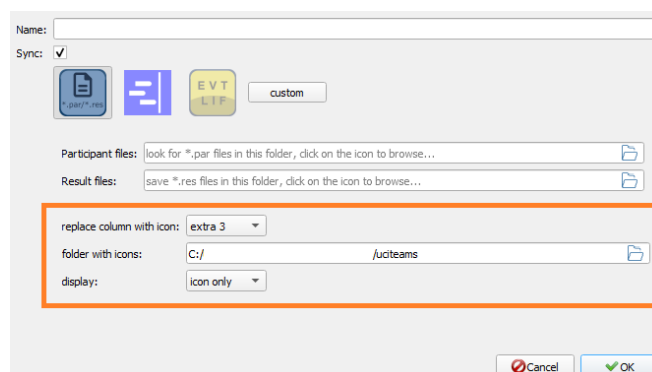


Icons in the participants table

A nice feature, especially helpful when athletes wear a club- or team-jersey, e.g. in athletics or cycling, or when a jockey wears unique colours or a dog wears a coloured jersey, is the possibility in Argus to show these as a visual aid to identify the athlete.

The first task is to collect all icons. You need to store them as *.png's locally on your Argus-computer. It is important that the name of the image matches a data-field you receive with the synchronization method.

The setting where the images are stored and which datafield must be replaced with the image, is also found in the synchronization-settings of the folder (later more on this).



In the screenshot above, we define that if we receive a rider from the synchronization with in the datafield "extra 3" the value MOV, we will replace the value in the column "extra 3" with the icon MOV.png from the folder C:\...\uciteams.

RESULTS TABLE

rank	time	extra3	name	gap
16	10:21.50		DRUCKER Jean-Pierre	4
17	10:21.55		TOUZE Damien	4
18	10:21.55		DEGENKOLB John	4
19	10:21.61		ARANBURU DEBA Alexander	4
20	10:21.62		VENTURINI Clément	4
21	10:21.64		ALLEGAERT Piet	4
22	10:21.72		PASQUALON Andrea	4
23	10:21.78		NAESEN Olivier	4
24	10:21.91		JORGENSEN Connor	4

UAE Exact match show already used

bib	name	extra 3	extra 1
82	BOHLI Tom		UAE Team Emirates
83	BJERG Mikkel		UAE Team Emirates
85	LAENGEN Vegard Stake		UAE Team Emirates
86	MARCATO Marco		UAE Team Emirates

TimeTronics
Argus

100% 1:1

RESULTS TABLE

rank	time	extra1	name
			DE KEYSER EMMA
			WILLEMS LOTTE
			HERMANS MOIRA
			DE BOCK MARIE
			DAELMAN DEMI
			MERTENS HASSE
			VANBUJGGENHOUT MARLIKE
			QUATACKER LOTTE
			CORNELIS JACINTHA

Search... Exact match show already used

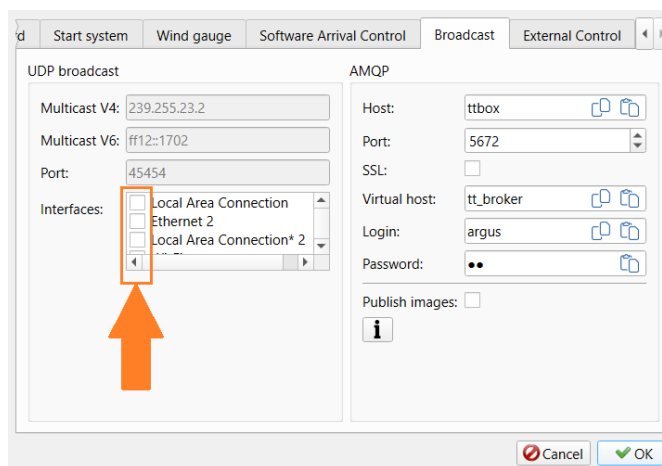
bib	extra 1	name
2897		WILLEMS LOTTE
253		DE BOCK MARIE
1430		CORNELIS JACINTHA
1402		DAWYNDT AMBER

Outputs

Continuous and automatic output

All that happens in Argus, is automatically broadcasted. Other TimeTronics' software and hardware solutions take advantage of this broadcast. E.g. if you want to display event info to your spectators, with TimeTronics' ViewManager automatically displaying participants before the start of a race, the running and finish times during a race and immediately show the results after a race, is piece of cake. No operator interaction is needed for this. More info on this is available on request (info@timetronics.be).

If you like to disable the broadcasted info on some network interfaces (e.g. you have a metered network connection), you can from the Broadcast-settings.



In this settings-window, you also find parameters to make Argus a AMQP-Publisher. Click on the info-button for more detailed information.

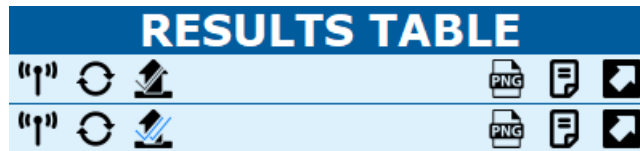
Upload results to a synchronization interface (if supported by your license)

If you have a synchronization method enabled and that synchronization method can receive photofinish results, you'll notice markings in the list of races to indicate that results have been added are updated and you have not uploaded them to the synchronisation interface.

In the screenshot below, you see the grey single markings to indicate that there are pending results that have not been uploaded. The blueish double marking indicate that the results have been uploaded. The same markings are repeated on the upload-button in the header of the results table.

Note that the times in the table are the time-scheduled of the race and the effective time of the start signal of the race.

double click for a new race (F3)		
100 SF-1-SEN H	15:00	15:33 ✓
100 SF-2-SEN H	15:02	15:39 ✓✓
200-1-SEN D	15:15	



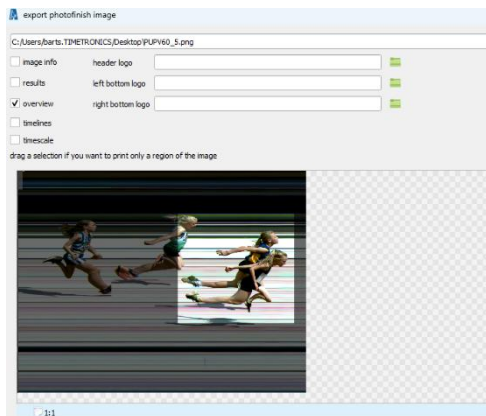
Export your image to a standard image format (png/jpg)

In the header of the results table, you find a PNG-button (third from the right). With this button, you open a popup window where you can:



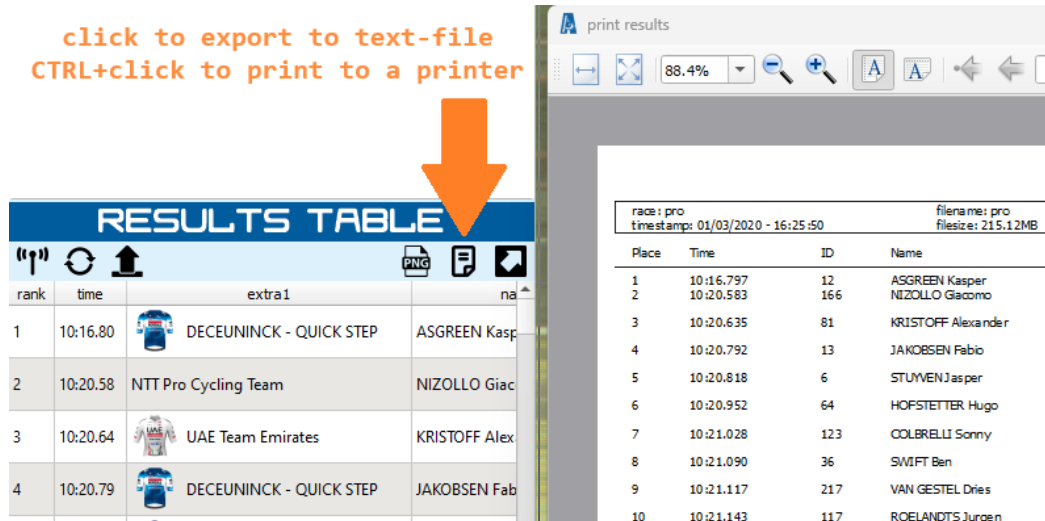
- Select an area on the image to export (select no area for a complete export), selecting the area is done by dragging the mouse.
- Select optional logo's/header-images to be displayed on top or in the bottom corners of the exported image.
- Select optionally if these extra information must be printed on the image
 - o The info of the recording (camera, calibration value, title, ...)
 - o A table with the results
 - o The overview (if you select one detail to be exported, it is often desired to have the complete image on top of it, but in less detailed resolution)
 - o The timelines to show where you placed the result-markers.
 - o The timescale to show the exact timing even outside of the photofinish software.

In the screenshot below, you see the selection we made and left of that, the resulting export.



Print results

You can print the results to a plain text file or a simple printout of the results to a printer with the middle button on the right side of the results table header. A click opens a popup to select the text file to print to, a CTRL+click opens a print-preview window where you can select the printer and the number of copies.



Presentation mode

If you need to display the photofinish image on an external screen, or make it available on HDMI to be used by video broadcasting, you can show the photofinish image in "presentation mode". This is the button with the image of a screen, next to the timing, on the right-bottom corner of each photofinish image. If you click this and you have multiple display-outputs, the first question you are asked is on which display to show the presentation-view of the image.



You have the option to display a custom logo and display or hide the result lines as often you don't want to ignite discussions to display these.

If you have selected the display to show the presentation mode on, the same portion of the image in-view on your screen, will be displayed full-screen on the selected display. You can close the presentation mode with a push on the [Escape]-button.

If you want to scroll inside the presentation mode, you can use right-click and drag, or use the arrow-keys to move the image. And to zoom, CTRL+mouse wheel is also available in the presentation mode.

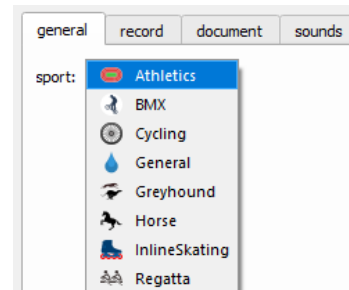
General settings

Here we'll discuss the general settings of Argus. You can find these with the bottom-button in the right menu bar.

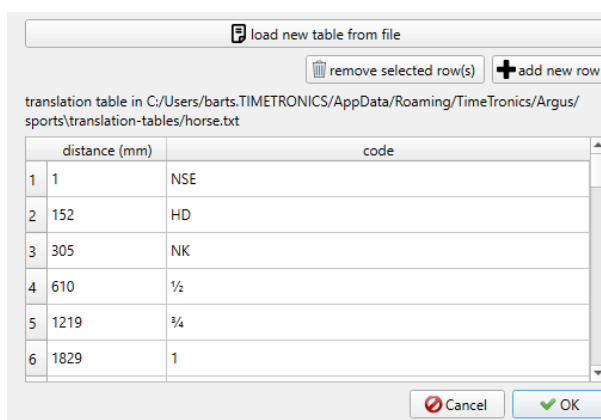
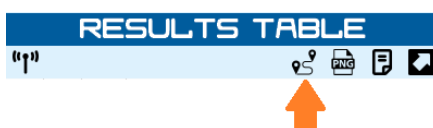


Sport dependent settings

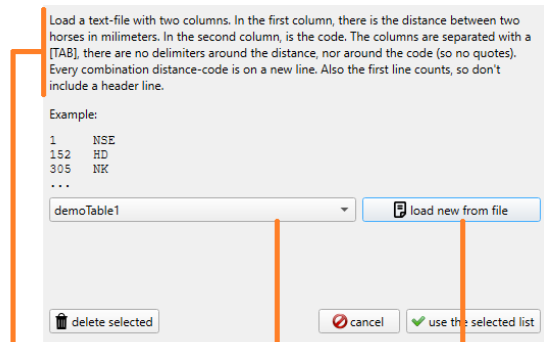
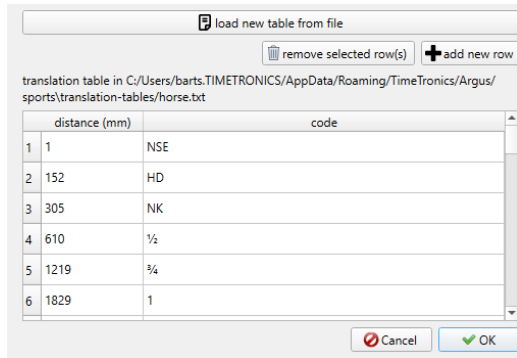
The first tab in the settings gives you a list of available sports. Some behaviour, some user interface varies slightly depending on the sport you use Argus for. Some sport-specific settings are:



- Default rounding and precision of the results (e.g. round up to 0.01s for athletics, round to the nearest 0.001s for inline skating).
- Are races held in lanes and must the lanes interface be visible (athletics and regatta)?
- Which synchronization methods are available (Atletiek.nu is only available for athletics).
- Do you need secondary results (back-wheel for cycling, split times for greyhound).
- Do you need a translation table to translate "the time-gap with the first" to a code (e.g. greyhound) or the distance-gap (based on average speed) with the previous to a code (e.g. horse racing to display "nose", "head", ...) If a translation table like this is needed, there is also an extra option in the header of the results table to define the distance of a race. And you can edit the translation-table if it is applicable for the selected sport. In the screenshot, you see an example of a translation-table for horse-races where the distance to the previous horse is translated into a distance-code. With the distance of the race and the finish-time of the first horse, the average speed is calculated. With that average speed, the time-gap to the previous horse is calculated to a distance-measurement and that distance-measurement is translated to a code with this table.



If you want to load your own custom translation table, this is possible as well. Follow the instructions in the screenshots below.



carefully read these instructions
select the translation table you want to use from this list
you can load your own translation table with this button

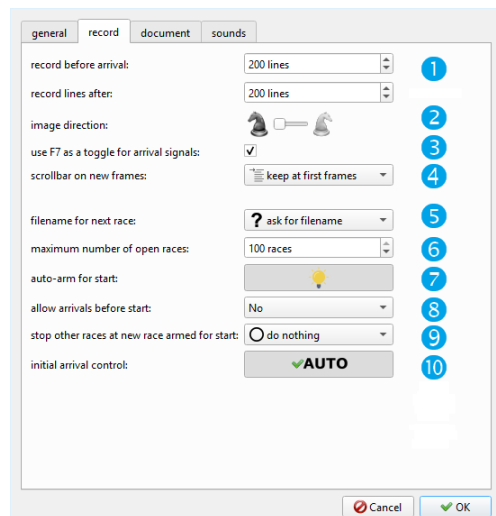
There is even an option to display kilometer times for trot-races. It also takes the penalty distance some horses have to run into account. These extra distance is automatically read when using the *SwissTiming-integration*.

rank	BIB	name	time	extra	horse	km time
1	9	SOLAS, A. SUBIAS	1:19.62	0		1:12.4
2	4	THE SHARK, A. BARON	1:19.66	75	½	1:07.8
3	2	WELLINGTON PREM, J. MOUTARD	1:20.08	25	2 ½	1:11.2
4	11	FICTION, L. ROUSSEL	1:20.32	0	1 ½	1:13.0
5	1	DALENDIA, D. PROVOST	1:20.76	25	2 ½	1:11.8
6	6	PEARL WOOD, M. BERTO	1:21.40	0	4	1:14.0
7	10	REDIA FAL, H. LEBOUIC	1:21.66	0	1 ½	1:14.2
8	5	MOON OF THE NIG, L. ROUSSEAU	1:23.21	0	9	1:15.6
9	7	MADEMOISELLE BE, Y. ROUSSET	1:23.38	0	1	1:15.8

1100 meter in 1:19.62 >> 1:12.38 over 1km
1175 meter in 1:19.66 >> 1:07.80 over 1km
1125 meter in 1:20.08 >> 1:11.18 over 1km
1100 meter in 1:20.32 >> 1:13.02 over 1km

Record

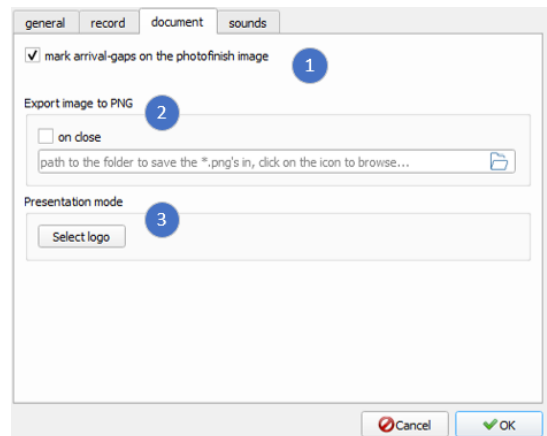
1. Define the number of lines that Argus will record before the beginning of the arrival signal and after the arrival signal stopped. Especially when you are using motion detection as the source of an arrival, use enough lines before the arrival is detected.
2. The default image direction. It can be altered in each image individually, but if you set this default setting, you probably want need to alter the image direction for any individual image.
3. Define the behaviour of the F7-key. The default behaviour (checked OFF) is that an arrival is recorded while you press the F7-key. You can change this (checked ON) so that the arrival starts when you press F7 the first time and it ends when you press F7 again.
4. What to do when you record lines of a new arrival, by default scroll with the last frames or keep the first arrival in view. More advanced control of this behaviour is explained in the section about "arm-for-next-arrival"
5. When not using a synchronization method, but creating new races manually, ask for a file name each time, or just use the next incremental number.



6. To keep your working instance of Argus clean, you can automatically close files if you have more than a given number of files opened. The file that has been opened the longest time ago, will be closed first. Files that are still active (not started yet or not stopped yet) will never be closed automatically.
7. When opening a new race, automatically arm-for-start or not?
8. Do you want to record arrivals before we even registered a start signal or not?
9. If you open a new race, do you want to stop automatically the active races to prevent that you record new arrivals also in the older race (remember you can record multiple races simultaneously)?
10. What is the initial state for software-arrival-control? Do you want to allow arrivals by default (recommended) or do you want to block arrivals by default and the operator has to allow recordings before the first arrival of each race?

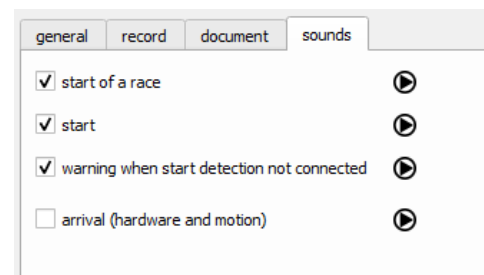
Document

1. Here you can show or hide the dashed lines shown in between separate arrival blocks in the photofinish image.
2. You can opt to let Argus automatically export each photofinish image to a PNG when you close it. This can be handy if you want to mirror these exported images to a webfeed.
3. The custom logo we talked about in the chapter on the presentation mode, can be selected here.



Sounds

Here you can switch on/off and test the different audio-signals Argus uses to indicate start signals and arrivals.



Other devices

Argus can work together with a variety of other devices. Settings for these connections can be found here, the other button at the bottom of the right menu-bar.



Transponders

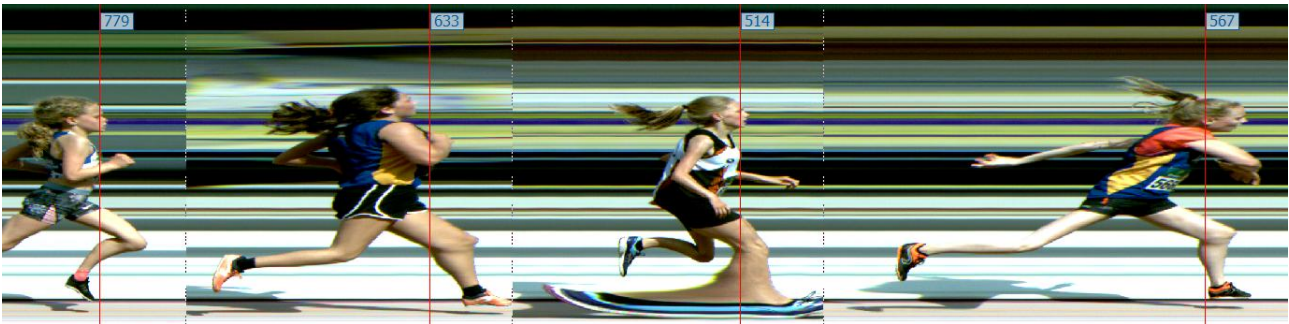
Argus has an integration with MYLAPS X2 and Smart Decoder, Portable Decoder and TableTop Decorer-systems and with RaceResult ActivePRO. The connection with the devices is as simple as defining the IP and port of the transponder system, define the name/number of the loop on the finish and define the number/marker of the start input. Note that for MYLAPS X2 Server, you'll need TimeTronics' MYLAPS SDK Wrapper, please ask more info on info@timetronics.be.

Extra settings for the interface in Argus are:

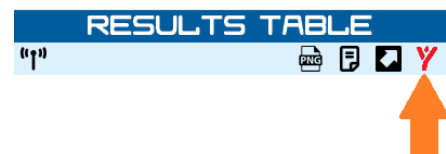
1. What to display in the transponder overlay, the bib, the transponder number, ... You can also limit the number of characters in the overlay to prevent too many overlapping texts. Argus will display overlapping texts on another line, but still it can be useful to limit the number of characters if you have long names.
2. Display the number of passages or not. This can come handy to filter-out lapped athletes.
3. Auto-offset for first result: when you switch this on, Argus will calculate an offset between the transponder passage of the winning athlete and its result line. This offset will then be used in the calculation of the position of all consecutive transponder passages. This way you make an automatic synchronization with the first result. Transponder passages are often detected a small distance after the finish line, while photofinish is of course straight on the finish line.
4. Minimum lap time: this is to filter-out double transponder passages.
5. Arrival by transponder passage: as a transponder passage is also an indication of an arrival, you could use it as an arrival signal. Note that you are fully depending on the correct detection of your transponder system if you use this feature (with the safety-line

of the continuous recording of Argus). As the transponder passage can only indicate the start of the arrival, you also need the setting to define the duration of the arrival.

The overlay of transponder passages (here we show the BIB number) looks like this:



In the header of the results table, you have an extra button that opens a popup with all transponder passages. You can search in this to look e.g. for the number of laps an athlete has completed.



In the section of reading out results, we already explained how to sort the options Argus suggest to identify an athlete by the closest-transponder passage.

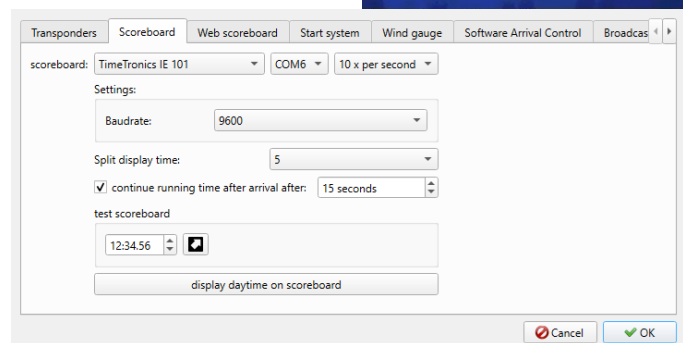
During a race, all transponder passages will be displayed in the camera-status area, at the bottom-left of the Argus window, next to the TimeTronics-logo.

Scoreboard

This is used to directly drive a scoreboard from Argus. You can as well use middleware using the continuous data broadcast from Argus. TimeTronics' ViewManager is the most common middleware for this. But for smaller setups, there is also a direct output to drive one scoreboard.



Argus has several drivers available. Depending on the scoreboard, you can select to drive it one time pre second or for more modern scoreboards, ten times a second. Other options or the hardware channel to send it to, a COM-port (baudrate is an optional setting) or a TCP-port (IP and port are optional settings).

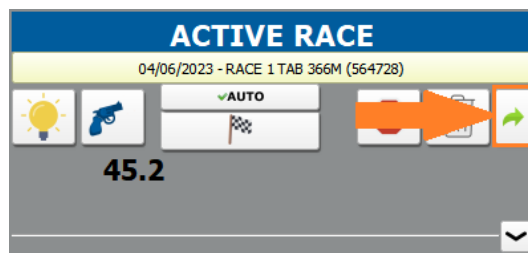


Two behaviour-settings are the time a split time will remain on the scoreboard and if you want to continue the running time after the first athlete has arrived (typically for long distance races, you want this to be displayed, for sprints it has no added value).

Beneath the settings, you find a small test-feature. You can set a running-time and send it to the scoreboard. This is useful to test the hardware connection between Argus and the

scoreboard. And at the bottom of the screen is a button to start displaying the daytime on the scoreboard. This is useful if there is a break in the program and you don't want the scoreboards to remain blank (or show the last finish time) during the break. Once a new race is armed, the daytime-mode automatically switches off or you can switch it off yourself with another click on the button. *Note: you must have confirmed the scoreboard protocol and serial port settings before the daytime will be displayed on the scoreboard (click OK).*

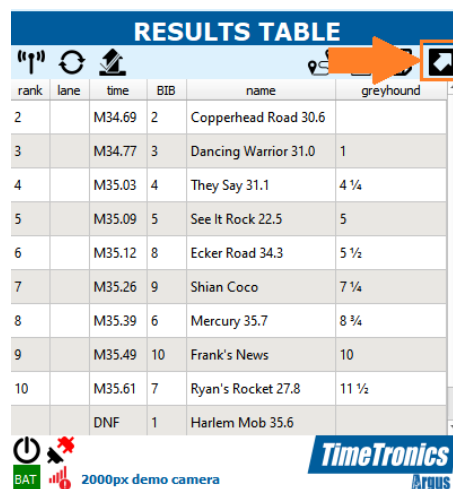
In case of multiple races simultaneously, the info of only one race will be displayed on the scoreboard. This is indicated in the race control window. If the right-most button (right of the trash can) is showing the running time, this race is displayed on the scoreboard. If not, it will display a green arrow. By clicking that green arrow, you mark this race to be displayed on the scoreboard.



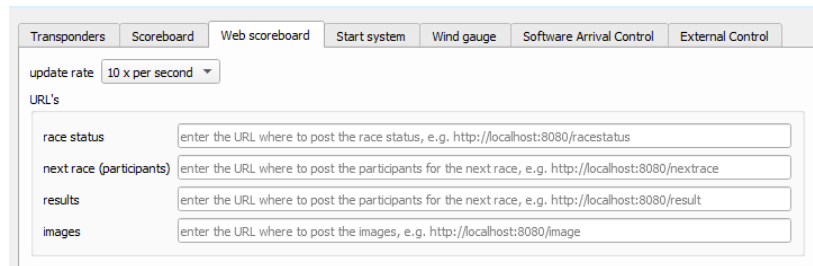
Web scoreboard

Argus can make data available through API-calls to a webserver. The webserver needs four endpoints:

- Race status: the status of the one race (not all in case of multiple races) that would have been send to a scoreboard, will be posted to this endpoint. You can see if the race has started yet, if the race is running, if windspeed was measured, if any athlete has arrived, the time of the last athlete that has arrived, ...
- Nextrace: when you open an idle race, this race is posted as the next race. If the race has participants loaded from a synchronization method, these are included in the post message. This message can be used to display a participants list prior to the start of the race.
- Results: with every registration of a result (with every CTRL+click), the result is posted immediately to the web scoreboard. All other results are included as well as it is possible that the new result has an influence on previously registered results, e.g. the rank of the first one will increment to 2 if your second result is better than the first. At the end, it is possible to send all results again to the web scoreboard with the button in the heading of the results table indicated in the screenshot on the right. There is an unofficial/official marking to differentiate both events (CTRL+click vs. send-all-results).



- Image: there are two types of images that can be posted, the complete image and a detailed image. The complete image is posted every time you click on the button to post all results. The detailed image is posted when you manually create it using the PNG-button in the heading of the results table. A popup is shown where you can select additional logo's and other options. When you save the image, automatically it is also posted to the web scoreboard.



Detailed info on the format of the post-messages and a demo server-application can be provided on request (info@timetronics.be).

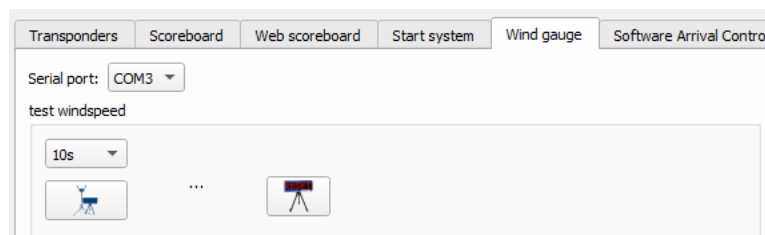
Start system

Argus can connect with several wireless start systems. Note that you first need to connect your camera before you can select the wireless start system to use.

Wind gauge

Argus can work with all TimeTronics Wind gauges. The only thing you need to configure is the number of the serial port to use.

At the bottom of this window, you find a section to test the Wind gauge (test especially the hardware connection) and to reset the windspeed scoreboard (especially after your tests or after a false start detection and there is a result being displayed).



Software arrival control

TimeTronics has a hardware arrival control for when you are close to the interface box. This is a true hardware input in the camera. But there is also a software variant that can be connected to your computer through USB. This is easier in use when your camera and interface box are located e.g. on the inside of the track and you and your computer are on the outside.

The only setting here is that you can choose if the signals you give with the software arrival control are valid for all races (like it would be with a hardware arrival control) or only for the visible one.

External control

Argus will act on some predefined questions of an API. An example is TimeTronics' ViewManager that uses this to fetch the list of available races from Argus. The documentation of the API is private to TimeTronics at the moment. But if you have a good idea how to use our camera in your own solution, you are always welcome to contact us on info@timetronics.be.

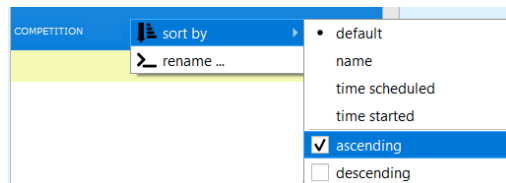
Synchronization methods

In general

The synchronization method is a property of the folder. This way you could e.g. have two folders with separate synchronization properties for different sessions, categories, ... in the same competition. The property of the folder can be set with a click on the info-button in the folder header.



Once you configured the synchronisation method, all races in the schedule are automatically loaded in the list of races. By default, they are ordered chronologically, the latest at the bottom. You can change this behaviour with a right-click on the name of the folder.



If something changes in the schedule in the source of your synchronization method, this is reflected a little later (less than half a minute) in Argus.

For all races, the list of participants is requested when you open the race for recording. If you just want to check the list of participants, you can right-click the race and opt for "show participants".

If you accidentally started the wrong race and you notice it only when the participants have already arrived, you can refresh the participants and select another race. You can choose to rename the race to the correct name. Or, when you manually started a race but you want to load participants of another race, just keep the name of the race.



Depending on the synchronization method, results are uploaded directly at each CTRL+click or when you click the button "upload results".



Now we will briefly describe the available options and their peculiarities.

AthleticsManager

This option is to be used with TimeTronics' AthleticsManager. The AthleticsManager server will appear in the list of servers (if you use a main and a backup server, both will appear). Below that you can select one or multiple sessions and competition days. There is an extra option to

specify if Argus must use the windspeed configuration per race that is configured in AthleticsManager or if Argus can control this (photofinish operator must change the windspeed mode and Argus will remember the last set mode).

Name: give the folder a name...

Sync:



server

competition

sessions

days

follow windspeed settings

Warning: please note that by unchecking 'follow windspeed settings', Argus will not follow the database settings for Wind Measurement. It's the solely responsibility of the photofinish operator to set manually the Windspeed setting for each specific race!

Atletiek.nu


Atletiek.nu is a cloud-based competition management system for athletics competitions, mainly used in the Netherlands and Belgium. You only need the competition-code to authenticate. Also here, you have the option to control windspeed mode yourself or follow the properties of the race in Atletiek.nu.

Atletiek.nu also serves an online scoreboard. To make this live feed in sync with the real event, we need an offset between the Argus computer and the Atletiek.nu-server. This offset is measured automatically. So it is displayed solely for informational purposes. All results are automatically uploaded to the scoreboard with each CTRL+click as well. You can disable this (e.g. on your backup Argus-installation) with the setting "upload results on CTRL+click".

Name: give the folder a name...

Sync:



competition code: 

server time offset: 

upload results on CTRL+click

follow windspeed settings:

Warning: please note that by unchecking 'follow windspeed settings', Argus will not follow the database settings for Wind Measurement. It's the solely responsibility of the photofinish operator to set manually the Windspeed setting for each specific race!

MeetManager

MeetManager is TimeTronics' competition management system of the previous generation. The only configuration needed, is the IP address and port number where MeetManager is listening on.

Name:

Sync:




IP of MeetManager computer: TCP port:

PAR-files and RES-files

PAR-files (for participants) and RES-files (for results) are plain text files in a fixed format. In the synchronization method properties, you define a folder where the PAR-files are stored and a folder to save the RES-files to. If you check-ON the precision-linked box, the precision of the exported result files will be the same precision as displayed in Argus. If you leave the button checked-OFF, the default precision of the current sport will be used.

Name:

Sync:



Participant files:

Result files:

Precision linked:

PAR-files

A *.par file can begin with lines of comment, starting with the # character. After that, every line represents a competitor. You have the possibility to define three fields of data for each Competitor, plus three extra-data-fields. The fields are separated by a TAB character (hex 09).

The first field is the ID, the second the lane, the third the name and then three fields with extra info.

```
#=====
# length=1200m
# place=Bursa
# date=2024-02-26
# race=1
# photofinish-operator=
#=====
11 1 ASKAPLAN orange-blue
7 2 ÇIYA yellow-yellow
8 3 MEN ZER orange-orange
5 4 OKAY DUSTY blue-white
10 5 RED LIFE orange-white
9 6 TAMBORA orange-yellow_dots
2 7 CAVIDANIM yellow-blue
3 8 KIRIKHAN yellow-green
4 9 MISSES LOCKTER purple-white
1 10 SHARPLY DRAWN white-blue
6 11 SULTAN HANIM white-yellow
```

comment

extra info

lane name extra info

ID TAB

RES-files

A results text file starts with one line of information concerning the image, it contains the file name, wind result, file size, lines per second of the recording and the time and date of the recording. The second line is the header for the table below. After that, every line represents a competitor/result. There are at most 6 fields of data for each competitor. The fields are separated by a TAB character (hex 09).

The first field is the place, the second the lane, the third the time and the fourth the ID. After that, you can have the name and extra info fields.

test N/A m/s 3,72 M 800 l/s 24-2-2024 - 16:28:01

Place	Lane	Time	ID	Name	Information
1	11	2:16.15	161	Raki Abubaker	0000,SUD
2	12	2:17.06	164	Ali Belal Mansoor	0000,ERN
3	8	2:18.13	169	Simotwo Suleiman	0000,KEN
4	4	2:18.54	170	Rono Geoffrey	0000,KEN
5	2	2:18.84	168	McIlroy James	0000,GBR
6	6	2:20.00	171	Moustaoui Mohammed	0000,MAR
7	5	2:20.30	163	Jansen Joeri	0000,BEL
8	3	2:23.95	160	Letting Edwin	0000,KEN
9	7	2:26.15	165	Kombich Ismael Kipnetich	0000,KEN
10	1	DNF	162	Ismail Ismail	0000,SUD
11	9	DNF	172	Piet Deveughele	0000,BEL
12	10	DNF	167	Kimutai Philemon	0000,KEN

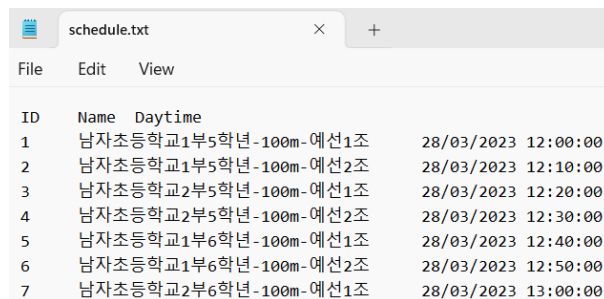
□ = TAB

SCHEDULE.TXT

Optionally, you can define a schedule.txt-file. Schedule.txt is a tab-separated text file. There must be three columns in the file, one for ID, one for the race name and one for the time-scheduled. The first line can be an header line where you can define the order of the columns.

The race name will be shown, the ID is used for the Argus-folder, for the participants in ID.par and for the results file in ID.txt.

The format of the time-scheduled will be detected automatically (one format for all lines), supported formats are yyyyMMdd hhmmss, yyyy-MM-dd hh:mm:ss, yyyy/MM/dd hh:mm:ss, dd-MM-yyyy hh:mm:ss, dd/MM/yyyy hh:mm:ss, dd-MM-yy hh:mm:ss, dd/MM/yy hh:mm:ss, yy-MM-dd hh:mm:ss, yy/MM/dd hh:mm:ss, MM-dd-yyyy hh:mm:ss, MM/dd/yyyy hh:mm:ss, MM-dd-yy hh:mm:ss, MM/dd/yy hh:mm:ss.



ID	Name	Daytime
1	남자초등학교1부5학년-100m-예선1조	28/03/2023 12:00:00
2	남자초등학교1부5학년-100m-예선2조	28/03/2023 12:10:00
3	남자초등학교2부5학년-100m-예선1조	28/03/2023 12:20:00
4	남자초등학교2부5학년-100m-예선2조	28/03/2023 12:30:00
5	남자초등학교1부6학년-100m-예선1조	28/03/2023 12:40:00
6	남자초등학교1부6학년-100m-예선2조	28/03/2023 12:50:00
7	남자초등학교2부6학년-100m-예선1조	28/03/2023 13:00:00

All lines in the schedule.txt-file will match with a race in the schedule of Argus. Additionally also all PAR-files that are not in the schedule.txt (ID.PAR doesn't exist) will be included in the list of races.

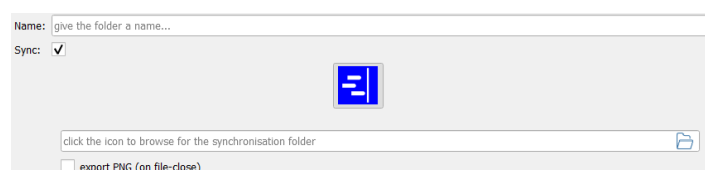
RAS ROS / RaceTech for greyhound

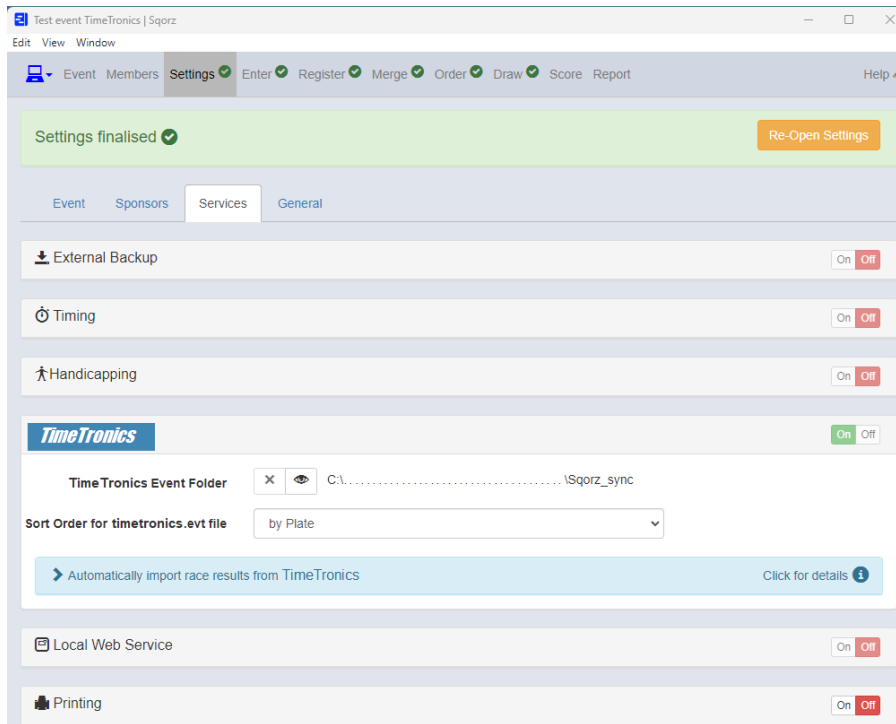
The RAS ROS / RaceTech integration, mainly used for greyhound in the UK, works with one parameter, the competition code you can get from RAS ROS or RaceTech.



SQORZ for BMX

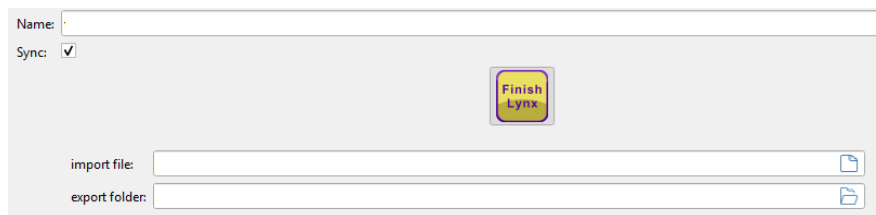
Argus has a very intuitive integration with SQORZ, a solution to support BMX competitions. The one parameter to set in Argus is a link to the synchronization folder of the SQORZ installation, below you find a screenshot where to find this "TimeTronics event folder" as it is called in SQORZ.





FinishLynx (EVT-file and LIF-files)

Argus also integrates using plain text files in the EVT- and LIF-file format. The path to the EVT-file and the path to a folder where to save the LIF-files, are the two parameters.



Swiss Timing) Startlist.CSV and CL-files

Argus also integrates using text-files based on the widely used format of a startlist.CSV. Results will be written per race in a *.CL "classification file". You can define the folder where to look for the startlist.CSV (and concat.TXT if participants are in a separate file). The classification files (*.CL) are put in the same directory.

There is a second option to define a folder where Argus will automatically export JPEG-exports of the photofinish image.



General REST-API

If you have access to your competition management server, or your competition management server hosts open endpoints to be used, the General REST API is the most flexible method to use. You'll need a good knowledge of the management system and a good idea how its datamodel is build.

We will not explain all endpoints in depth. In the settings of the General REST API, there is an info-button for each endpoint. On request, TimeTronics can provide a demo-application to test with (info@timetronics.be).

Name: give the folder a name...

Sync:

Authentication: none

Competition code:

URL for schedule:

URL for competitors:

URL for official results:

URL for unofficial results:

URL to alert next race:

URL to alert race is armed:

URL to alert start:

URL to alert arrival:

URL to post web image:

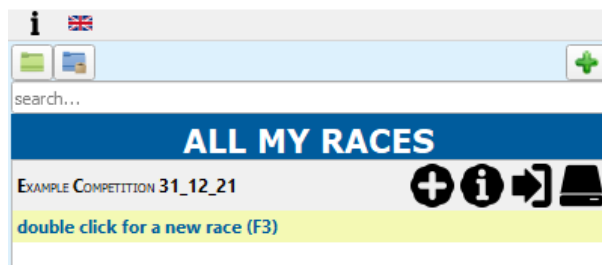
Custom

Custom database connections (ODBC), Excel files, custom plain text files, this is also possible in Argus. However it would take us too far to explain this in detail here. If you have a request for a custom integration, contact us and we'll try to assist as good as we can.

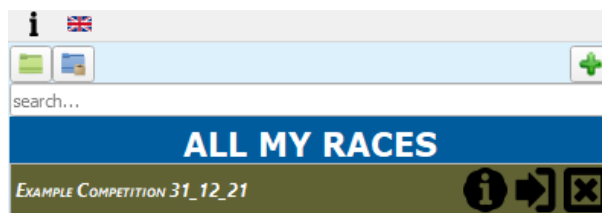
Post Competition Folder Archiving

After you have completed all your races within your competition, you can archive the folder of the competition so that the 'All My Races' section is clear and ready to create a new folder for a new competition.

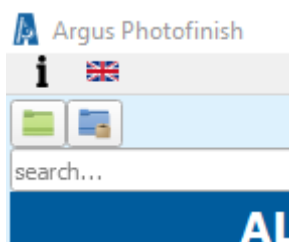
Note, you do not have to do this, you can have as many folders in the 'All My Races' section open as you like, however it would be good practise and make files easier to find if you only have one folder open at a time.



To archive a folder, press the right most icon in the folder header bar. The folder header bar will now turn to indicate this is an archived folder.



If you wish to view previously archived folders, please press the 'open archive folders' icon to the top left of the software window.



To delete old photo finish recordings, please go to C:\Users\%your username%\photofinish_files\archive and delete the folder that you no longer require.

ADDENDUM A. Software Keyboard Shortcuts

Key	Function
F3	Create a new race in the active folder
F4	Scroll through active races
F5	Arm race for start Refresh available camera's when the list of camera's is active
F6	Manually start race
F7	Manually trigger an arrival (arrival while F7 is held down)
F8	Stop race
F10	Toggle block arrivals
F12	Start a manual wind measurement
CTRL+O	Toggle overview
CTRL+P	Print the results of the current race to a file or a printer
Home	Scroll to the beginning of the photofinish image
End	Scroll to the end of the photofinish image (and stick there when new arrivals are recorded)
PageUp	Arm to scroll automatically to the start of the next arrival
PageDown	Arm to scroll automatically to the end of the next arrival
ESC	Close the presentation mode (or any popup window)
Delete	Delete the selected result from the result table
CTRL+mouse click	Set a result in the photofinish image
CTRL+arrows left/right	Move the result line one step (after selecting a result)
CTRL+SHIFT+mouse click	Set a result by lane in the photofinish image
double-click SHIFT	Set permanent result by lane input (SHIFT again to hide it)
Arrows left/right	Scroll in the photofinish image (also in presentation mode)
SHIFT+arrows left/right	Fast scrolling in the photofinish image
mouse wheel	Scroll vertically in the photofinish image
SHIFT+mouse wheel	Scroll horizontally in the photofinish image
CTRL+mouse wheel	Zoom photofinish image
CTRL+ + or - or 0	Zoom-in or -out or reset zooming
ALT	Activate image eye
ALT+mouse wheel	Zoom image eye
double-click ALT	Open permanent image eye window (ALT again to hide it)
ALT+mouse wheel+click	Zoom image eye, move mouse down/up after click to open 2nd image eye to compare close finish
CTRL+SHIFT+mouse wheel	Control Video ID frames in steps

SPACE BAR	Mark this time in the photofinish image (be sure the image has input-focus).
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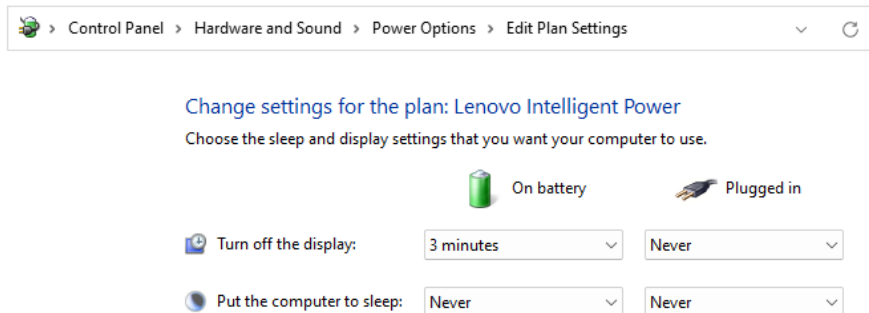
ADDENDUM B: some useful computer settings

During a competition, you need full focus and you expect the same from your computer. However an operation system often feels it needs your attention or even worse, it needs to start background processes, while the only task that should need its attention, is recording the photofinish images. Here we give some advice how you can configure your Windows-computer to achieve this.

Power options

You don't want your computer to go in sleep mode while you are following the race right before the first athletes arrive. Therefore change the power plan options to never go in sleep mode (not even when running on battery power).

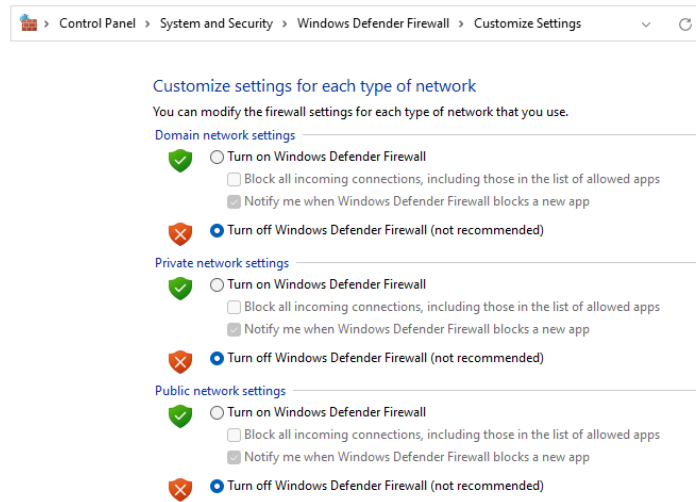
This setting is in Control Panel / Hardware and Sound / Power Options / edit Plan Settings. Note that you can have multiple power plans, be sure to configure the one that is in use.



Switch off virusscan and firewalls

Though we do advise using virusscan and a firewall when using a computer in a day-by-day use. While you are operating a competition as a photofinish operator, you don't want a virusscan suddenly blocking the data stream from the camera to Argus because it thinks it is taking a suspiciously large data throughput. Or your feed to a scoreboard being interrupted by your firewall because it uses a non-standard TCP-port. Therefore, we recommend switching these off. Here is an example how to switch off Windows Defender Firewall.

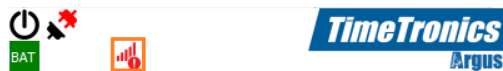
Settings are in Control Panel / System and Security / Windows Defender Firewall / Turn Windows Defender Firewall Off.



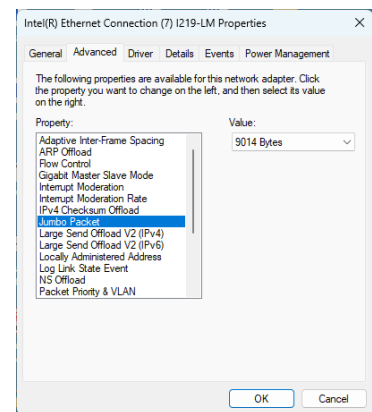
Ethernet Jumbo Frames

We discussed this already in the chapter on connecting your camera. But because it is important, we'll repeat it here.

An Argus camera is streaming in a very fast tempo image data to your computer. To optimize this datastream, it is advised that the camera can send it in larger packets than usual network traffic. This is called the "jumbo frames"-option of your network adapter. This option should be enabled for the network adapter you are intended to use to connect the Argus camera. The software indicates also that this setting is not OK with a red network-warning-icon in the bottom-left part of the screen.



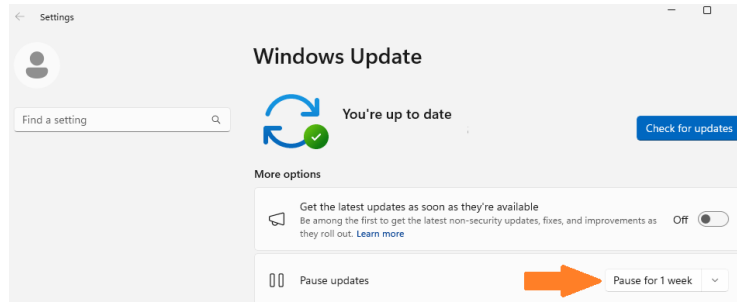
You can find the "jumbo frames"-option in Control Panel\Network and Internet\Network Connections, right click on the network adapter of your choice and select Properties. In the main tab (at the top), select the option to configure the adapters driver. In the new popup-window, go to the tab Advanced and find the option "jumbo frames", set it to the highest possible value (probably 9014 bytes or 9k).



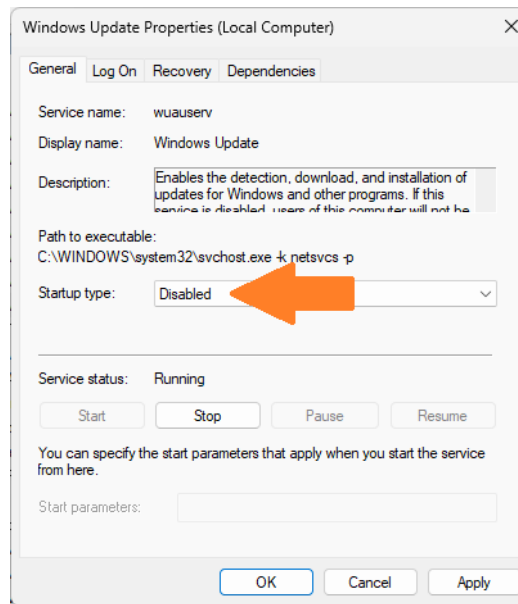
Disable (temporary) Windows Updates

Of course, it is important to keep the latest updates from Windows and firmware or driver updates from the manufacturer of your computer and its components. However, you don't want to risk that during your competition, Windows decides to start an update routine. Worst case, you need to reboot your system and the competition comes to a standstill for half an hour.

You can pause Windows Updates in Settings / Windows Update.



Or more drastically, you can disable the Windows Update service.



ADDENDUM C: General photofinish recommendations

The placement of your photofinish camera

In general, we can only advise you and the customer to:

- a) Make sure that the angle of the camera is NOT below 30 degrees, preferably 35 to 40 degrees = camera must be "high enough". Make sure you understand the relationship between camera angle and picture quality. If you have a low camera angle (10-15°), you will have high detail of the participants, however it will be difficult to distinguish between them if there is a close finish. If you have a high camera angle (40°+) it will be easier to read a close photo finish, however you will have a less detailed image of the participants.
- b) Make sure that the camera is NOT too close to the track, minimum distance to the track should be 5 meters, preferably 7m to 15m (small stadiums) and less than 100m (Olympic stadiums= large expensive lens needed)
- c) Make sure that NOTHING can block the view of the camera, like TV camera(s), spectator(s), fences on the outside of the track, etc...
- d) Make sure that the (photofinish room) window is in the EXTENSION of the finish line.
- e) Make sure that the (photofinish room) window can be opened, giving a clear view to the camera.
- f) Make sure that the operator (in the PF room) has a clear view of the track, especially the 100m start and finish line.
- g) Make sure that there is an underground tube, from the PF-room to the inside (and outside) of the track finish line, to put electrical cables (start and other signals).

Light recommendations

For photofinish recording you need to have a standard 800 to 1800 Lux at the finish line. The rest of the track does not need necessary the same amount of lighting. The quality of the photofinish images will be of less quality if you have less light.

Recommended:

- 1000 Lux for competition without TV broadcast
- 1800 Lux for competitions with TV broadcast

If your budget allows it, we recommend 3-phase lighting to avoid a strobing effect of the lights on the photofinish image. It's not a necessity but a good recommendation if you have the budget. It would be optimal to have the direction of the light coming from the same side as the photo finish camera. For a perfect solution, the light source would be angled to a similar degree to which the photo finish camera is mounted.

We further recommend that your lighting system should not be placed directly under the photofinish. Is it possible that the lighting system would emit enough heat, that if placed under

the photo finish camera, heat waveforms would be produced on your photo finish image. This is something you do not want to see.

Additionally, the lighting system should be positioned slightly in front of the finish line and not before it. This will allow for more light to be directed to the front of the athlete which will produce better photo finish images and assist with the use of VideoID if you are using this. If you were to place your lighting in direct extension of the finish line, then during a close finish, one athlete would create a shadow that would block the light for the athlete behind him/her.

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