

**TimeTronics**

# Manual

## Argus Photo Finish User Guide



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SPORT TIMING SYSTEMS



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## Welcome to the Argus Quick Start user manual.

This guide is intended for those users that have had prior experience with TimeTronics photo finish products and wish to have a quick overview of how the new Argus Photo Finish cameras operate. This guide assumes that the user has the software installed correctly and all hardware connected. For those users that require more detail into the overall functionalities of the Argus Photo Finish cameras (with set up information and troubleshooting), please see our full 'Argus Photo Finish Manual'.

Please note that all pictures are examples, the delivered version can be different than shown in this manual please inform yourself before purchase.

If you, after reading this document, have any further question regarding the operation or service of this or any other TimeTronics equipment, please contact your local distributor or TimeTronics directly, by email: [info@timetronics.be](mailto:info@timetronics.be), or call us at +32 (0) 14 23 19 11.

Please also contact us if you have any remarks or advice regarding this user manual: [info@timetronics.be](mailto:info@timetronics.be)

Good luck and thank you for your confidence in the TimeTronics products and services.

The editors

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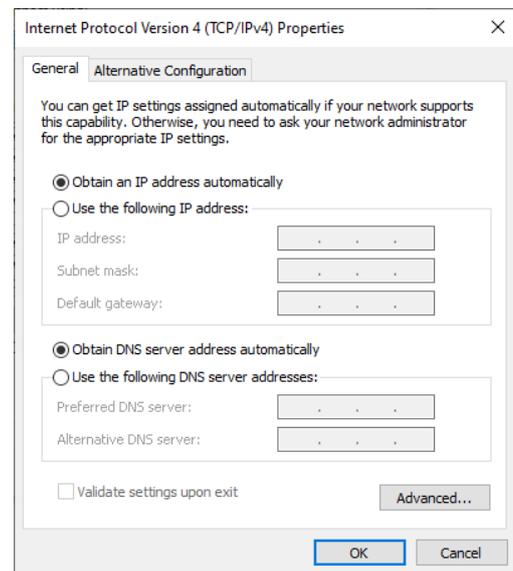
## 1. Software Launching and Initial Set Up

Before launching the Argus software for the first time, there are some key points that need to be addressed before you can begin to use your Argus photo finish camera.

**NOTE:** Upon launching the software and connecting your camera, you will get a warning if the available space on your hard disk is less than 20%. You can click away this message, but it is advised to clean up your disk prior continuing photofinish operations. You can find on page 70 of how to clean up your old photofinish pictures.

### 1.1 Ethernet Settings

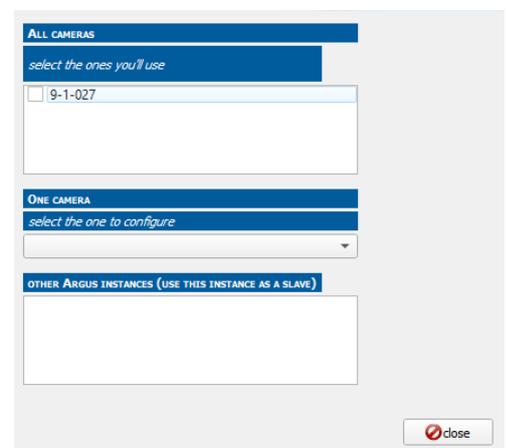
Please make sure that your Ethernet connection settings are set to 'Obtain an IP address automatically'. This option can be found in the 'Change adapter settings' of your 'Network and Sharing Centre'.

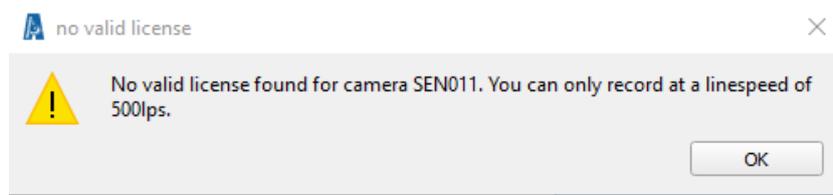


### 1.2 License Key

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.





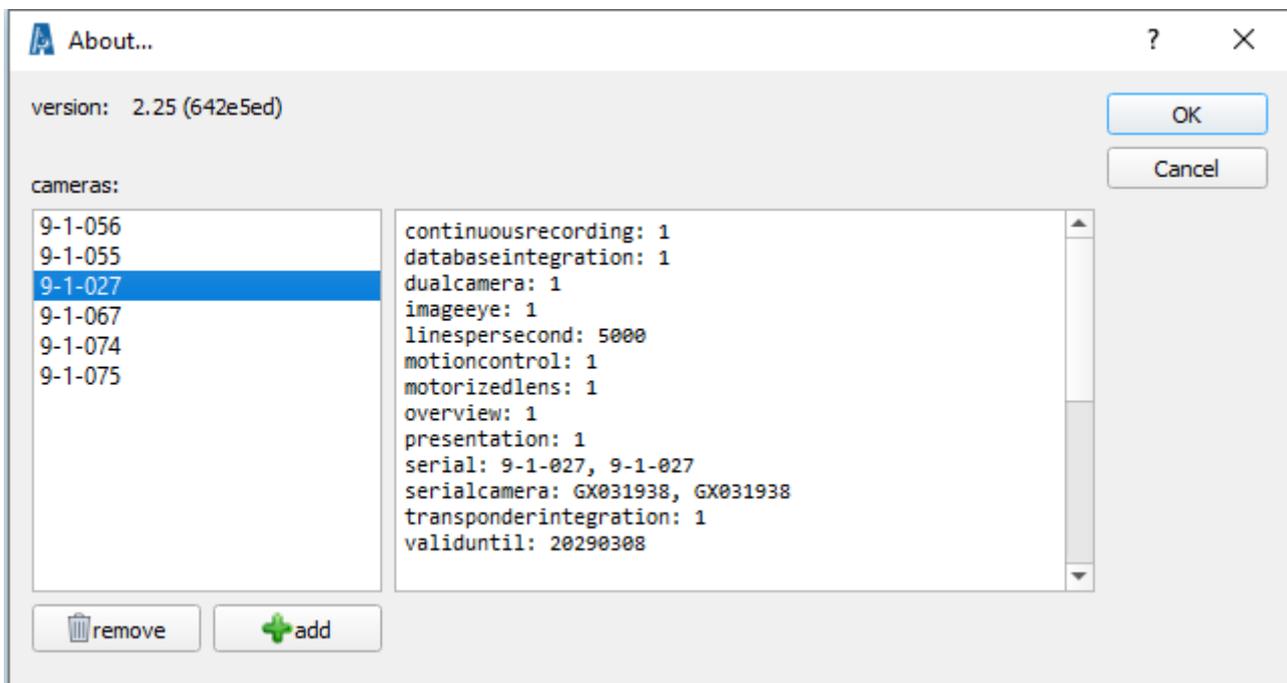
First you will need to locate the licence key for your camera. This can be found on the TimeTronics USB drive inside the carry case of your Argus photo finish camera delivery. The file you require will be Argus xx-xx-xx.lic (where xx-xx-xx is replaced by the serial number of your camera).

To load the licence key into the Argus software, you need to go to the 'i' icon 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.



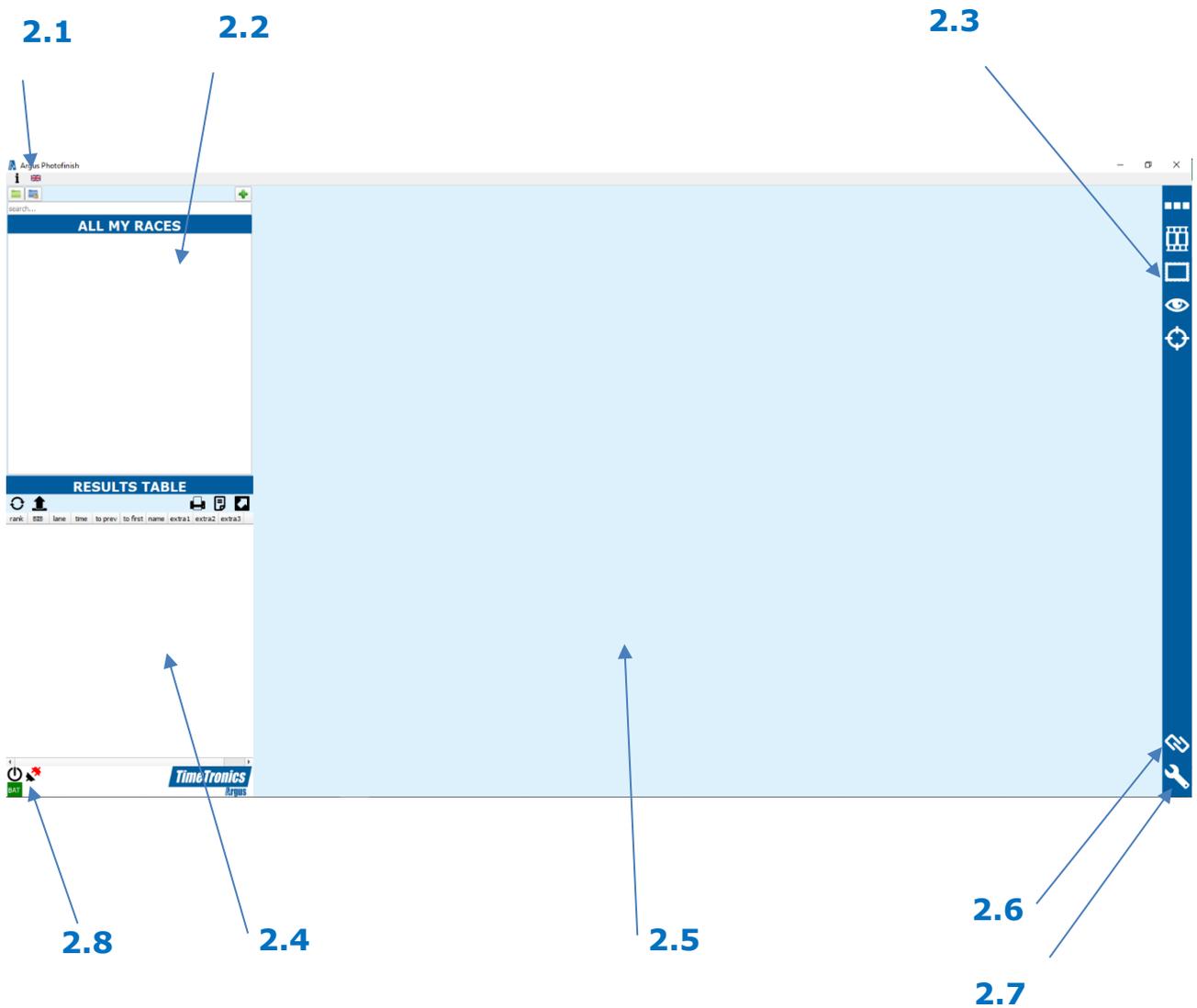
You can now close this window and begin to use your new Argus photo finish camera!

**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.

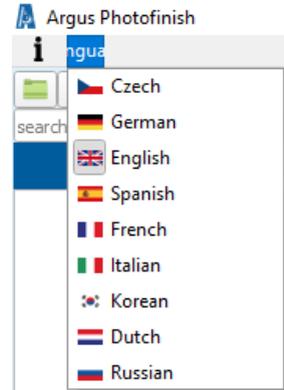
## 2. Main Window Overview

Now you have installed your license key, you are ready to use your Argus photo finish camera for the first time. Here is a quick overview of the main window you will see during your time operating the Argus camera.



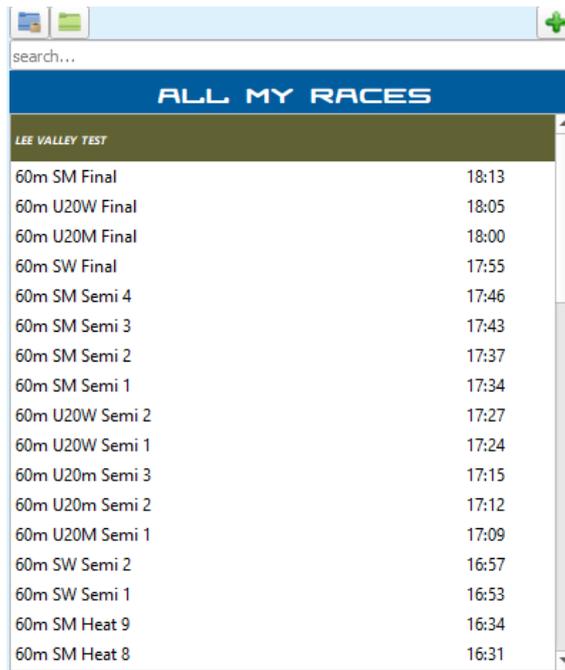
## 2.1 About & Language

As discussed earlier, here is where you can see information about the software (version number and licence key information) as well as change the language that you wish to operate the software in.



## 2.2 All My Races

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 / MeetManager / Atletiek.nu / Seltec data base/Excel import.



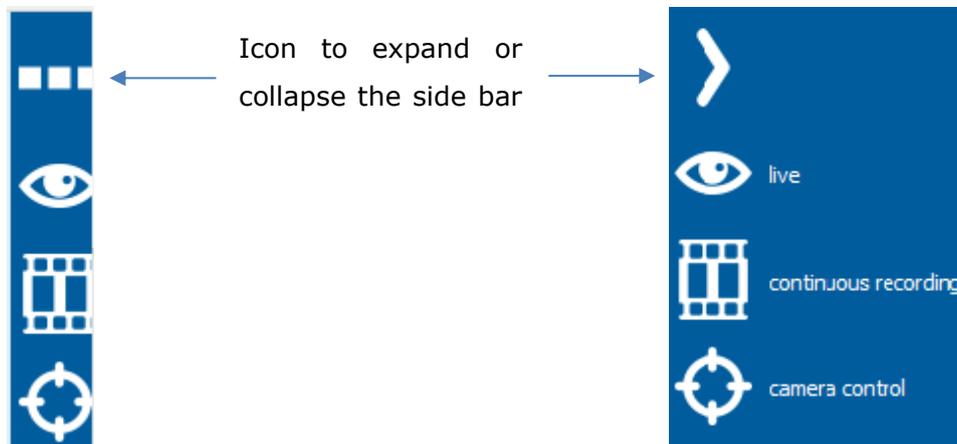
The screenshot shows the 'ALL MY RACES' software interface. At the top, there is a search bar and a green plus icon. Below the search bar, the title 'ALL MY RACES' is displayed in a blue header. Underneath, the race 'LEE VALLEY TEST' is listed in a dark green header. The main content area shows a list of races with their respective times.

Race Name	Time
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
60m SW Semi 1	16:53
60m SM Heat 9	16:34
60m SM Heat 8	16:31

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.

## 2.3 Camera Control

This is the section of the software where you set up and align the camera before a competition and monitor it during one.



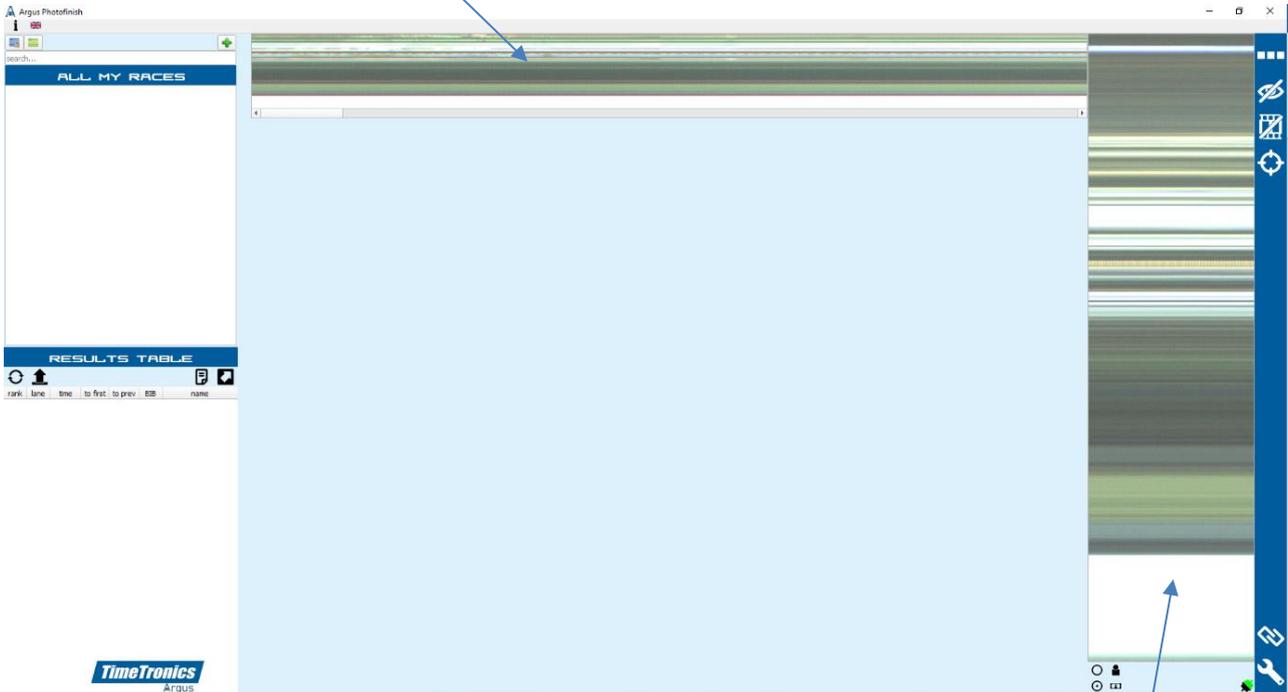
### 2.3.1 Live Camera Preview

Here is where you can see the live camera preview. For previous users of TimeTronics MacFinish software, this is similar to the Window→ Preview function. You will use this view before the competition to make final checks to the alignment of your camera and lens zoom/focus. During the competition you can use this function to check on the quality of the photo finish picture and adjust, if necessary, in relation to any changing lighting conditions (even during a race!).

### 2.3.2 Continuous Camera Recording

For those that have purchased the Argus Pro camera, you will have the option of a Continuous Recording Mode. This is whereby the Argus photo finish camera is continuously recording all footage of the finish line for the previous 20 minutes. Therefore, if you have an incident where you lose Ethernet connection to the camera, have an athlete run under the photocells or forget to set the photo finish system ready to accept an arrival, you can go back and import finish line footage from up to 20 minutes ago into the race file you desire. When selecting the Continuous Recording Mode, you will see the recording at the top of the software window. Will we discuss the operation of this feature in more detail later.

Continuous Recording Mode



Live Camera Preview

### 2.3.3 Camera Control

When you select this icon, the camera control window will be opened, and this is where you will set all the options for your camera (frame rate/motion control/alignment/colour balance settings). For previous users of TimeTronics MacFinish software, this is similar to the Window→ Camera Control function.

**NOTE:** When you launch the software and connect to a camera without a licence key, you will be presented with the no licence key window. However, when you launch the software and connect to the camera with a valid licence key installed, the Camera Control function will automatically open.

## 2.4 Results Table

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	extra 1
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

## 2.5 Photo Finish Picture

When you have a recording, the image of the athletes will appear live in this section of the software window.



## 2.6 Link with Others

Here you can link the Argus photo finish software with additional external hardware, for example transponder timing system, scoreboards, or wind gauges.



## 2.7 Preferences

In the Preferences section of the software, you can configure all the main settings required for the operation of your Argus photo finish camera, for example, sport type, lines before/lines after and software updates.



## 2.8 Camera Status

To the bottom left-hand corner of the software you will see icons indicating the status of different aspects of the camera functionalities.



Always visible whilst using the software, you will see the status of the camera power supply and the start connection status.

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.



**Start not connected.**



**Start connected.**

Further aspects: camera number and Jumbo frames, can be accessed by clicking on the following icon: 

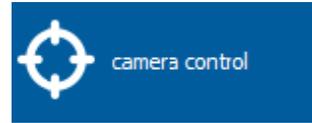
You will be presented with the following:



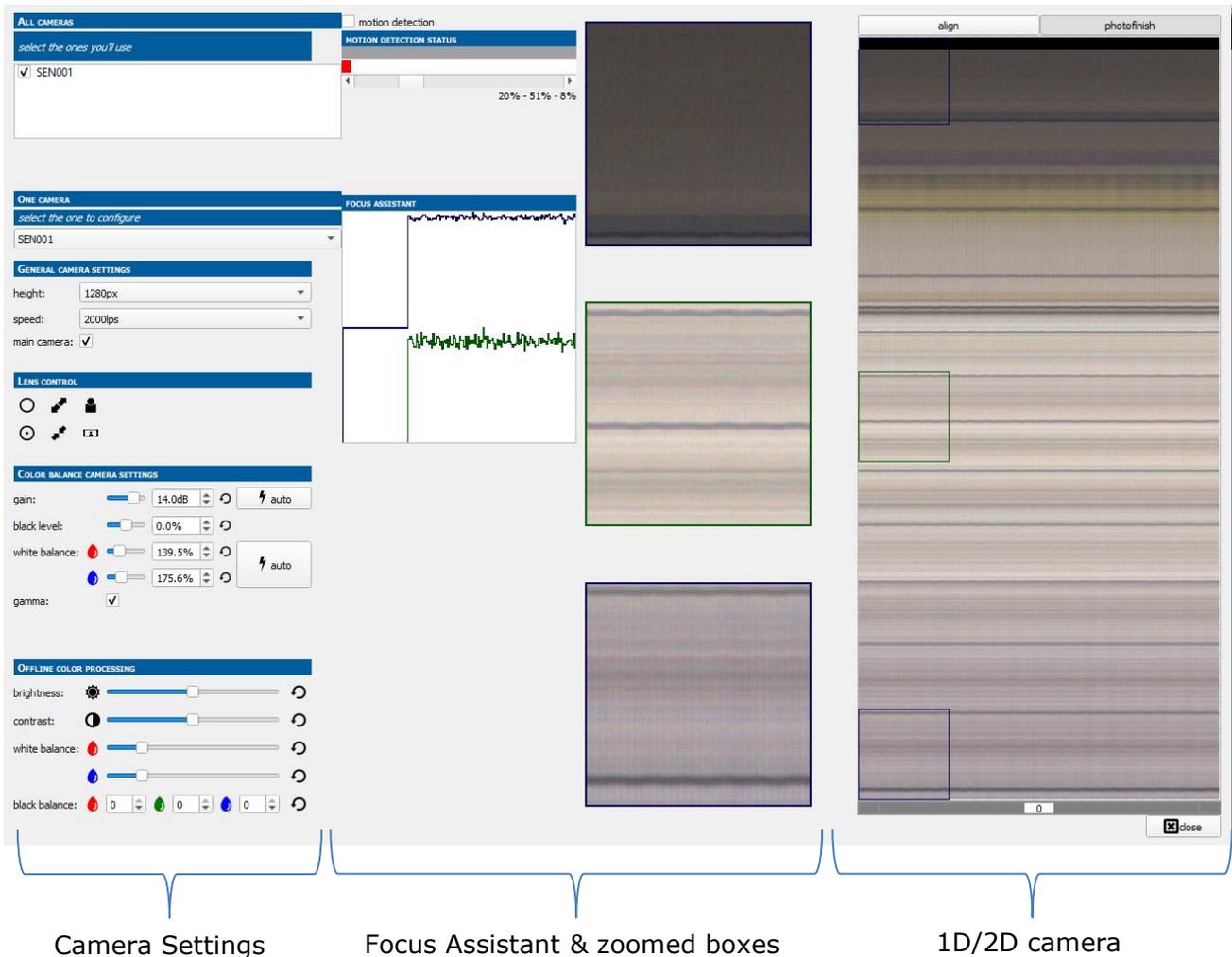
The Jumbo packet status relates to the optimal network settings for the Argus camera operation, and the correct settings are depicted by a green icon. If you see a red icon, please refer to the network settings guide to enable the correct Jumbo packet frame.

### 3. Camera Alignment

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



You will be presented with the following window which has 2 tabs to the top right: align and photo finish. On the align tab you will see the 2D view that the camera has of the finish area and the photo finish tab shows a scrolling camera 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.

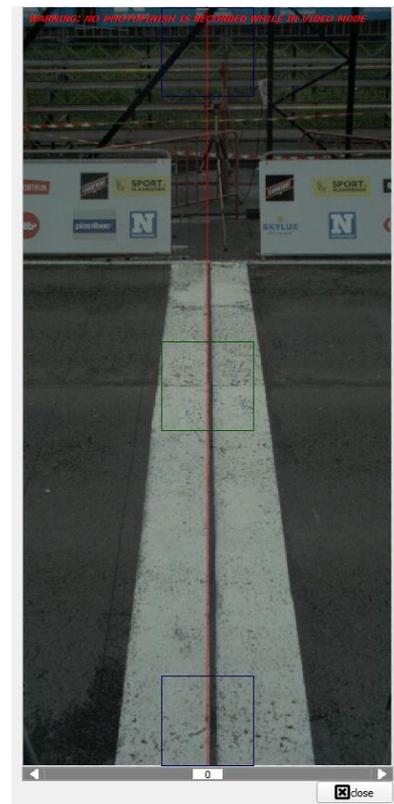
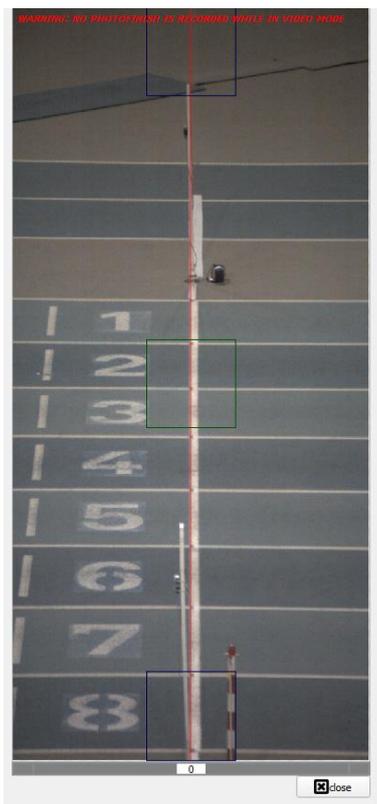
### 3.1 Initial Settings

Before we begin to align the camera, we need to make sure that the recording speed and lens iris settings are correct. This enables the image to be in a good lighting condition, which will make alignment much easier.

Firstly, switch to the align tab so that you can quickly see how the changes you are making to these settings are influencing the lighting quality of the photo finish image. Pressing the 'align' tab will enter the camera into 2D mode.



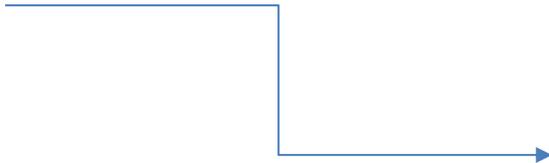
To the right-hand side of the camera control window, you can now see a 2D view of the finish area that the camera is pointing to. Here are examples of an athletics and cycling 2D view finish area (please note, these cameras have already been aligned with the finish line).



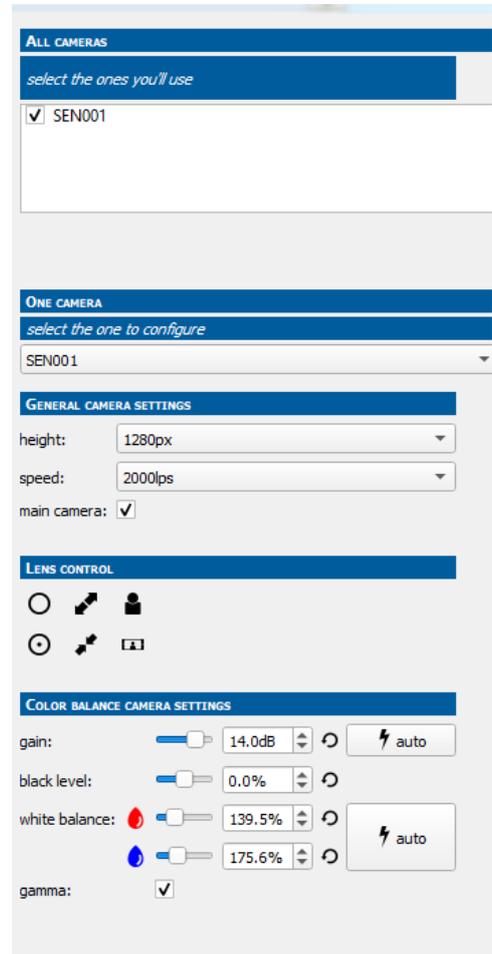
We can now adjust the recording speed of the camera and the lens control of the iris to give us good lighting conditions of the 2D view and therefore assisting us with the of aligning the camera.

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

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

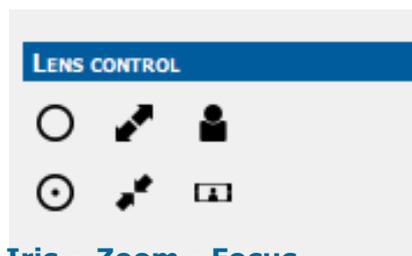


As an example, we recommend; for athletics 1,000 – 2,000 lines, greyhound 2,000-4,000 lines and horse racing/cycling 5,000 lines. Remember, the higher the recording speed, the better the ambient lighting conditions at the finish line need to be, however the more detailed a picture you will record.



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 and right click to move a small step for finer adjustments. Please adjust until you have a 2D view with an optimum brightness level.



Iris – Zoom - Focus

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.

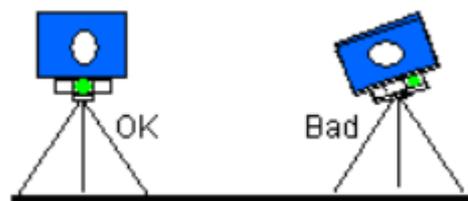
### 3.2 Camera Adjustment

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.

#### 3.2.1 Checking the Spirit Level on the Camera

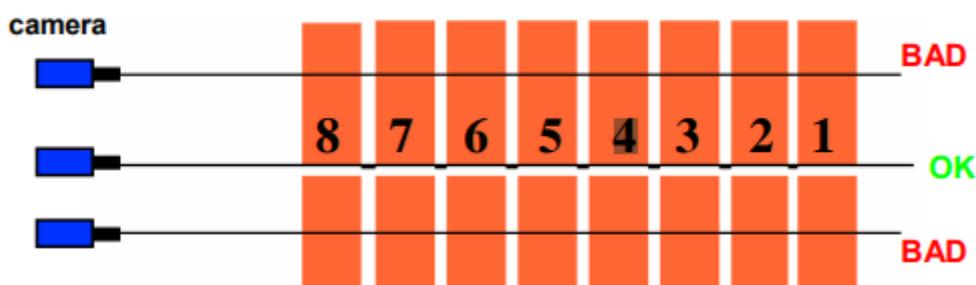
Use the spirit level mounted underneath the camera to position the camera perfectly horizontally. If the camera is tilted to the left or right, you will have a lot of problems in the following steps to record the FULL finish line, the line that you will record will cross over the finish line, and not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



#### 3.2.2 In Extension of the Finish line

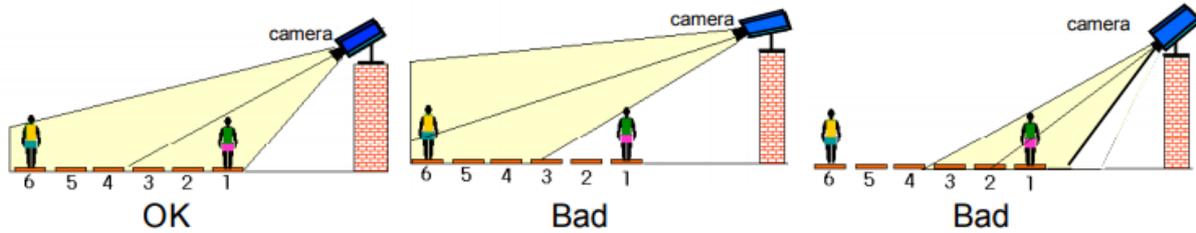
For every sport, it is particularly important that the camera is set up exactly in the extension of the finish line and that the camera's range of vision covers the entire finish line (all lanes).



#### 3.2.3 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

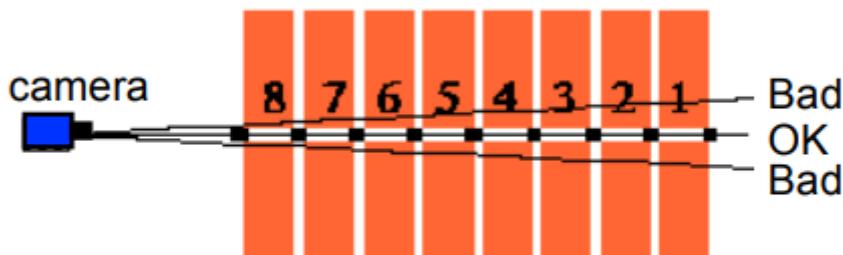
two athletes standing near the finish line. One should stand in the closest lane and the other in the outside of the furthest lane; both athletes must come into the camera's range of vision so that afterwards times can be read off correctly. This means that you will now have to adjust the vertical direction 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.

### 3.2.4. Camera's Horizontal Direction

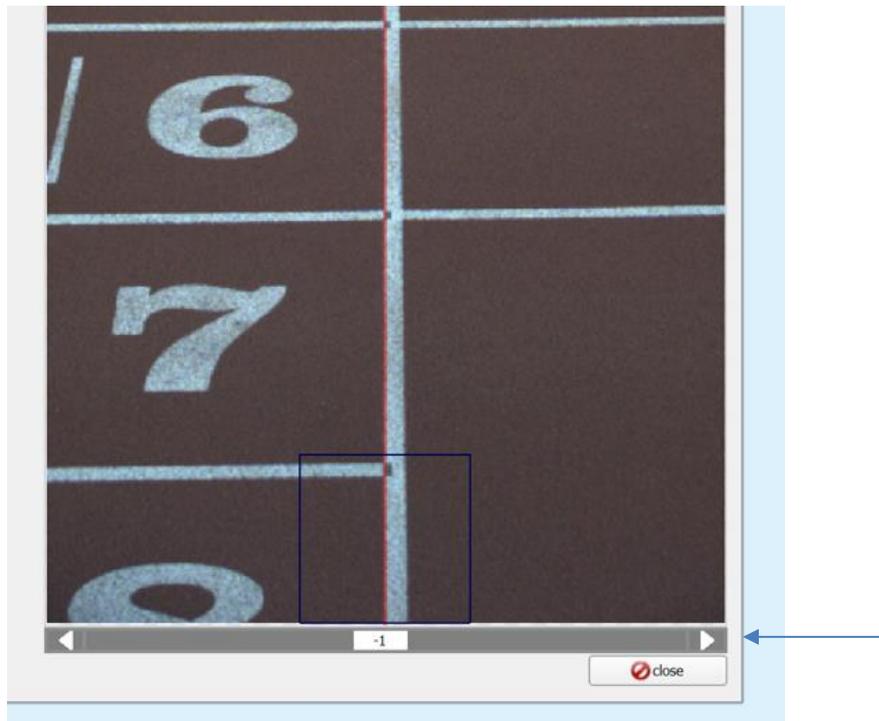
The next job is to direct the camera horizontally at the front of the finish line.



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.

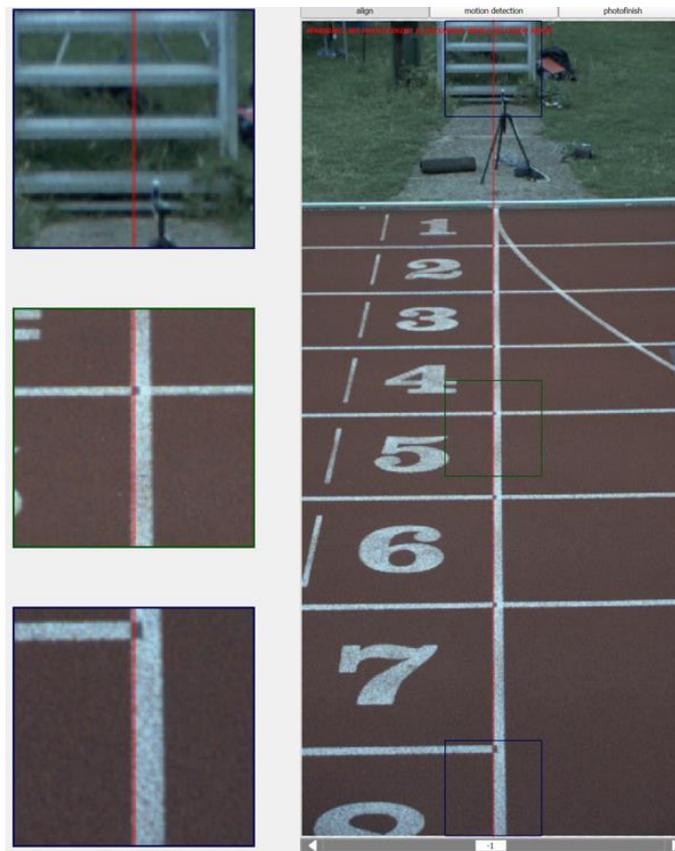
At this stage we have the following:

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

### 3.2.5. 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.

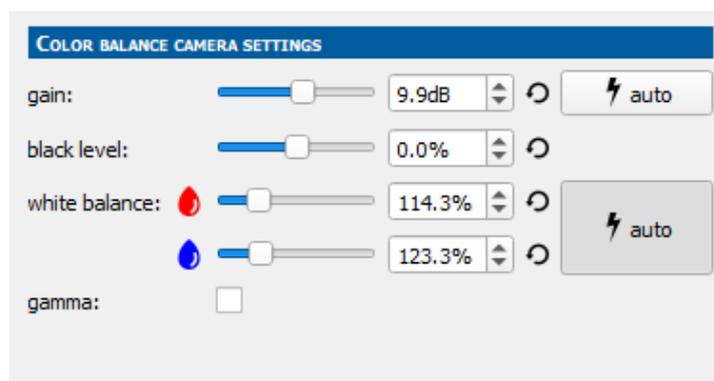
For competitions where you will be using mainly one side of the finish line (for example a competition with 2 sprint races, but 20 endurance races) you need to concentrate on the inside or outside part of the finish line (depending on your camera location) that you will mainly be using. In the above 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.

### 3.2.6. Camera's Colour Balance

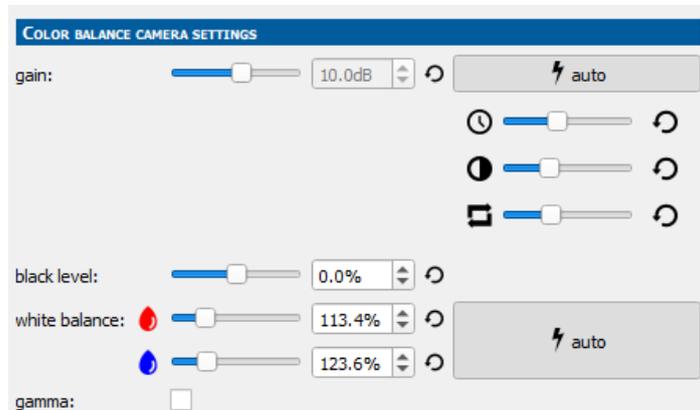
The cameras colour settings can be altered in the 'Color Balance Camera Settings' area. You will see there are 4 options to adjust: Gain, black level, white balance and gamma.



#### 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.

This is extremely useful in low light or floodlight settings and when moving the slider, you will notice that the brightness of your photo finish image will change. You can expand the gain option via pressing the 'auto' button. This will open further options if you wish the software to make continuous changes to your gain during your competition. This would become very helpful in conditions such as a day with sunny intervals and high winds.



You have the options of:  
Sensitivity in time  
Sensitivity in pixel values  
Sensitivity of single step

If you wish to use this feature, spend some time playing with the slider options at different values, noting the change in the photo finish image and select what works best for you.

### **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:**

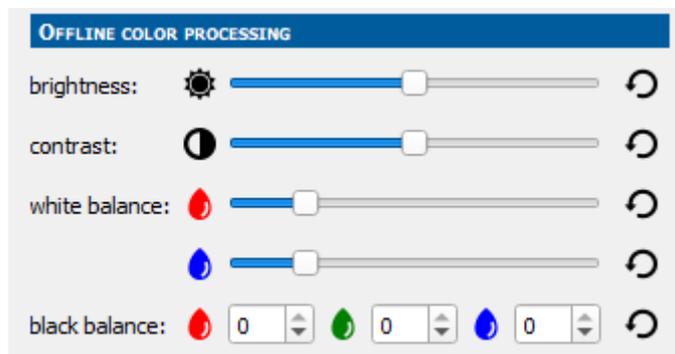
Gamma defines the relationship between a pixel’s numerical value and its actual luminance. Our eyes do not perceive light the way cameras do. With a digital camera, when twice the number of photons hit the sensor, it receives twice the signal. Our eyes perceive twice the light as being only a fraction 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.

**3.2.7. Camera's Colour Balance**

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

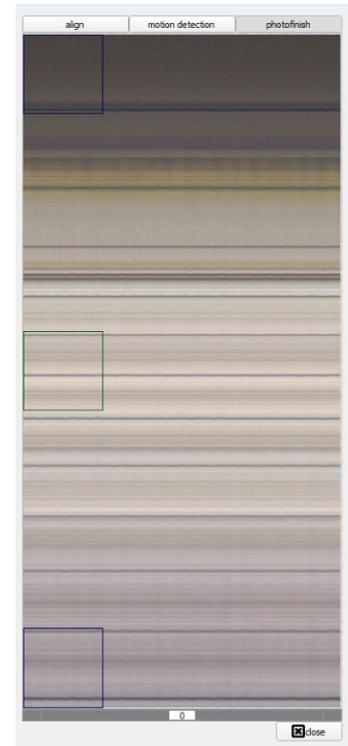


This is a method of colour processing which affects the digital image.

*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.*

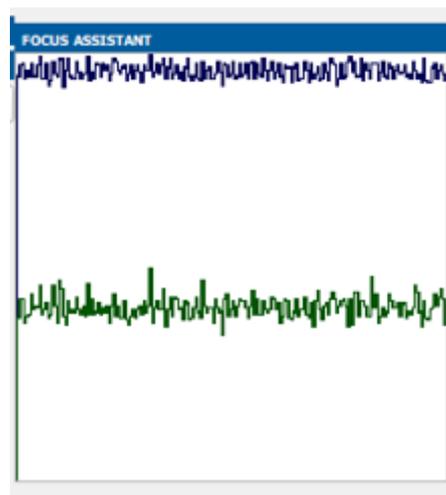
If you still require some enhancements to the brightness/light intensity of the photo finish picture, please increase the contrast and or brightness slider bar to the right until you see a desired effect.

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.

### 3.3 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.

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.

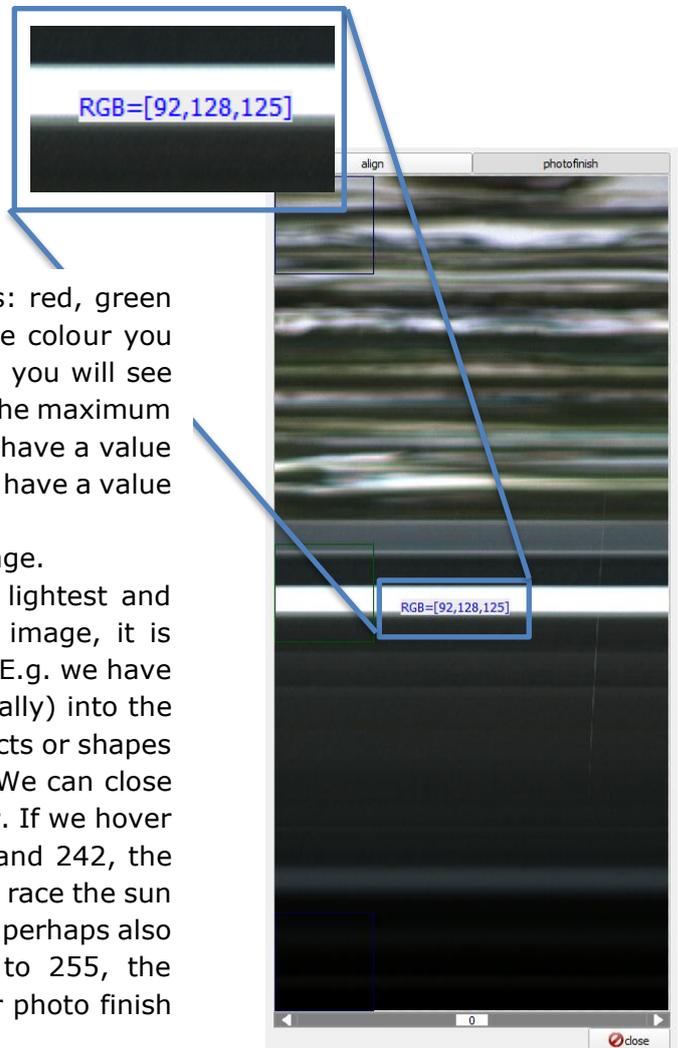
This is important for the dynamic range of an image.

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).

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



### 3.4 Lighting Control Overview

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

Now we have the camera alignment and colour balance optimised, we will now move on to other aspects of the software set up that need to be completed before recording your first race.

## 4. Software Settings

We must now set up all other software preferences to optimise your photo finish system in relation to the sport you are timing.

### 4.1 External Hardware connection

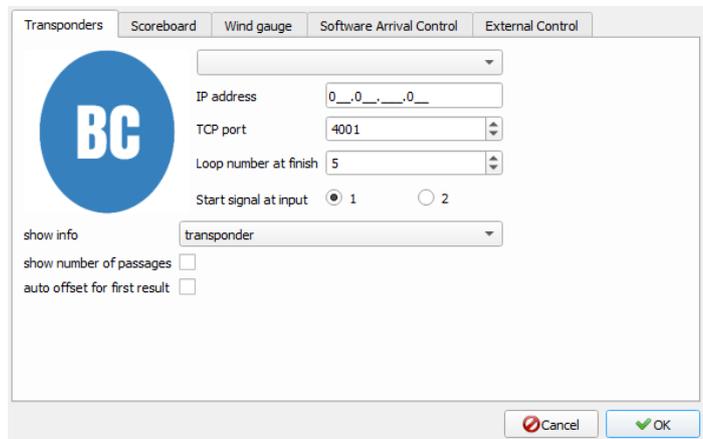
We can now look at connecting your Argus system to various other hardware components which may be needed to fulfil the timing services of your competition.

To do this, click on the 'link with others' icon on the right-hand side blue tool bar, this will open up a new window within the software.



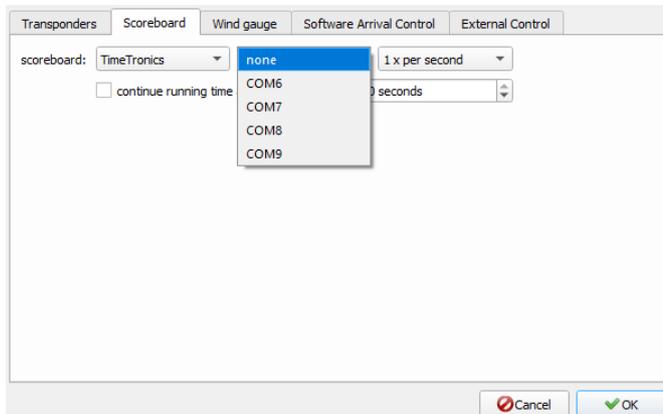
#### 4.1.1. Transponders

Here you can connect to your BeChronized transponder timing system for transponder timing integration. Please note you will need a USB to ethernet adapter to utilise this function as the Argus camera obtains its IP automatically, whereas connection to the transponder timing system requires a fixed IP address.



#### 4.1.2. Scoreboard

The 'Scoreboard' tab is where you connect your Argus camera to the scoreboard you wish to use. Select the type of scoreboard from the first drop-down list and then the com port you wish to use for this connection. If you do not see any com ports available, please make sure you have inserted your USB to serial device and have the drivers for these installed correctly on your PC.

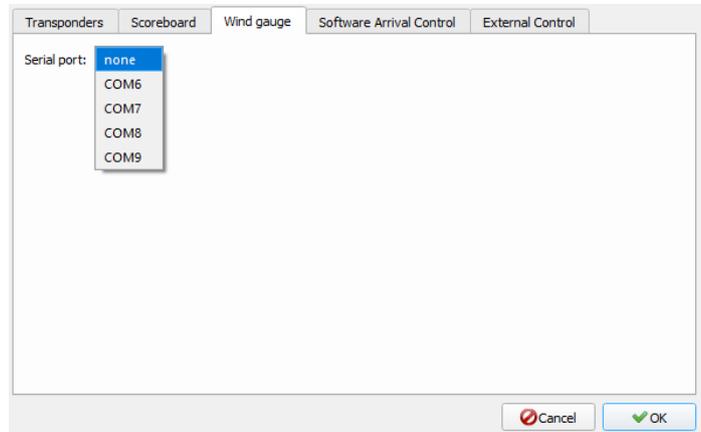


In this tab you can also select the times per second the scoreboard will run at and if you desire, how many seconds after the finish arrival the scoreboard will freeze the unofficial winning time for, until it reverts to the running time again (very useful for athletics competitions and races of 600m and above).

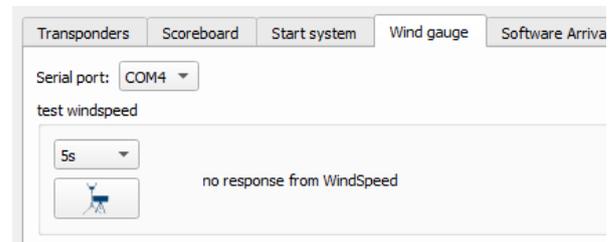
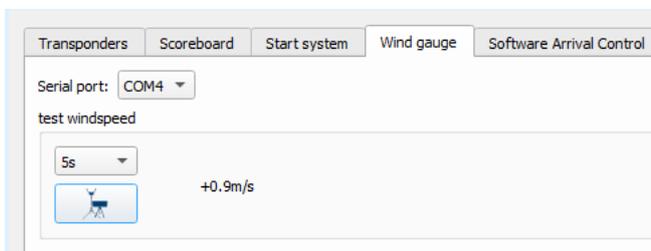
NOTE: If you are using the old electromechanical/flip digit scoreboard or the single line LED scoreboard (TTC-409), please ensure the mode of the scoreboard is set to 1.

### 4.1.3. Wind gauge

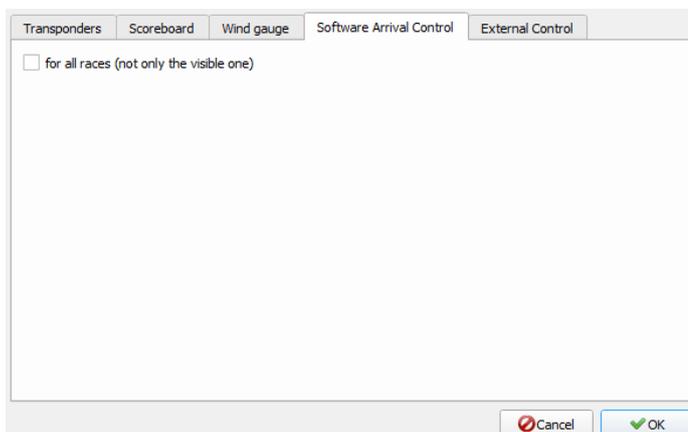
Connection to your TimeTronics WindSpeed can easily be configured in this tab. Simply select the com port you wish to use for the WindSpeed connection from the drop-down list.



When you have selected your port for the WindSpeed, you will then be presented with a test option below. Select from the dropdown list the time duration that you wish to perform a test for and then press on the WindSpeed icon (below the dropdown list) to start the test. If all is connected well, you will see the text 'measuring' to the right of the WindSpeed icon and the windspeed result will appear. If there appears to be no connection, you will see the text 'no response from WindSpeed'.



### 4.1.4. Software Arrival Control



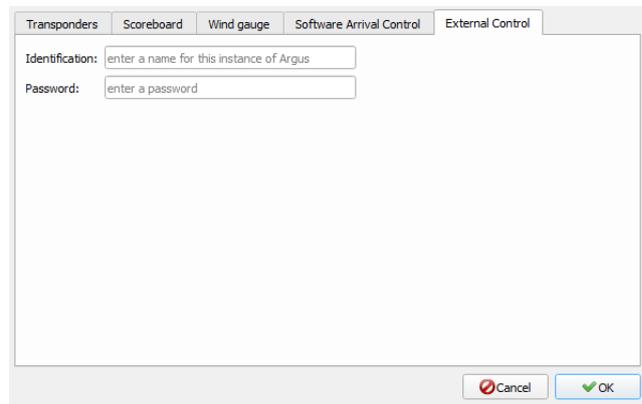
The software arrival control is a feature for the software arrival control device (Pxxx). This is a device like the arrival remote control (which you plug in the interface box) but instead you plug it in the USB of the computer. It will mimic the arrival remote control and you can switch to auto, off and on for controlling the arrivals. Please check the box in this tab if you have this device and wish to use this feature.

### 4.1.5. External Control

The external control is an interface on Argus which allows control of the camera, races, etc from a remote device.

TimeTronics have created an API with certain functions e.g. to get the schedule on the Argus computer, get participants, put the camera in 2D mode etc...

At the moment it is intended to be used only by TimeTronics and there is no current documentation about the api and which functions a third party can use.



## 4.2 Preferences

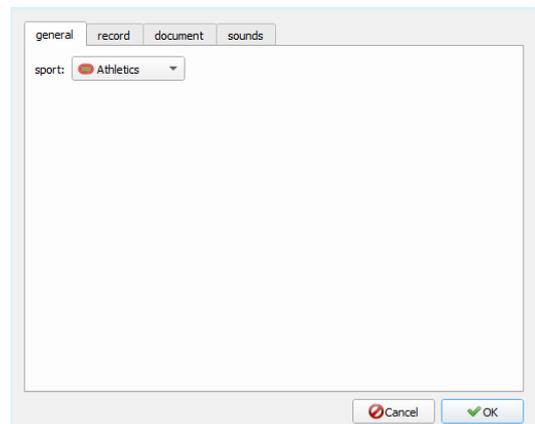
Every sport will have slightly difference requirements from the Argus camera and the options for these can be selected from the preferences section.

To do this, click on the 'preferences' icon on the right-hand side blue tool bar, this will open a new window within the software.



### 4.2.1. General

Here you can select from the drop-down menu which sport you are using your Argus system on. This will change various aspects of the software, for example results table layout and time display.



### 4.2.2. Record

On the record tab, you can change aspects of the cameras recording and the file name creation of races (if you are not using additional software/database software).

### Record Before Arrival

This is where you can change the number of lines per second the camera captures before an arrival signal. As a good rule, set this to 10% of the recording speed of the camera. However, if your arrival beams are for whatever reason not able to be placed very close to the finish, you may need to adjust this number.

If your arrival beams are located far *behind* the finish line, as an example for athletics this would be 30-50cm or more, then you would need to *reduce* the number of lines per second in this option.

If your arrival beams are located far **ahead** of the finish line, then you would need to **increase** the number of lines per second above the 10% of the camera recording rate in this option. Please note, the maximum number of lines per second you can record before an arrival signal is 1,000.

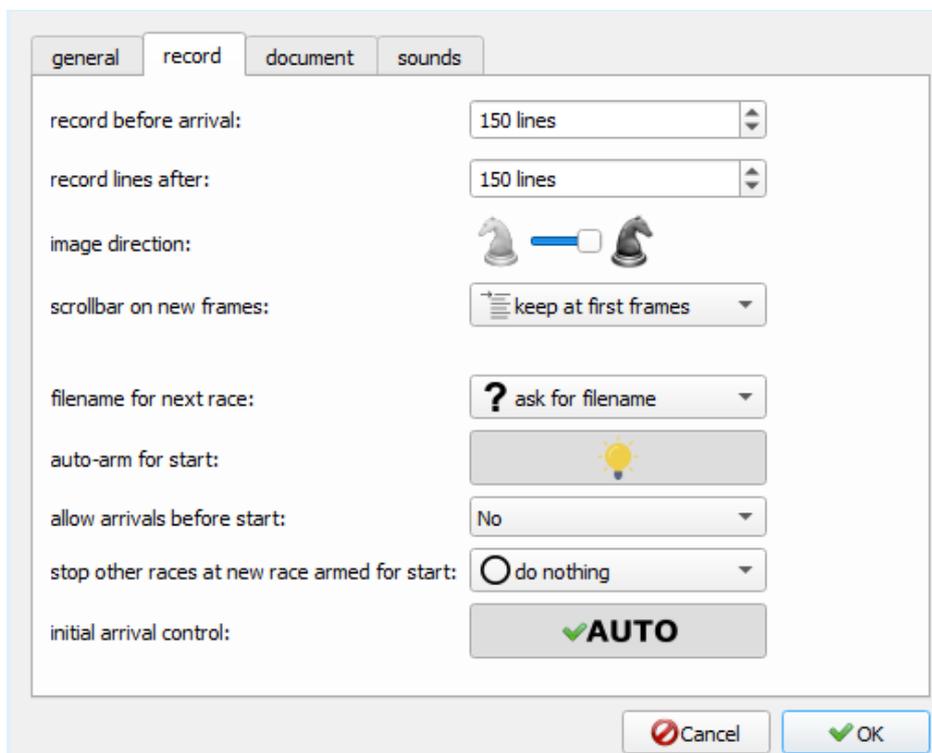
### Record Lines After

This is where you can change the number of lines per second the camera captures after an arrival signal. As a good rule, set this to 10% of the recording speed of the camera. However, if your arrival beams are for whatever reason not able to be placed very close to the finish, you may need to adjust this number.

If your arrival beams are located far *behind* the finish line, then you would need to *increase* the number of lines per second in this option.

If your arrival beams are located far **ahead** of the finish line, then you would need to **decrease** the number of lines per second below the 10% of camera recording rate in this option.

Please note, the maximum number of lines per second you can record after an arrival signal is 1,000.



### **Image Direction**

Please select the appropriate horse chess piece that correlates to the running direction of your participants.

If your participants are crossing the finish line moving from right to left, then please select the left side horse. If your participants are crossing the finish line moving left to right, then please select the right-hand side horse.

### **Scrollbar on new frames:**

When a photo finish image is being created, if it becomes larger than the width of the window on the screen, then you have two options in how the image will behave. If you select 'keep at first frames' then the image will stay on the position of the first frames, however if you wish the image to automatically show the latest recorded frames, then please select 'keep at last frames'.

### **File Name for Next Race**

*\*You only need to use this option if you are intending on creating race name files manually and are not intending to use an additional software/database software\**

Here you can select whether you wish for the software to automatically assign a file name or ask for a filename from the photo finish operator. This will be explained further when we look at race file creation.

### **Auto-Arm for Start:**

When you click on a race to begin a recording, you can have the option for the photo finish system to either be not armed or automatically armed. This is a light bulb icon which you can turn either off or on/yellow via a left mouse click. The 'Off/no light' setting would lead to the start not being armed when a race is selected. The 'On/yellow' setting would result in race being automatically armed when it is selected, we would envisage that the auto arm function would be used for many sporting cases.

### **Allow Arrivals Before Start:**

This is a No/Yes drop-down menu option that will either allow/prevent the recording of images if there are arrival signals even before a start signal has been given (the race will need to be armed). In most sporting cases, we foresee this setting to be 'No'.

### Stop Other Race at New Race Armed for Start:

In this option you have three possibilities:

#### Stop other races

If you have race 1 running and select and arm race 2, the software will stop the running time of race 1 and no further recordings can be made into race 1.

#### Ask to stop other races

If you have race 1 running and select and arm race 2, the software will show a prompt window asking: 'There is 1 other races running. Are you sure you want to stop this?' If you select 'Yes', then the software will behave as per the previous option and stop the running time of race 1 and no further recordings can be made into race 1. If you select 'No' then race 2 will become 'armed' and the running time and therefore the recording of images to race 1 will continue. With this option, it is possible to have the start for race 2, while the previous race has not yet finished.

#### Do nothing

With this option, the software will behave as if you had selected the 'No' option in the 'Ask to stop other races function.'

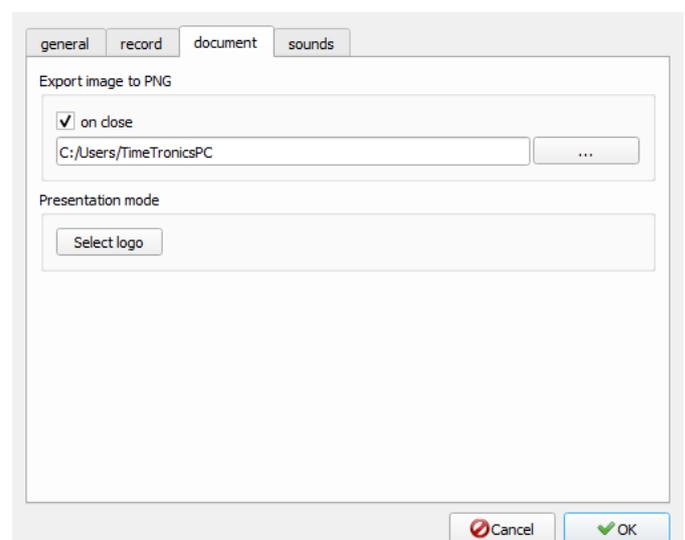
### Initial Arrival Control

This is a toggle option between Auto and Block controlling the condition of the arrival control within the Active Race section of the software (we have not discussed the Active Race section of the software yet; this will come shortly). Simply left mouse click on the icon to toggle between the two options.

### 4.2.3. Document

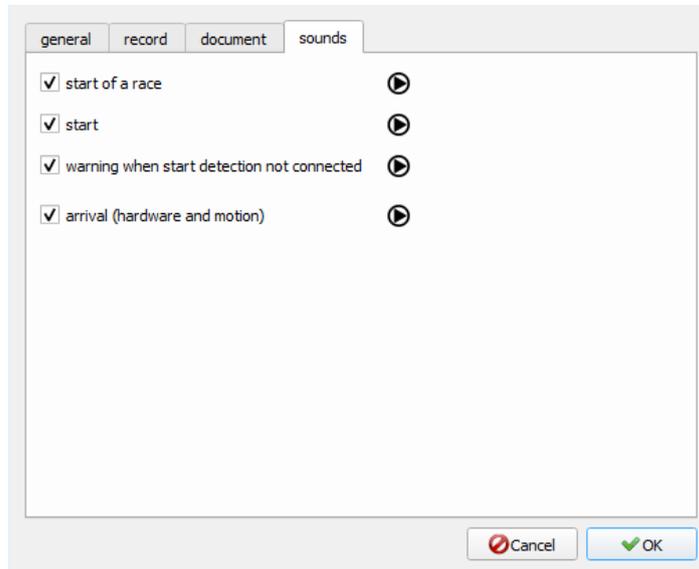
On this document tab, you can set the Argus software to automatically export a PNG of your photo finish image to a location on your PC. Insert the location of where you wish the images to be saved to in the file path and check the 'on close' box. When you close a race file, a PNG will automatically be created.

If you have presentation mode, you can add your own logo to the created image. Press the 'Select logo' icon to upload an image that will then be shown to the bottom left when you enter presentation mode.



#### **4.2.4. Sounds**

The Argus software will emit various sounds to alert you to various states that the software is in. In this tab you can turn on or off these sounds via the checkbox and you can hear an example of the sounds available to you by pressing the play icon to the right of each option.



#### **Start of a race**

This is a bang sound that will be given at the start of a race.

#### **Start**

This will be a short buzzer sound when a starting device is connected. Please note, if you are using a manual start detector, this sound will also emit (when a race is not armed) when the detector is plugged in and hit. It would be common for the starter to hit the start detector many times before a race while he/she is preparing various items, and therefore when starting races with a manual gun, you may find it more pleasant to uncheck this option.

#### **Warning when start detection not connected**

When a start detector is not connect to the Argus and you arm a race, you will hear a prolonged clicking alarm sound. This is in addition to the visual cue which will always be visable at the bottom left corner of the screen.

#### **Arrival**

A beep sound will be heard when an arrival signal is given via the photo cells or arrival remote control (not with a manual arrival on the software).

## 5. Lane Intersection Alignment

There is just one more step we need to complete before we start getting to the interesting part of creating your races!

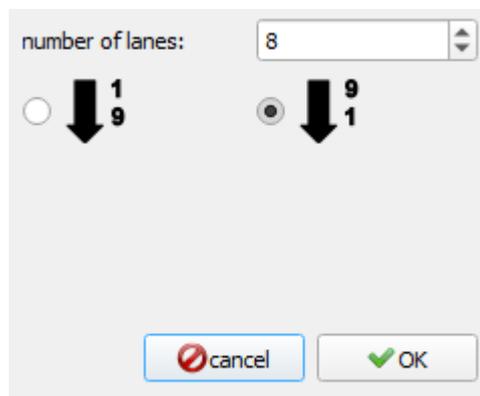
For athletics, you need to tell the software where the lane intersection marks are to allow for the reading of a race/athlete identification by lanes.

To do this, click on the 'live' icon on the right-hand side blue tool bar. This will open the live scrolling camera preview section which will emerge from the right of the screen.



To the left of this preview section, you will note a vertical list of numbers that represent the lanes on your athletics track. First, we need to adjust the settings, so you have the correct number of lanes in the correct direction. Double click on the vertical list to open the lane intersection settings window. From here you will be able to select the number of lanes your track has and then determine the direction of the lanes in relation to the position of your camera to the athletics track by clicking on the appropriate radio button.

If your camera is on the outside of the track, then you will need to select the left-hand side radio button. If your camera is on the **inside** of the track, then you will need to select the **right-hand** side radio button.



Once you have completed this, click ok and you should see the correct number of lanes in the correct direction. To align this vertical list to your photo finish image lanes, simply click and drag on the small black line in between each lane section.

## 6. Creating Races

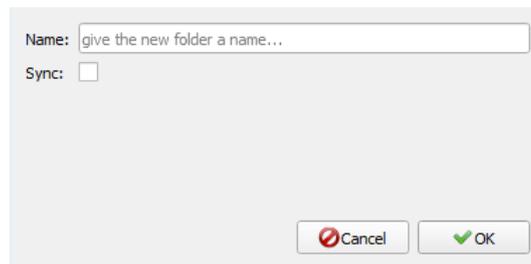
As the Argus camera is live recording camera, you first need to create a race and select it to tell the software that you wish to assign any starts/arrivals signals to that race. You can either do this race creation manually or using an external database/competition management software. For either case, you will first need to create a new folder to store all your race files in.

### 6.1 Folder Creation

Create a new folder by clicking on the green folder icon to the top right of the screen.



A window will appear asking you to insert a name of your folder. We recommend a name that combines the competition name and date so that it is easy to search for in the future.



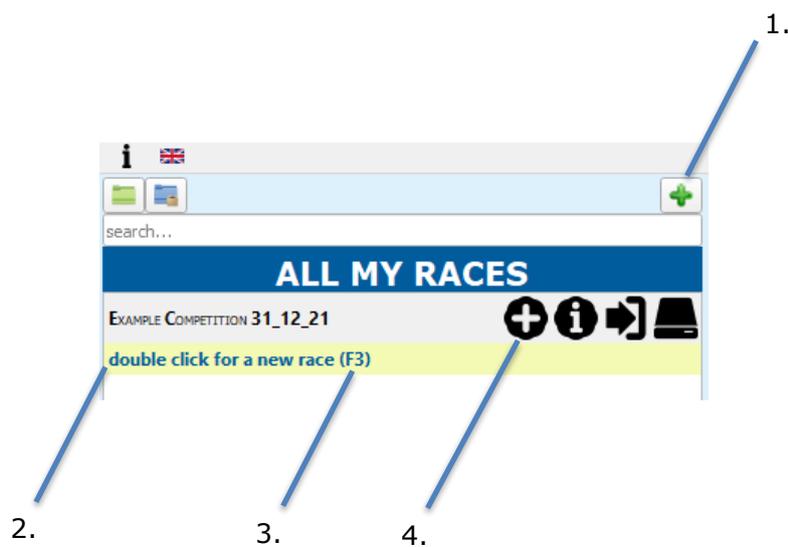
Under the 'All My Races' section of the software, you will now see the folder that you have just created. If you hover your cursor over the folder name, you will be presented with additional folder feature icons to the right of it. Functionalities of these icons will be discussed in this section.



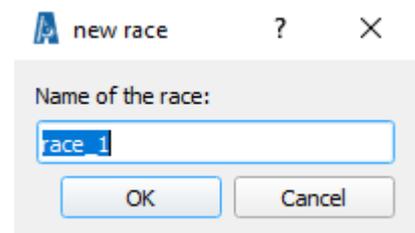
## 6.2 Adding Races Manually

If you are not using an external database/competition management software, you will need to create your races manually. This can be completed in several ways:

1. Clicking on the green '+' icon above and left to the 'All My Races' section.
2. Double clicking on the yellow bar below the folder name.
3. Pressing F3 on your keyboard.
4. By clicking on the '+' icon within the folder name bar.

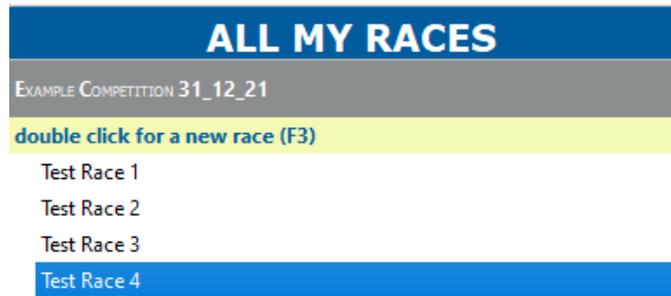


If you have selected 'ask for file name' in the Preferences->record -> file name for next race tab, then a window will be displayed asking you to declare the desired name of the race. Press ok and then you will see this race in the 'All My Races' section.



If you have selected 'auto assign filename' then you will not be presented with the window above, but instead you will see a race name appear in the 'All My Races' section.

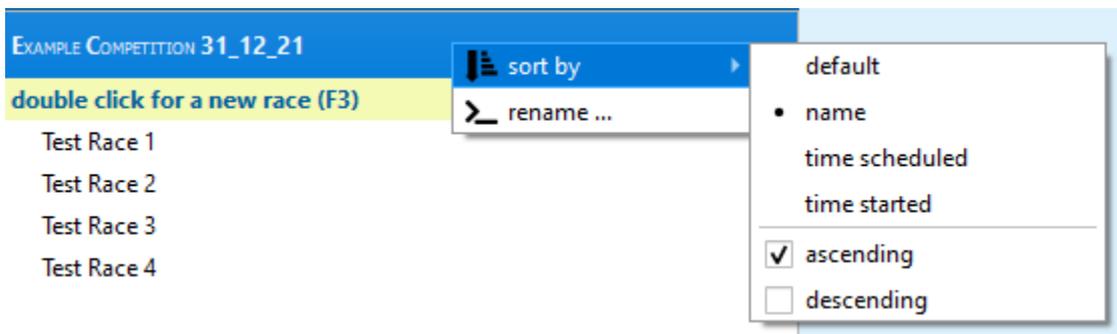
If you know all the race names you have for your competition, you can create these in advance of your first race.



If you wish to edit a name of a race or delete it, you can do this by right clicking on the race name. You can only do this if there is a white space to the left of the race name, the occurs when you have not selected that race.



If you wish to change the way the list is sorted, you can do this by right clicking on the folder name bar and choosing sort by ->

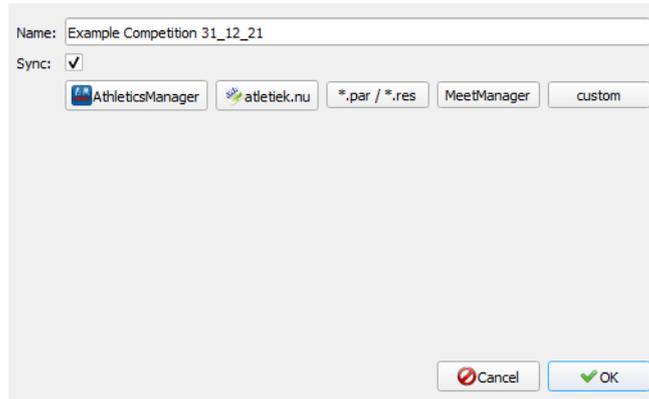


### 6.3 Adding Races Using External Race Management Software.

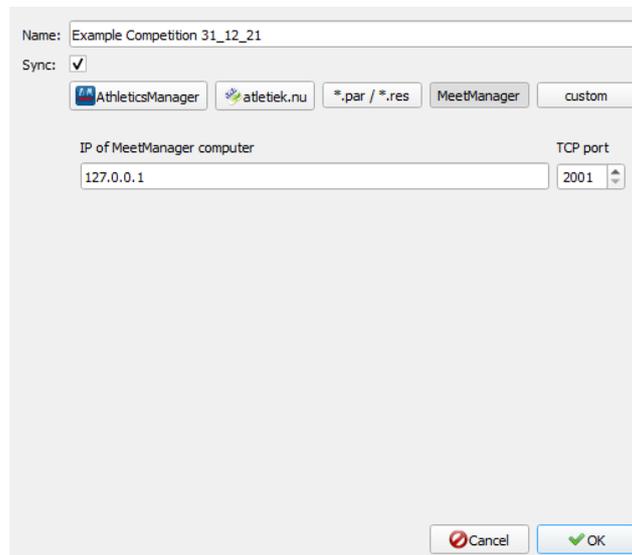
When you have created your folder, you need to connect it to your external race management software. Please click on the 'i' icon within in the name bar.



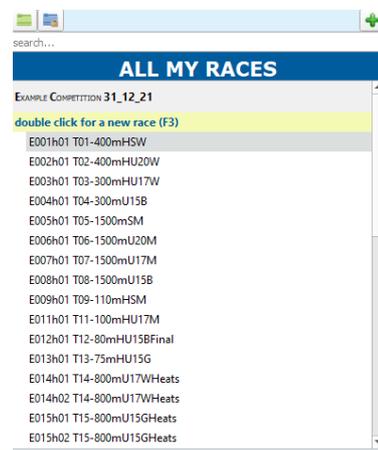
Click on the 'Sync' check box in the next window and a range of different software options will be available for you to connect your folder to. For this example, we will use the MeetManager option.



Click on your desired software and enter the connecting credentials. For the MeetManager, you will need to insert the IP address and TCP port number (127.0.0.1 is a local IP address whereby the Argus and MeetManager software are running on the same PC).

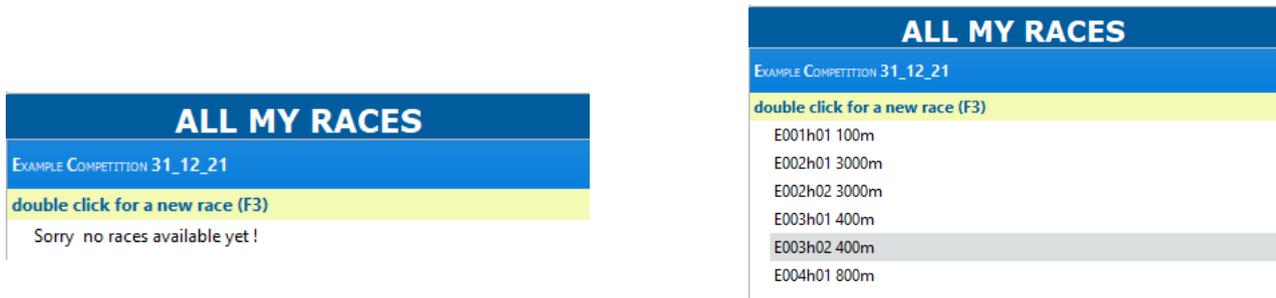


If your race management software has already been populated with the races of the competition, you will now see these in the 'All My Races' section.

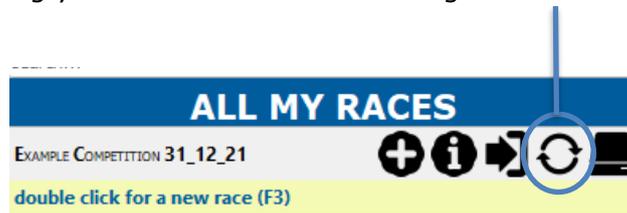


You can add races manually to this list (for example a gun test image for athletics), please see the instructions above '6.2 Adding Races Manually' for assistance with this.

If your race management software does not have any race data within it, then a 'Sorry no races available yet!' will be displayed. When races have been created, with participants, the list will update automatically after a few seconds.



If you urgently need the new race data and you do not see it in your list, you can do a manual refresh by clicking on the refresh icon within the folder name bar (this is a new icon that you will see after synchronising your folder to the race management software).

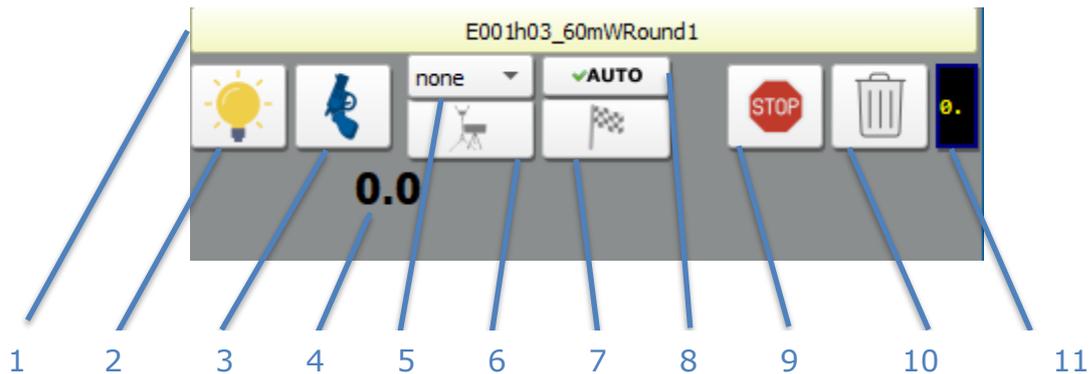


**Fantastic! You have now aligned the camera, optimised the picture quality and have your races all ready to go. Let's get to the fun part and start taking some photo finish images!**

## 7. Creating Photo Finish Images

When you double click on a race, you will open new functionality above the 'All My Races' section. This 'Active race' section is used to control the camera when recording a race.

### 7.1 Active Race Controls



#### 1. Race name

2. **Light bulb icon**, press this to arm/indicate you are ready to accept a start signal to the Argus camera. If the lightbulb is clear, the system is unarmed; if it is yellow, it is armed.

3. **Gun icon**, left mouse click will initiate a manual start, right mouse click will give additional functionalities discussed later in the manual. When a start is given, the gun icon will move from a vertical position to a horizontal one.

4. **Running time**; when a race starts, here is where you will see the running time. This will stop when an arrival is detected.

5. **WindSpeed drop down list**. Here is a drop down list of the different wind speed settings you can select for a race. If your Wind Speed is not connected well, you will receive a warning message and the software will disarm the camera.

6. **WindSpeed manual button**, used to take a manual recording of a windspeed measurement.

7. **Manual arrival button**, as well as using finish beams and an arrival remote control to capture finish signals, you can also give a manual arrival signal from the software. Press this icon or F7 on the function keys to generate this.

8. **Arrival control status**, you can toggle between auto/block by either pressing the icon or F10 function key. In Auto, an arrival detection from the finish beams or arrival remote control will be recorded and an image will be produced. In Block, any arrival signals from the finish beams or arrival remote control will be blocked and you will not record any images.

9. **Stop**, use this icon when a race has finished or if a false start has happened and you need to reset the race. F8 function key will also achieve this.

*Note:* If you accidentally press the stop icon too early, you can undo this and get the race active again with a long-left mouse click on the STOP icon. You will see that the STOP icon will temporarily have a red background and then the race will become active again with the running time counting correctly.



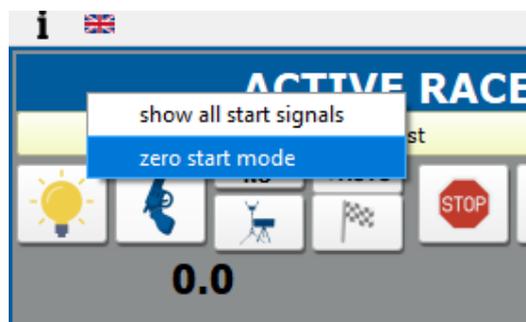
10. **Trash can**, use this icon to delete all recordings of an active race if they were recorded by accident and you do not need them.

11. **Running time scoreboard display**, this button indicates which race should be displayed on a scoreboard. Normally there is only 1 race active, and Argus will automatically send the active race information to a scoreboard (single line or to ViewManager for multiple lines). If the button has a number (which is the running time or arrival time) then this race data is sent to the scoreboard. In Argus you can have multiple races active and by clicking this button you can select which race will be sent to the scoreboard. Only 1 race at a time can be sent to the scoreboard!

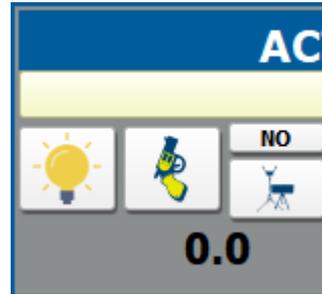
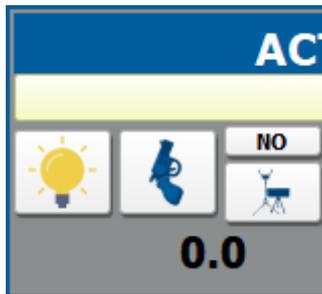
### 7.3 Gun Test

Before an athletics competition, it would be normal to conduct a zero gun test image to validate the timing of the photo finish camera. The Argus software has a gun test mode called 'zero start mode'. This is whereby the camera will automatically record 250 frames before and after a start signal. This means that you do not need someone on the finish line breaking the finish beams or pressing down on the arrival remote control to get an arrival signal, the software will do this for you.

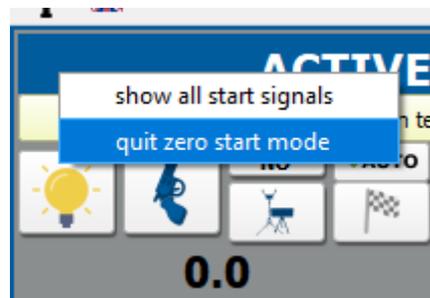
First create a race manually called 'gun test'. Double click on the gun test file in the 'All my races' to open the 'Active Race' controls to the top left of the software window. Click on the light bulb icon to arm the photo finish and you will now see that the lightbulb is yellow and the gun icon is in blue. Right click on the blue gun icon and you will be presented with two options, one being 'zero start mode'.



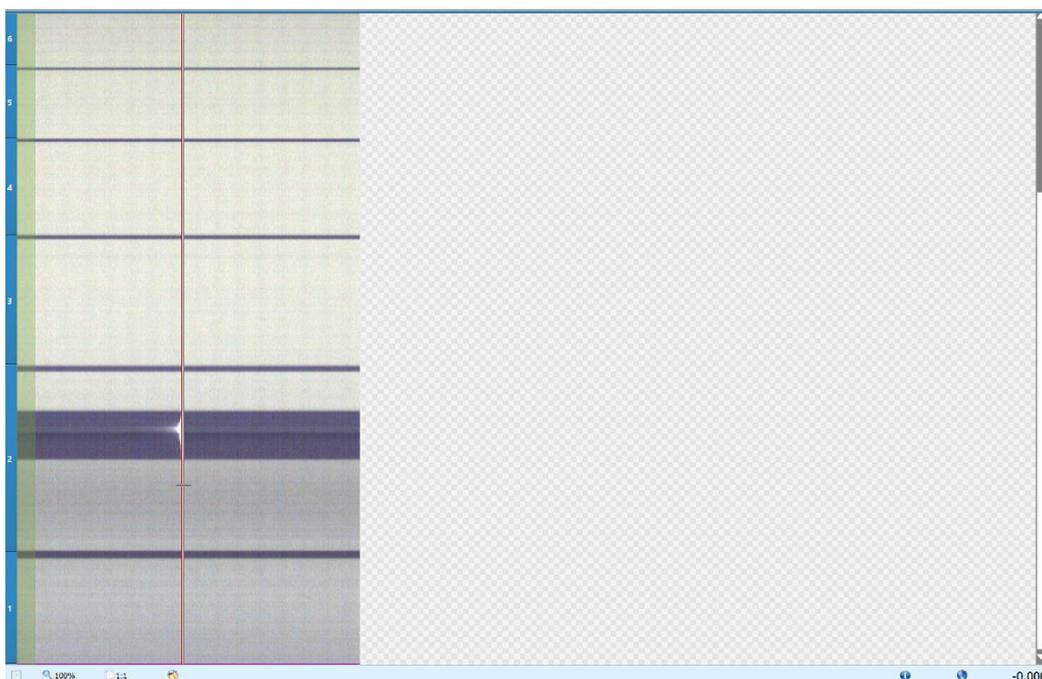
Click on this option to enter the software into gun test mode. You will notice that the blue gun icon will now flash between blue and yellow.



If you entered this mode by mistake, you can right click on the blue/yellow flashing gun icon and select 'quit zero start mode'.



Proceed with the gun test and when a start signal is given, you will see that the software will record arrivals before and after the start signal and you now have a gun test image.



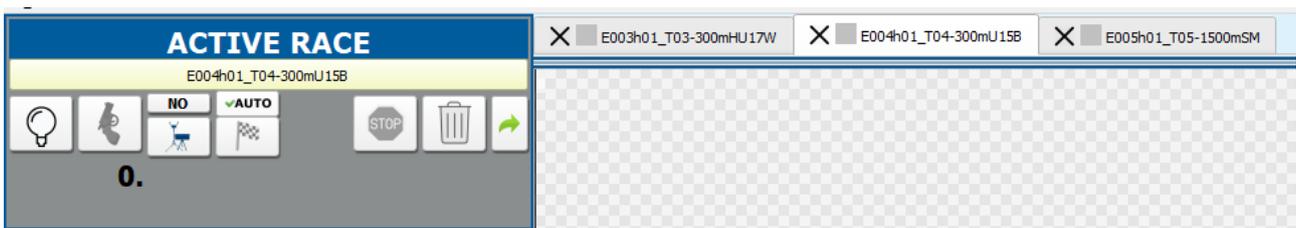
You can move your cursor to the front edge of the flash, and you can read the time to the bottom right of the software.

This will be default to 0.01 accuracy, however if you wish the cursor display time to read to a high accuracy, then left click on it to cycle through the different accuracy options available.

## 7.4 Recording a Race

As previously discussed, when you double click on a race in the 'All my Races' section, you will be presented with the 'Active Race' section, allowing you to control the Argus camera during the recording of a race.

You will also observe that above the photo finish image section there will be a tab with the name of the race you have just selected. You can double click on further races, and you will see that additional tabs will be displayed. The race tab that is highlighted will be the one whereby you can manage with the 'Active Race' controls. This is also confirmed by the text directly underneath the 'Active Race' header, showing you the race that you have selected.



### 7.4.1 Race Colour 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.

-   E004h01\_T04-300mU15B **Grey Box** – this indicates that the race is unarmed (not ready to accept a start signal) and the arrival control is set to 'auto'.
-   E004h01\_T04-300mU15B **Grey Box & Cross Through** – this indicates that the race is unarmed and the arrival control is set to 'block'.
-   E004h01\_T04-300mU15B **Yellow Box** – this indicates that the race is armed, and the arrival control is set to 'auto'.

-  E004h01\_T04-300mU15B **Yellow Box & Cross Through** – this indicates that the race is armed and the arrival control is set to 'block'.
-  E004h01\_T04-300mU15B **Green Box** – this indicates that the race is active/running, and the arrival control is set to 'auto'.
-  E004h01\_T04-300mU15B **Green Box & Cross Through** – this indicates that the race is active/running and the arrival control is set to 'block'.
-  E004h01\_T04-300mU15B **Blue Box** – this indicates that an arrival has been detected and is about to write the image to the software.
-  E004h01\_T04-300mU15B **No Box** – this indicates that the active race has been stopped and no further actions can be performed to this race.

### 7.4.2 Start Signals

Upon the detection of a start signal you will see that:

- The blue gun in the 'Active Race' section will move from a vertical to a horizontal position
- A running time will commence below the gun icon
- A gun sound will be emitted (if this option has been checked in the set up)
- The colour indicator box of the race will turn green
- The manual arrival record chequered flag icon will turn from greyed out to coloured

#### **7.4.2.1 – Resetting a start signal**

There may be circumstances, for example during the false start of a race, whereby you will wish to reset the start signal of a race.

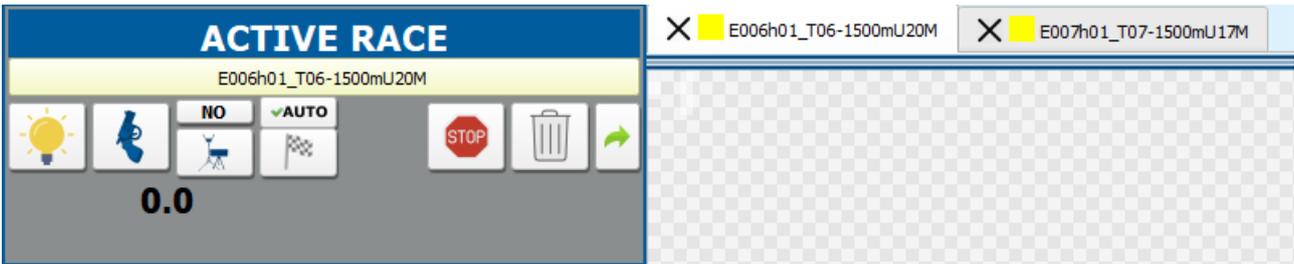
To do this, click on the red stop sign icon and then re-arm the software, by pressing the light blue icon, so you are ready for the next start signal.

#### **7.4.2.2 – Multi race start signal**

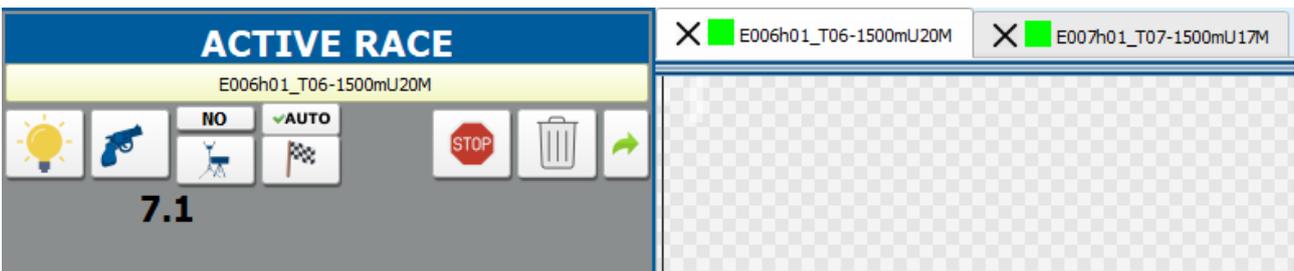
It is possible to give the same start signal to two or more difference races at the same time. This may be helpful in an example whereby you have a 3000m race and a 5000m race starting at the same time.

Double click on the two or more races (from the 'All My Races') that you wish to give the same start signal to. Arm one race and then click on the tab of the remaining races and arm these. You should see that all races have a yellow box colour indicator attributed to them. This means that if a start signal is given, the start signal will be sent to all armed race files and the colour indicator boxes will turn green.

**Before start signal:**



**After start signal:**

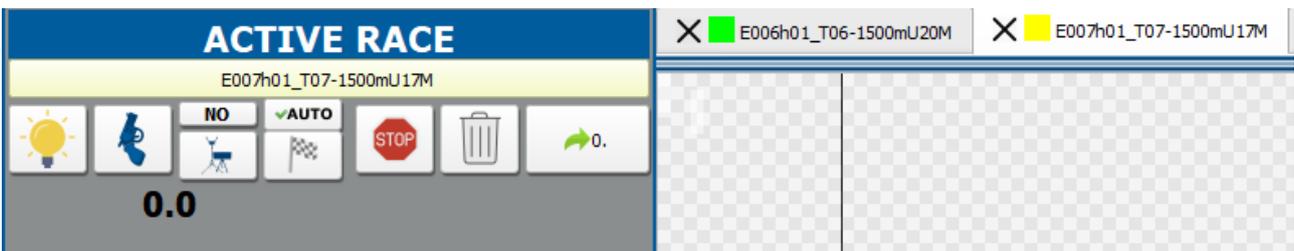


If you need to reset the start signal of a multi race start, you will need to click on to each tab and perform a race reset on each one as previously discussed in 7.4.2.1 -Resetting a start signal.

**7.4.2.3 – Future Race Start**

There may be the scenario whereby you wish to give the start signal to race 2, when race 1 has not been complete yet. This may occur where there is only one participant left to arrive in an endurance race, but he/she is far from the finish line and the participants are ready for the next race.

To do this simply double click and arm race 2 and it will now be ready to accept a start signal. You will notice that the colour indicator box of race 1 is in green (race start given and active) and the box of race 2 is yellow (waiting for start signal).



When a start is given, the box of race 2 will turn green.

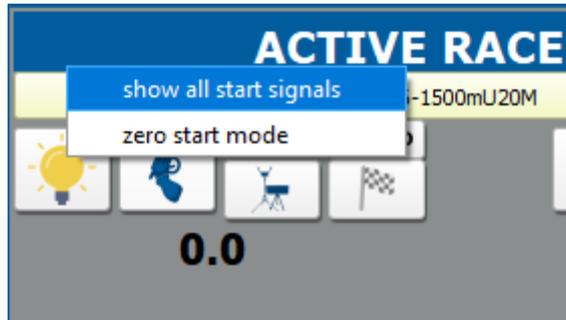
If you are to use this functionality, please make sure you click back to the race 1 tab before the arrival of the last participant, so that you can capture the arrival signal to the correct race.

### 7.4.2.4 – Show all start signals

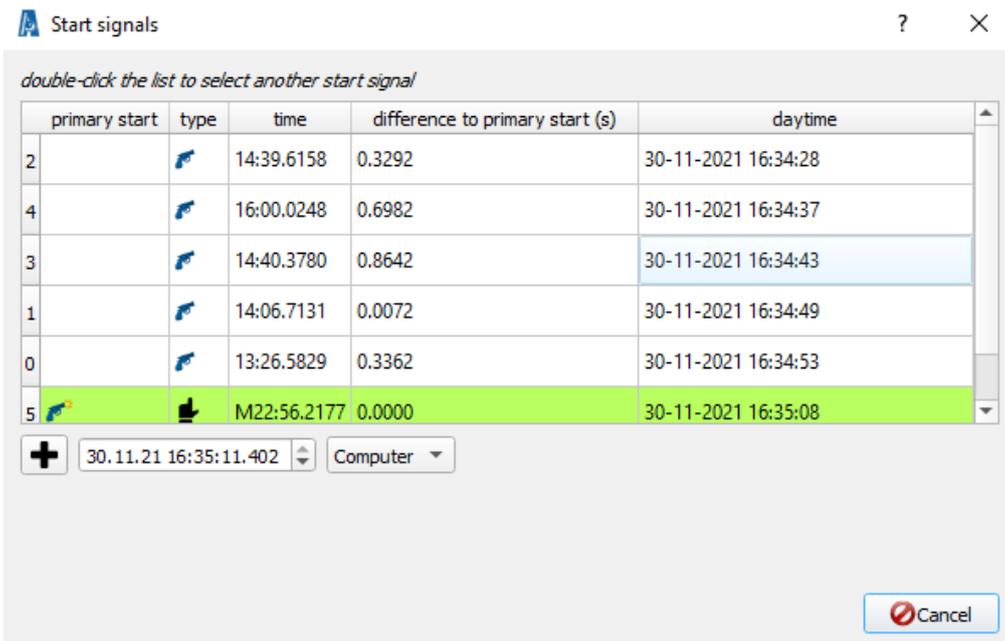
The Argus software captures and stores all the start signals, even if you have not armed the software. It is therefore possible both during a race and after a race, to select a different start signal if so desired. Here we will explain choosing a different start signal during a race, post-race start signal selection will be discussed later.

To access the start signal control window, first you need to have a race that you wish to amend the start signal of either in an armed state or race actively running (yellow or green box).

Right click on the gun icon and choose 'show all start signals'. It is also possible to access the start signals window by a holding left click to the gun icon when the race is in an armed state.



The start signals control window details all the start signals that the Argus software has captured.



The start signal that is being used for the race you have selected is highlighted in green and all other start signal options can be seen before this time.

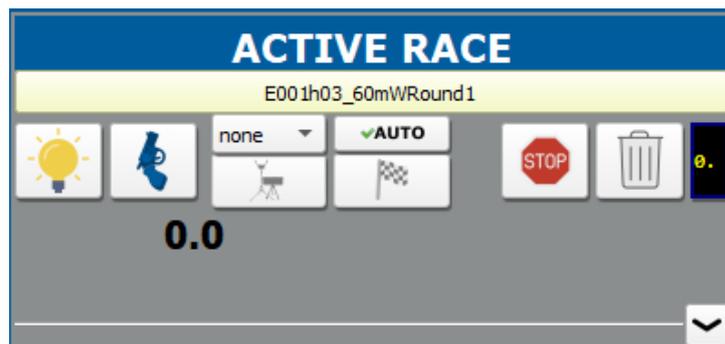
There are three types of start signal that are captured:

- Gun/electronic start 
- Software manual push button start 
- Computer time start 

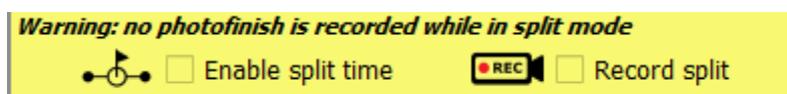
To select another start signal, simply double click on another row and the window will disappear with the running time of that race reverting to the new start signal you have selected.

### 7.4.3 Split Timing Signals

To the bottom right of the 'Active Race' section, you will see a downward arrow icon that will allow you to toggle the split mode window.



When pressed, the downward arrow will now become an upward arrow and it will extend the Active Race section downwards presenting the split timing mode to you.



By default, when you enter this mode, the check boxes will be unchecked, and no recordings will occur if an arrival signal is detected.

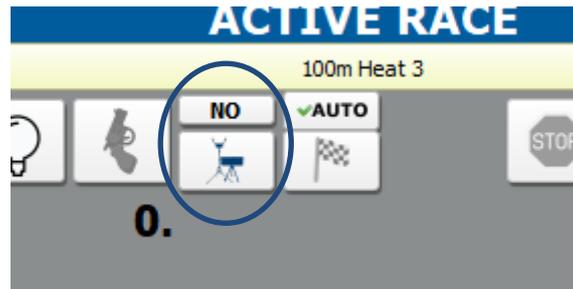
If you wish to take a split time, check the 'Enable split time' box before the athlete arrives at the finish. When they pass, you will notice the running time pauses and a split time will be sent to your scoreboards. If you wish to record the photo finish image of this split arrival, please also check the 'Record split' box.

You can exit the split timing mode by pressing on the upward arrow. This collapses the split timing mode and any arrivals that are detected will create a recording and a finish time for your scoreboards.

### 7.4.4 WindSpeed Signals

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.

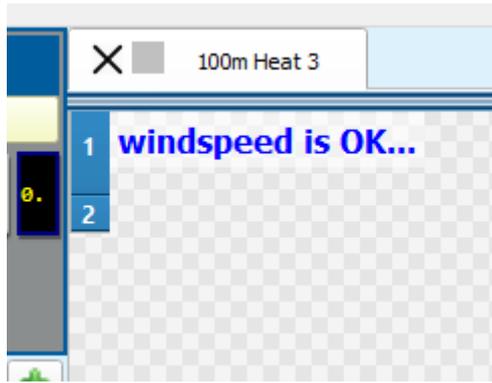
The WindSpeed controls can be found within the 'Active Race' controls of a race.



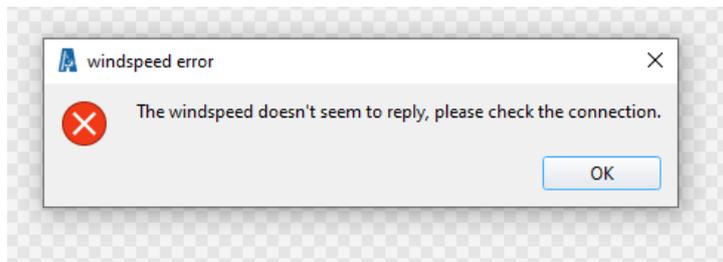
The top smaller button controls the time frame of which you wish the WindSpeed to measure after a race start has been detected. When clicked, this presents a drop-down menu for you to choose your required wind speed. The options are as follows:

- 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 of a period of 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.

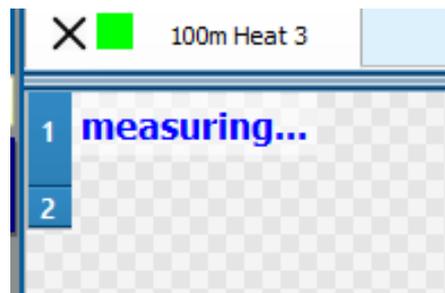
You can use the WindSpeed drop down list when the software is in either idle or an armed state. If you change the WindSpeed measurement setting when the software is in an idle state, when you shift to an armed state, you will get confirmation that the WindSpeed is connected well and ready to start measuring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



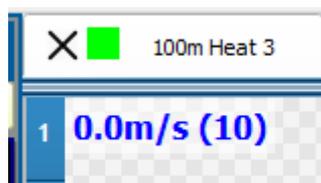
If the WindSpeed is not connected well, you will get a warning message 'The windspeed doesn't seem to reply, please check the connection.' and the software will revert to an idle /unarmed state.

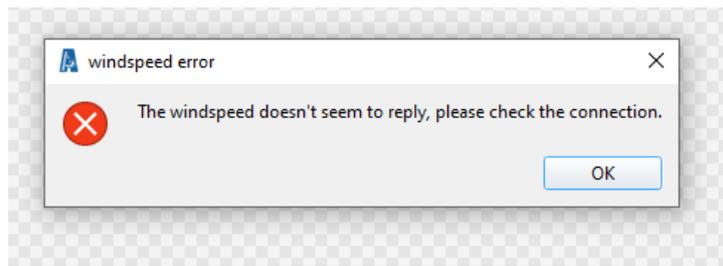


Upon the start of a race where you have indicated that you wish to record a WindSpeed for, the WindSpeed icon in the 'Active Race' will turn to a tornado and the message to the top left of the photo finish image section will change from 'windspeed is OK' to 'measuring...'.



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 memorise the WindSpeed selection you have chosen from the previous race.

### **7.4.5 Arrival Signals**

Arrival signals can be given in various ways to the Argus software;

- Arrival beams at the finish line
- Arrival remote control
- Software arrival

In all cases, when an arrival is detected, you will notice the following events:

1. The running time in the 'Active Race' section has stopped with an official winning time.
2. The chequered flag in the 'Active Race' will briefly go green
3. The race colour indicator in the race tab and 'All My Races' section will turn blue
4. To the right middle of the 'Active Race' a continual running time will be show
5. To the bottom right of the 'Active Race' the time of the most recent arrival signal will be shown.
6. To the bottom left of the 'Active Race' a blue bar will appear indicating the writing of the image to the hard disk.

When the image has finished writing to the hard disk the blue bar disappears and instantly your image will appear on your screen.



### 7.4.5.1 Image Build Up

When you have an arrival detection, your photo finish image will begin to appear on your screen. At the end of the image, you will see a transparent green bar which will allow you to control how the image is immediately displayed when it becomes longer than the screen width.

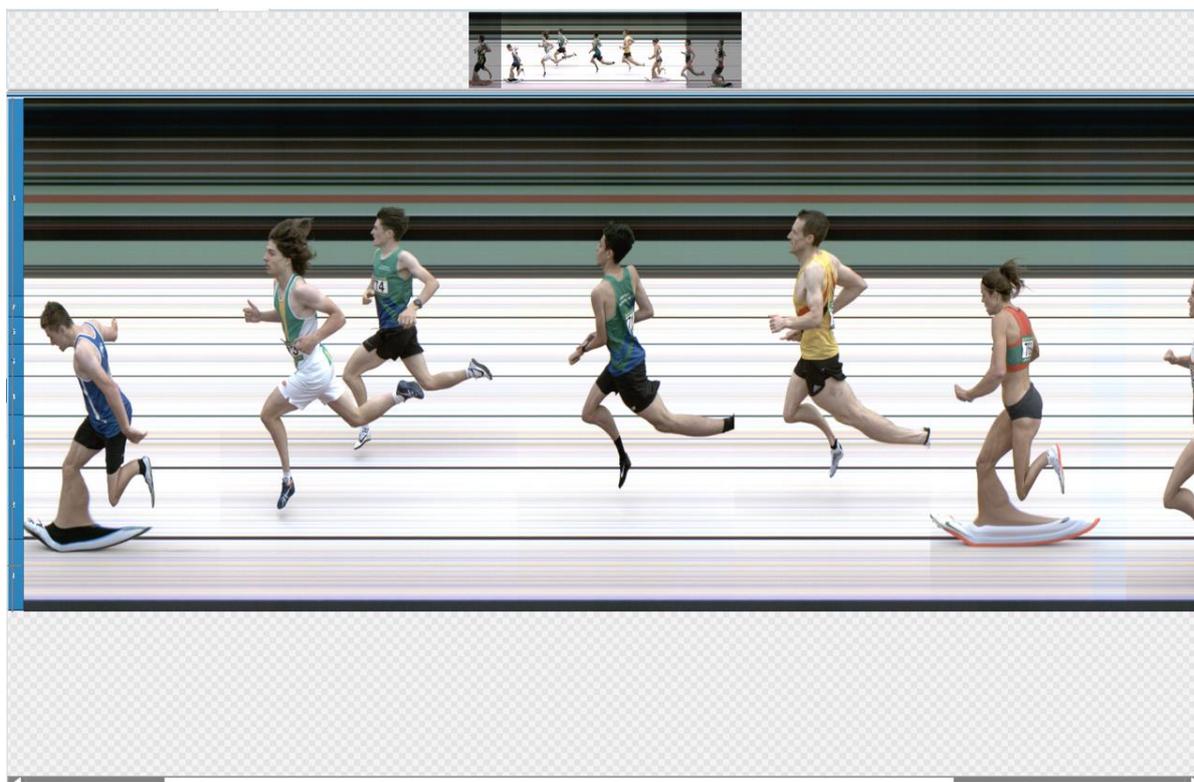


For a sprint race it will be usual that the entire image will fit on the width of the screen, however for endurance races the photo finish image can be very long due to the number of participants and the individual arrivals detected. As the Argus is a live image camera, we need a way to be able to tell the software whether we want to see the new arrival signals live, or if we want to

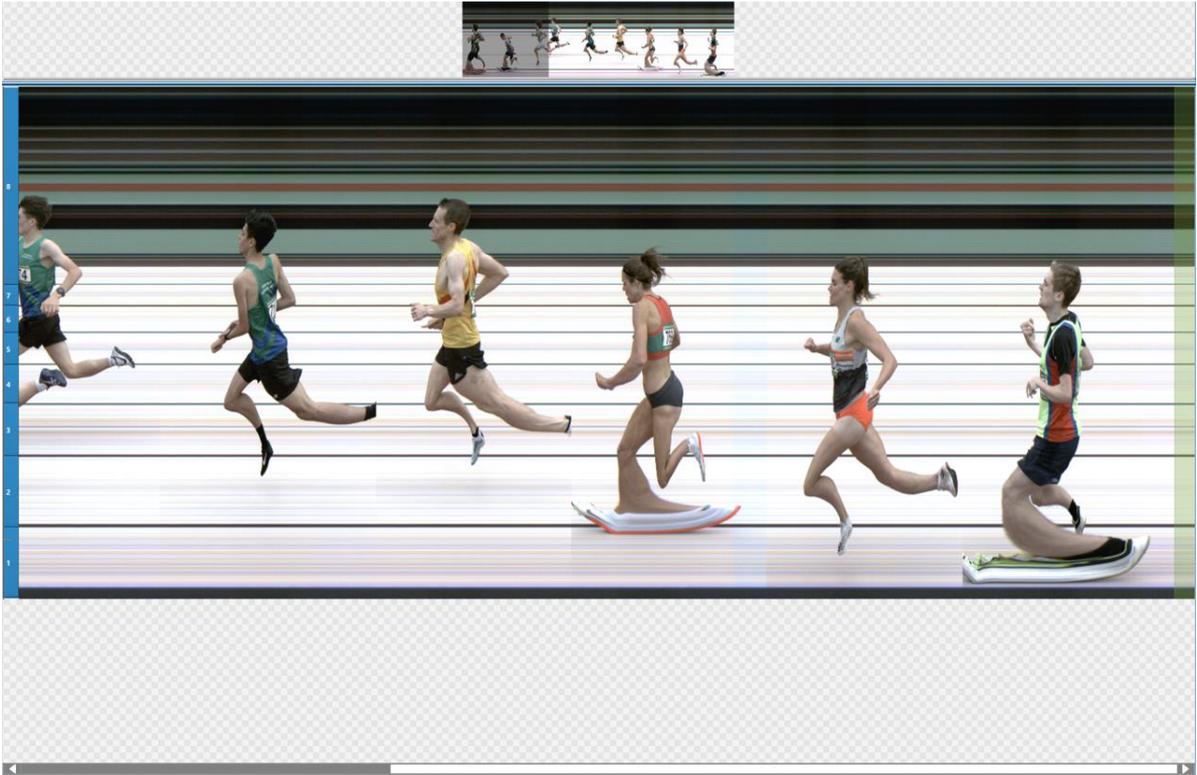
stay on the part of the image you are currently viewing and let the new arrivals build up in the background.

This is a very simple feature, if you see the green bar, any new arrivals will automatically be shown, however if you do not see the green bar, any new arrivals will be added to the end of the image for you to scroll too later.

In the example below, we are timing an 800m race and you can see that we are viewing the photo finish image to the middle of what is available. If we are busy reading the race whilst the race is still going on, we do not want the photo finish image to skip to any new arrival recordings at the end of the image. As we do not see the green bar, any new arrivals will be recorded and processed ready for us to scroll to later when we are finished with this section of the photo finish image.



Using the same image, we have now scrolled to the furthest most point of the photo finish image and the green bar is now visible. Any future arrivals will now immediately be shown, and the rest of the image will be shifted to the left (in this example where athletes are running right to left).



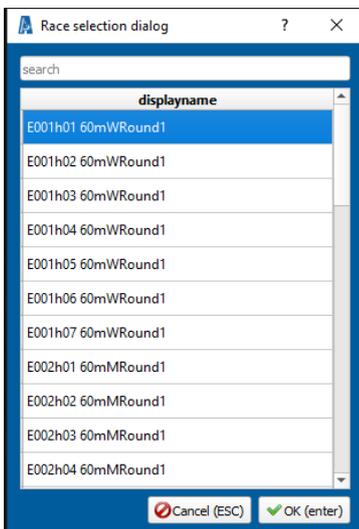
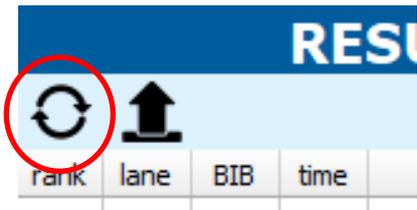
This setting can also be handled by the function 'Scrollbar on new frames' describe on page 32.

## 8. Correcting mistakes

During the operation of photo finish, sometimes mistakes will happen and below we will describe two of the most important mistakes that could be made and how to correct them.

### 8.1 Incorrect race selected.

If you have selected an incorrect race and have a photo finish image on your PC that is saved to incorrect race data, you will wish to assign that photo finish image to another/the correct race. To do this press the refresh icon in the 'Results Table'. This will then give you a list of all the races that you have available, and you then select the race that the photo finish image should be attributed to.



When selecting the correct race, you will be asked, 'Would you like to rename this race to 'xxxxxx\_renamed'? This will be done after closing the race.' Select 'Yes' and you will notice in the All My races section that you will have a file called xxxxxx\_renamed and the original file that you save the image to will now be clear and ready to accept the correct start and finish signals for that race.

### 8.2 Missing arrivals.

*Note: This functionality is only available for the Argus Pro camera.*

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/running. 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. 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.



*Note: Only open the continuous recording mode window when/if you need it. Do not have it constantly opened. It requires a lot of processing power and it is not recommended to be displayed at all times.*

You can find the missing arrivals you need by using the scroll bar to view through the past 20 minutes of recordings. When you have found the missing arrivals frames you require, select them by left mouse clicking at the start of the frames you need and hold and drag until the last frames you need. You will notice the area you have clicks and dragged is highlighted.

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.

## 9. Processing Your Photo Finish Image

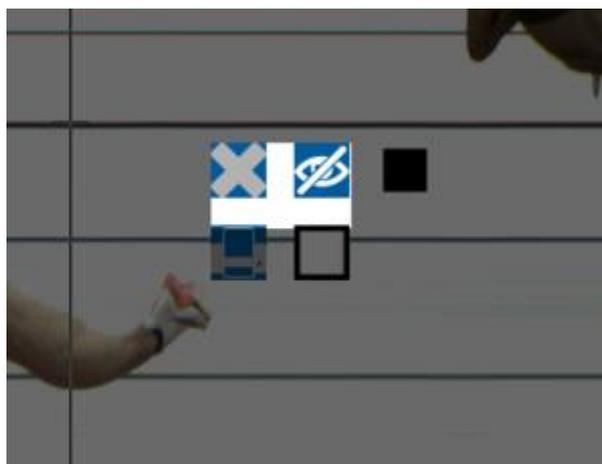
Now that you have recorded your photo finish image, it may be that you wish to make some alterations to optimise the quality before reading your image.

### 9.1 On Image Alterations

When you click, hold and drag a small box with your cursor, the image will darken out and a cross options box will appear to the top left of the box you have created.



Clicking on this box will open further functions allowing you to alter the image.



#### Hidden Frames

By pressing the eye with the cross through icon, you can hide the frames that you have selected with the box you have just created. Unhiding these frames will be discussed later.



### Black & White Calibration

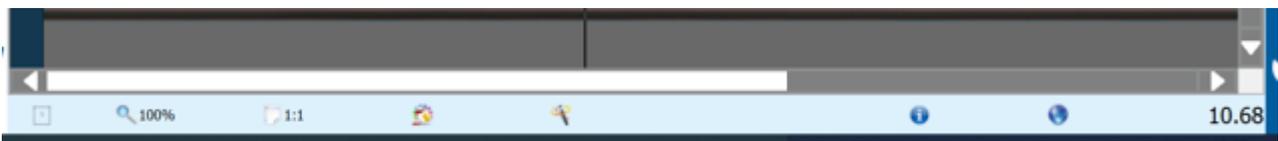
By clicking on either the black or white box you can complete black/white calibration. Be sure to have previously selected a portion of your image that should be either black or white before clicking the corresponding colour calibration. You will notice the image will optimise the colours and these settings are remembered for future races, so you therefore do not need to do this after each race.

### Print

By clicking on the printer icon, you will create a jpeg/png of the box you have created. You will be prompted to save the file on a destination on your PC from which you can open and print if you desire.

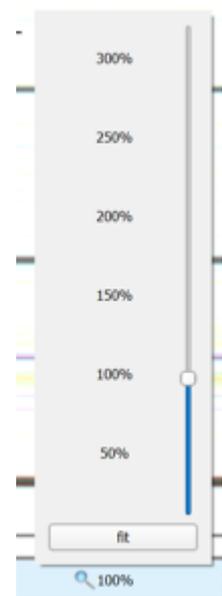
## 9.2 Off Image Alterations

To the bottom of your image, you will see an additional options bar allowing you to make further adjustments.



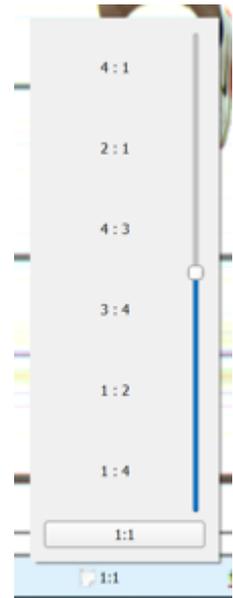
### Zoom

Clicking on the magnifying glass icon will open the zoom options you have available. Select which option suits you and your screen size best. This setting will be memorised for future races so you do not need to keep changing it after each race. This zoom function can also be achieved by pressing and holding the Ctrl button on your keyboard and using the scroll wheel of your mouse.



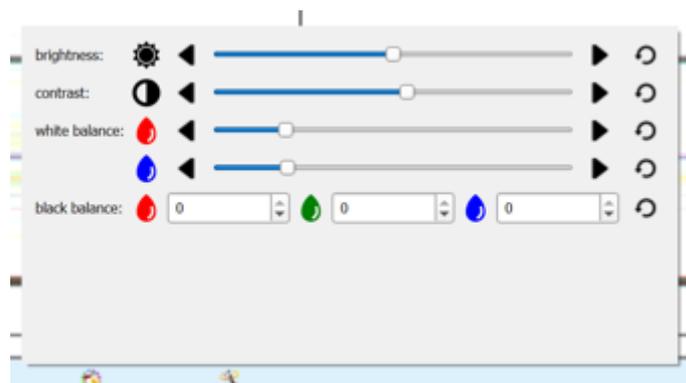
### Image ratio

The image ratio can be managed by clicking on the ratio icon to the right of the zoom icon. This will either 'stretch' or 'squash' your image. Select which option suits you and your screen size best. This setting will be memorised for future races, so you do not need to keep changing it after each race.



### Colour Controls

To the right of the image ratio icon is the colour control icon.

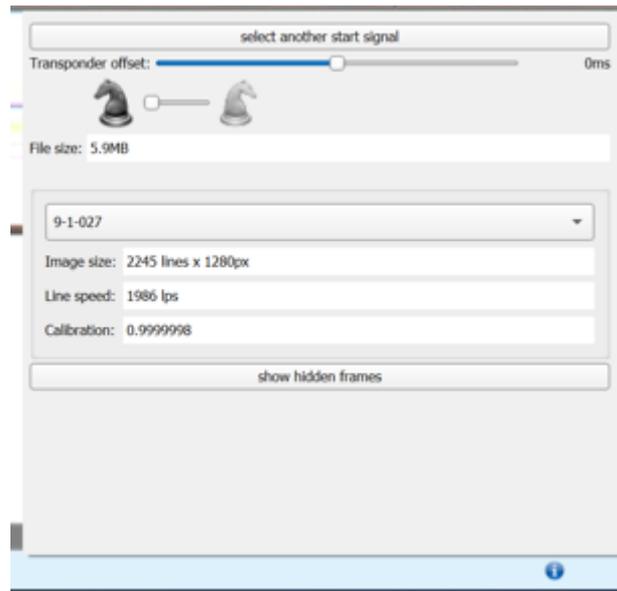


Here you can adjust the brightness and contrast of the image and these settings will be memorised for future races.

You can also manually alter the white and black colour balance, however we recommend doing this via the On Image Alterations, as described previously.

### Image Information

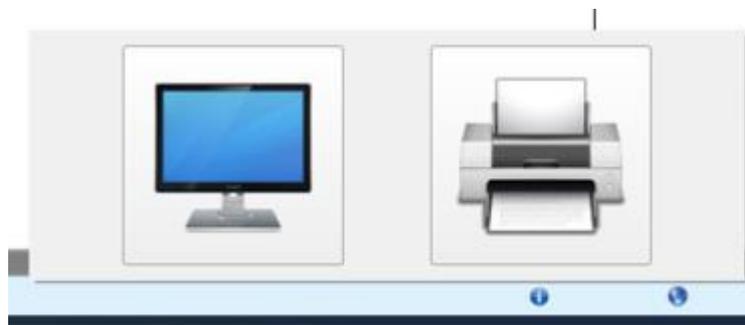
To the right of the bar there is an 'I' icon which when clicked, will present further information in relation to the image.



From here you can select different start signals, flip the image, see the information about the file size and display hidden frames if you have previously hidden them in the On Image Alterations feature.

### Image Presentation

Clicking on the globe icon to the far right of the options bar opens the image presentation choices.



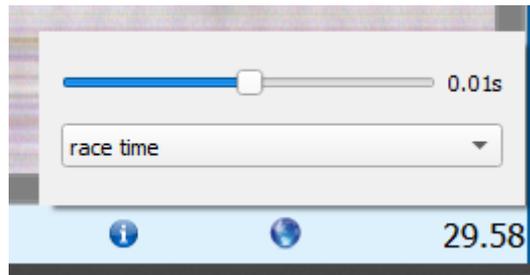
If you click on the monitor icon, then the software goes into full screen mode and your entire screen will be used to display only the image. You can use the keyboard left and right buttons to move across the image and to exit, press the Esc key on your keyboard.

For the printer icon, in version 2.26 this currently has no functionality.

### Display Time

The furthest right of the bottom options bar shows the race time in relation to where your cursor is on the image. If you wish the display time to read to a higher accuracy, then left click and it will cycle through the different accuracy options possible or right click to use a slider and choose which timing accuracy you wish to display.

If you click on the time, then it works like a toggle button to change the requested timing accuracy.



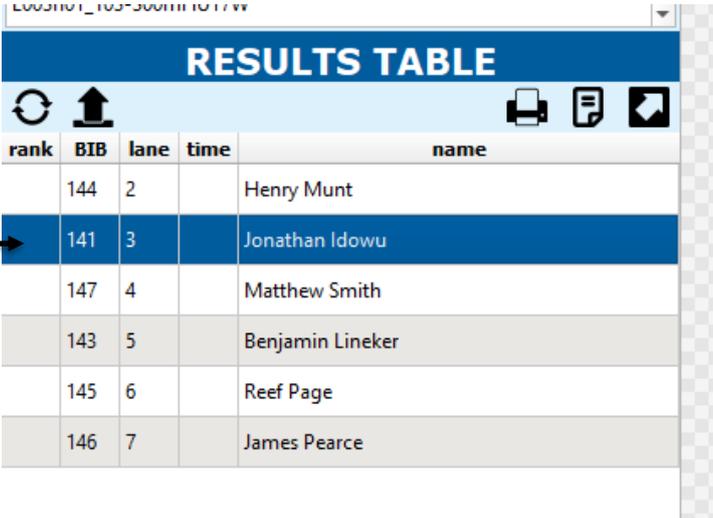
## 10. Reading Your Photo Finish Image

When recording a race with the Argus software linked to an external race management software, you will be presented with a list of participants to the bottom left of the screen in the section called 'Results Table'. This is where you will see the result of the race populated when you begin to read a photo finish image. However, before we start adding results we can begin to add results labels for those athletes that either DNS (did not start), DNF (did not finish) or DQ (disqualified). You can do this either before a race has started, during a race, after a race has finished but before you read the finishing positions, or after a race has finished and after you have read the finishing positions, the choice is yours.

### 10.1 Adding DNS/DNF/DQ

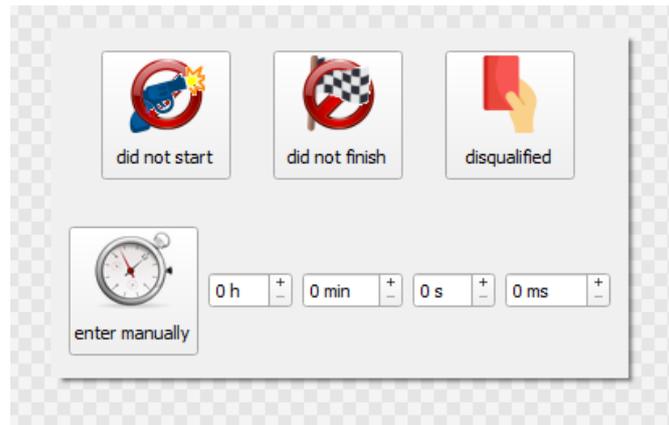
To do this, press and hold the Ctrl key and left mouse click within the rank box of the athlete in question. In the example below, we wish to add a result to Jonathan Idowu.

Ctrl + left mouse click here →



rank	BIB	lane	time	name
144	2			Henry Munt
141	3			Jonathan Idowu
147	4			Matthew Smith
143	5			Benjamin Lineker
145	6			Reef Page
146	7			James Pearce

You will be shown a window whereby you can select a result of either 'did not start', 'did not finish' or 'disqualified'. You will also notice there is the possibility of entering a manual result of this competitor if so desired.



Once you have added the results you need, in this case a DNS, the window will disappear, and the results table will be populated with the results you have selected.

RESULTS TABLE				
rank	BIB	lane	time	name
	141	3	DNS	Jonathan Idowu
	144	2		Henry Munt
	147	4		Matthew Smith
	143	5		Benjamin Lineker
	145	6		Reef Page
	146	7		James Pearce

If you have made a mistake and selected either the wrong athlete or the incorrect result label, you can delete this by left clicking anywhere on the result row (this will highlight it in dark blue) and pressing delete on your keyboard.

### 10.2 Reading a Race via Lanes

The aim of reading a photo finish image is to fill in the Results Table with the correct time and position in relation to the lane and/or bib number of an athlete. When reading a photo finish image, it is more efficient to read in time order (fastest to slowest), however if you wish, with the Argus software you can read times of athletes in the wrong time order and the results table will automatically sort the times/positions correctly.

There are two ways in which we can read a photo finish image depending on how we wish to identify the athlete, by either their lane or their ID. We can use either way for sprint races and via the ID way for endurance race, however it is significantly more effective to use the lane identification process for those races where the athlete finishes in the same lane in which they

started (100m-400m) and use the bib identification process for those races where the athlete breaks from their lane during the race (600m+).

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 that only practice and time can assist with, 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!

To read a photo finish 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.



Use a combination of 1 Ctrl + 1 Shift key

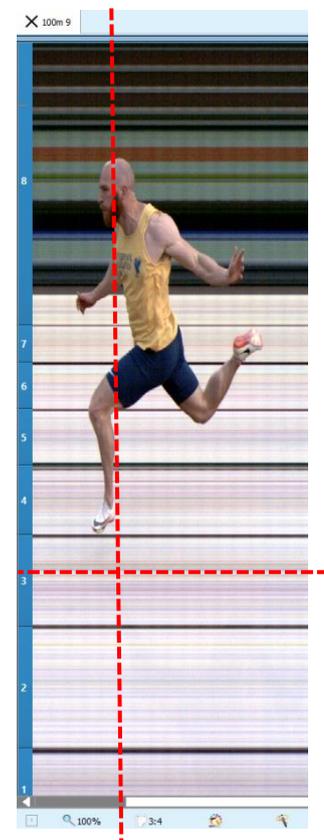
Line up the vertical line with the torso\* of the athlete that you wish to obtain a time for and then move the horizontal line so that it is within the lane (in relation to your lane markers that you have set up) that the athlete is in. When you have the cursor in the correct position, whilst still holding 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 + mouse click to produce a result with time and lane. To remove the horizontal line, press Ctrl + Shift.

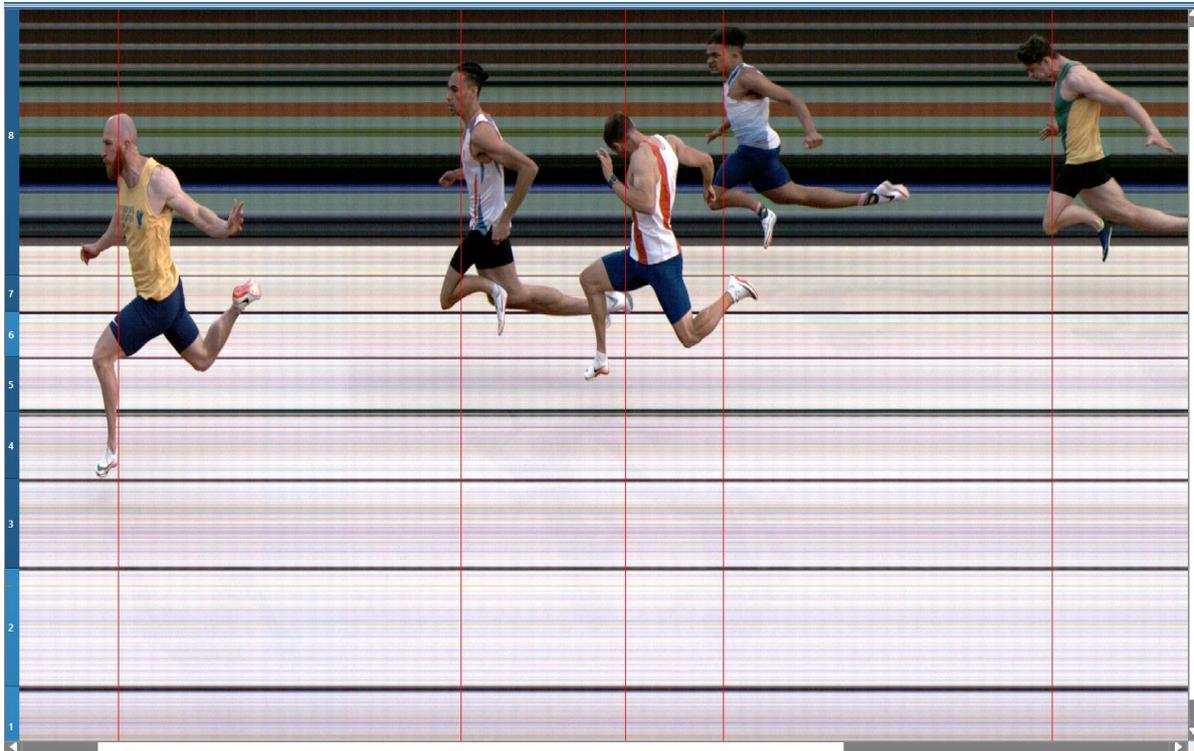
If we revert back to our earlier image, the cross-hair cursor should be in the following position for the first athlete:

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

*\* Under Rules 19.1.1 and 19.1.2 of the Technical Rules, the time shall be taken to the moment at which any part of the body of an athlete (i.e. torso, as distinguished from the head, neck, arms, legs, hands or feet) reaches the vertical plane of the nearer edge of the finish line.*



Once you have read all the athletes within your image, your results table will be full and your image will look like the following:



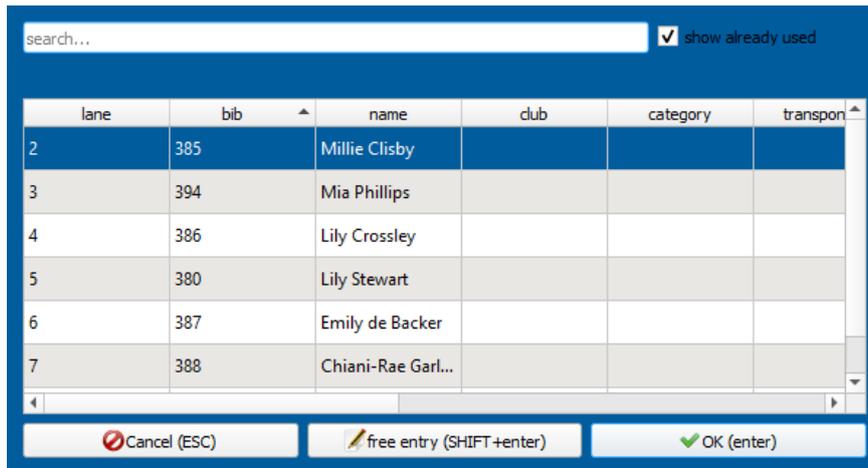
Each athlete should have their own red timeline and the lane markers, to the left of the image, that have been selected will now be in a darker blue colour.

### **10.3 Reading a Race via Bib ID**

For races of 600m and above (300m indoors) whereby the athletes break after the start and therefore do not finish in an allocated lane, we need to identify the athletes on the image by their Bib number.

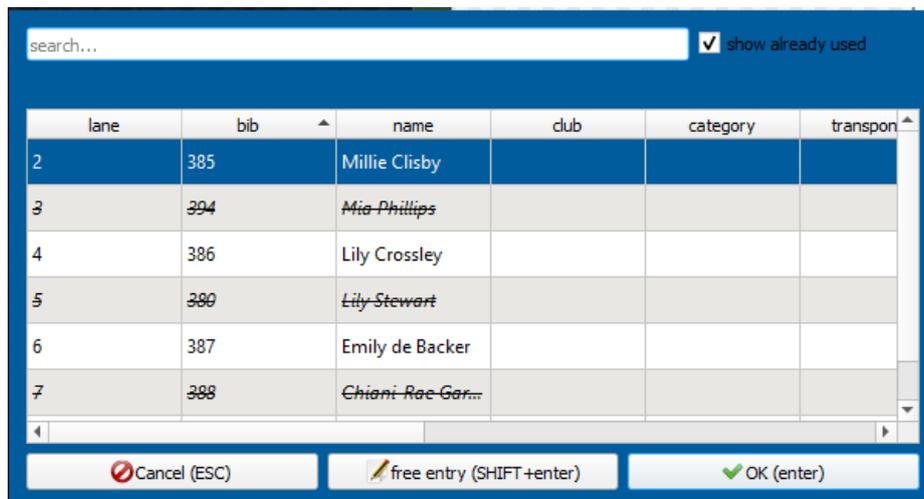
To do this, bring the vertical line of the cursor to the first athlete you wish to read and whilst pressing and holding the Ctrl button, left mouse click.

You will be presented with a window to the bottom right of the photo finish image section, displaying the participants of that race.



Simply double click on the athlete you wish to assign your vertical timeline to and create their result. Repeat this process for every athlete within the image to create a full results table.

To the top right of this window, you have the option to toggle (using the check box) between showing athletes already selected (these will be crossed out) or not showing them and therefore showing only the athletes available for future timeline reads.



Showing athletes that have already been used (crossed out)

**RECAP:**

**To read a race using lanes, press and hold Ctrl + Shift and left mouse click**

**To read a race using bib ID, press and hold Ctrl and left mouse click**

### 10.4 Timeline Adjustment

If you have created a result of an athlete, but the timeline is not quiet where you want it to be, instead of deleting and re-reading the result, you can simply adjust the timeline of that result.

To change the timeline of an athlete, click on their result line within the Results section and then press Ctrl+ left or right arrow on your keyboard. You will notice the red timeline on the photo finish image will move left or right, and the result time of the athlete will also change if necessary.

### 10.5 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.

You have the option of zooming and stretching the image either via the zoom/ratio functions to the bottom left of the photo finish image, or using Ctrl + mouse wheel scroll, however there is also an additional way to assist.

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 Ctrl + 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 you will notice the Image Eye Zoom will show permanently, when click alt again and it will change back to normal view.



## 10.6 Exporting data

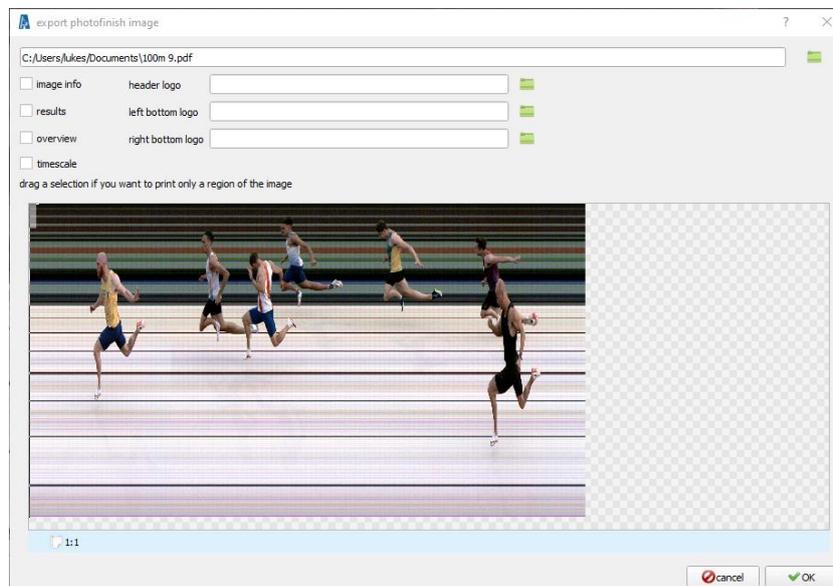
When you have completed reading your race and wish to send the results to the external race management software, please press the upload results icon within the 'Results Table' top icon bar.



## 11. Image Export

You may have a fantastic close race that you wish to distribute, but you wish to have a better-quality image than just taking a screenshot of your screen. The Argus software allows you to export your image either as a PDF or PNG.

Clicking on the printer icon within the Results Table header bar will display the 'export photofinish image' window.



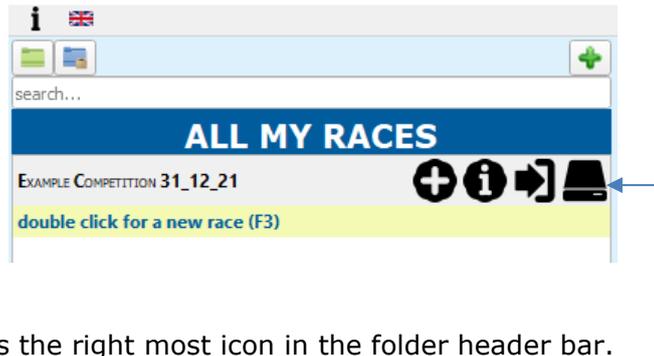
Here you can decide the destination where you wish to save the image to on your PC (this is also where you can decide if the file will be a PDF or PNG), add logos to either the header or bottom left/right of the image and whether you wish to include additional information alongside your exported image such as results, an image overview, and the timescale.

If you only wish to export a certain part of your image, please drag a selection that you wish to export from the image shown in this window.

## 12. Post Competition Folder Archiving

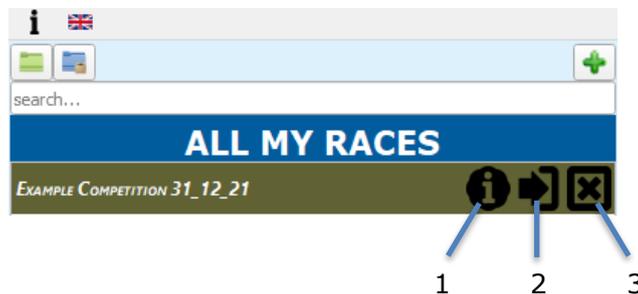
After you have completed all your races within your competition, you can archive the folder of the competition so that the 'All My Races' section is clear and ready to create a new folder for a new competition.

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.



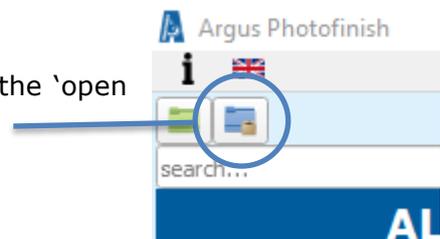
To archive a folder, press the right most icon in the folder header bar.

The folder header bar will now turn brown and will show 3 icons, when you hover the cursor over it.



1. Show info – this will open an additional window to allow you to change the name of the folder.
2. Export all files to a compressed archive on an external hard disk – this will allow you to decide a place within your PC whereby you can create a ZIP file of this competition's files.
3. Close this archive folder – this will remove the folder from view within the 'All My Races' section.

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\xxx\photofinish\_files\archive where xxx is the name of the PC user and delete the folder that you do not require.

## 13. Software Keyboard Shortcuts

Key	Function
<b>F4</b>	Scroll through active races
<b>F5</b>	Set race ready
<b>F6</b>	Manually start race
<b>F7</b>	Set an arrival
<b>F8</b>	Stop race
<b>F10</b>	Toggle block arrivals
<b>F12</b>	Manual wind measurement
<b>O</b>	Toggle overview
<b>Home</b>	Scroll to the beginning of the photofinish image
<b>End</b>	Scroll to the end of the photofinish image
<b>Arrows left/right</b>	Scroll in the photofinish image
<b>Shift + arrows left/right</b>	Fast scrolling in the photofinish image
<b>Shift + mouse wheel</b>	Fast scrolling in the photofinish image
<b>Ctrl + mouse click</b>	Set a result in the photofinish image
<b>Ctrl + arrows left/right</b>	Move the result line one step (after selecting a result)
<b>Ctrl + Shift + mouse click</b>	Set a result by lane in the photofinish image
<b>Short double press Shift</b>	Set permanent horizontal result by lane line (press Shift again to hide result line)
<b>Ctrl + mouse wheel</b>	Zoom photofinish image
<b>Alt</b>	Activate image eye
<b>Alt + mouse wheel</b>	Zoom image eye
<b>Short double pres Alt</b>	Open permanent image eye window (press Alt again to hide image eye)
<b>Alt + mouse wheel + click</b>	Zoom image eye, move mouse down/up after click to open 2nd image eye to compare close finish
<b>Ctrl + Shift + mouse wheel</b>	Control Video ID frames in steps

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