

# OPTIc



The screenshot displays the ALGE OPTIc software interface. The top menu bar includes 'File', 'Race', 'Work', 'Image Evaluation', 'Image', 'System', 'Show', 'Window', and 'Help'. The main window is divided into several sections:

- Race information:** Meeting: Austrian Championship 1998; City of event: Feldkirch / Gengen; Discipline: Run 1; Completion number: 0; Race number: 1; Distance: 100 m; Wind: -1.5 m/s\*\*.
- Table:** A table with columns: Rank, Time, Bib, Lane, Name, Surname, Club, Age. The 6th row is highlighted in red.
- Work area:** Includes 'Insert' and 'Delete' buttons.
- Image window:** Shows a photo of a runner on a track with a time overlay of 10.84.

Rank	Time	Bib	Lane	Name	Surname	Club	Age
1	11.46	1	1	Holer	Walter	Feldkirch	73
2	11.54	2	2	Melchert	Richard	Linz	75
3	11.23	3	3	Lunert	Andreas	Wien	69
4	11.27	4	4	Haller	Thomas	Greiz	68
5	11.29	5	5	Prohaska	Kurt	Innsbruck	75
6	10.84	6	6	Sykes	Geat	Aachen	71
7	11.50	7	7	Oberschedel	Hans	Kaechenbera	77
8	11.31	8	8				

# ALGE

**TIMING**

Internet: <http://www.alge-timing.com>  
e-mail: [office@alge-timing.com](mailto:office@alge-timing.com)

English

Distribution Box OCD1

- II (B)
- 12 Socket for photocell (C)
- 13 Socket data out for display board
- 14 Socket data out for display board
- 15 Socket data out for RS 232
- 16 Socket data out for RS 485
- 17 Banana socket for start
- 18 Device-switch
- 19 Socket for IEEE 1394 (connection to PC, 3 identical sockets)
- 20 Socket for mains plug (88 to 265 VAC)
- 21 Fuse 4, T 1A (primary fuse)
- 22 External power supply 20 to 28 VAC (e.g. 24 Volt battery)
- 23 Connection to camera 1
- 24 Fuse 1, T 1,6A (for camera 1)
- 25 Connection to camera 2 (if you have a system with 2 cameras)
- 26 Fuse 2, T 1,6A (for camera 2, if you have a system with two cameras)
- 27 Fuse 3, T 2A (secondary fuse)



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As defined by the progress we subject to change the state of technology.

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## **1. INTRODUCTION**

### **1.1. System Components**

#### **PC requirements:**

- ☞ Intel Pentium III resp. Athlon or faster.
- ☞ Windows 2000 Service Pack 2 or Windows NT (Service Pack 3 or higher)
- ☞ 128 MB RAM
- ☞ Hard disk with min. 10 GB (the more hard disk space, the longer the recording time)
- ☞ CD-drive
- ☞ Keyboard for PC
- ☞ Mouse for PC
- ☞ Graphic card X-VGA (min. 8 MB RAM)
- ☞ Monitor with min. 1024 x 768 resolution and true color
- ☞ free PCI slot for IEEE 1394 interface or integrated IEEE 1394 interface
- ☞ Color printer to print the pictures and result lists (color laser or ink jet printer)

The OPTIc includes the following parts:

- ☞ Color Line Scan Camera OCC1
- ☞ OPTI Distribution Box OCD1
- ☞ PCI Board with IEEE 1394 interface
- ☞ Zoom Objective 12,5 -75 mm (C-Mount)
- ☞ Adapter for C-Mount objective
- ☞ Telescopic Sight with cross hair on camera
- ☞ OPTIc Software for Windows 95B resp. Windows NT
- ☞ Camera cable 10 m
- ☞ Cable for IEEE 1394
- ☞ Start-Stop-Simulator-Adapter 087—5

Options for the OPTIc:

- ☞ Startmicrophone SM8
- ☞ Speech Amplifier SV4/SM
- ☞ 2 x Headset Q34
- ☞ Photocell RLS1n (reach: 1 to 25 m)
- ☞ Photocell RLS1nd (reach: up to 150 m)
- ☞ Three-Fold-Photocell RLS3c with tripod
- ☞ Handswitch 020-02
- ☞ Display Board GAZ4
- ☞ Cable Reel KT 300
- ☞ Motor Zoom 16 - 160 mm / F1,8 - 1400, controlled by PC (focus, zoom and iris)
- ☞ Weather shield for camera
- ☞ Additional second Line Scan Camera OCC1 (starting in autumn 2000)
- ☞ Viewer + Optic (Nikon Bayonet)
- ☞ Camera tripod for OPTI
- ☞ Anemometer Windmaster 2000+
- ☞ Cable Reel with 60 m cable for Anemometer
- ☞ Adapter for Nikon Objective lenses
- ☞ Windspeed on Display Board (WSGA)
- ☞ Tripod with decline

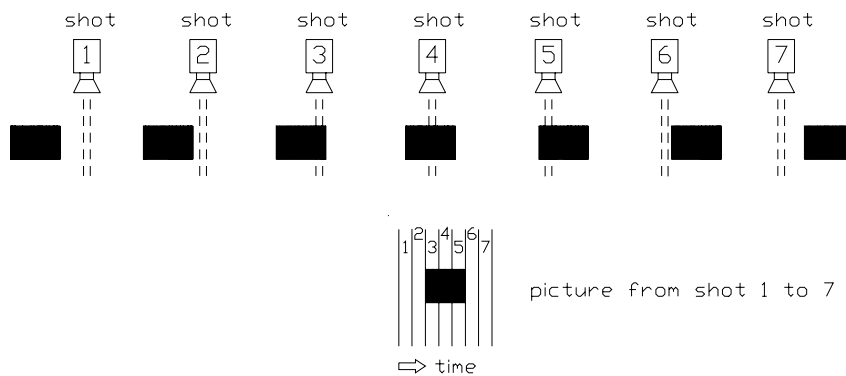
**1.2. Functions**

The ALGE OPTic system is an electronic photo timing system with integrated evaluation software. High timing precision is guaranteed by a temperature compensated quartz oscillator (TCXO). The OPTic works with a PC under Windows NT and Windows 95B . The system is very easy to operate due to the Windows surface.

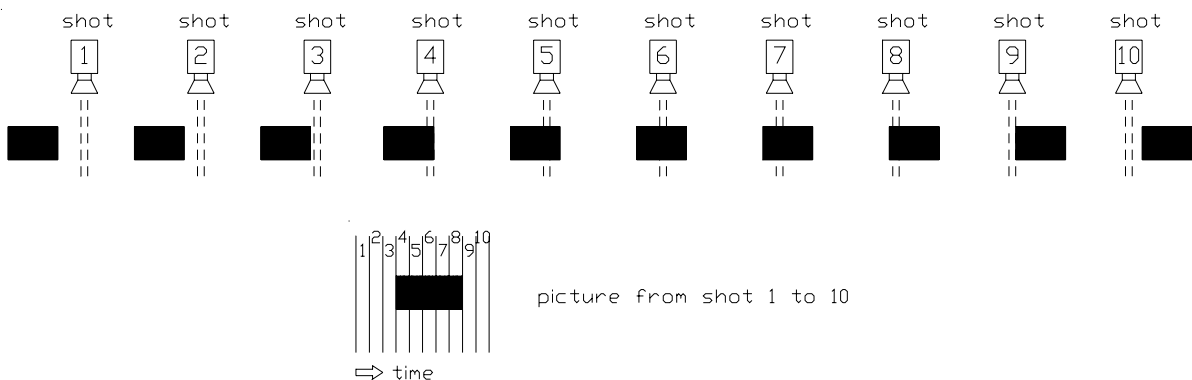
The Line Scan Camera (CCD image sensor) scans every movement on the finish line and records it on the hard disk of the PC. It is possible to scan up to 2000 lines per second.

A few seconds after you recorded a finish arrival it shows the picture on the monitor of the computer. You can read the times from the picture up to precision of 1/2000 seconds. Each time will be integrated immediately into the evaluation software. For close finish arrivals you have a zoom function.

The following example will show you how a picture is recorded. If you use a scan rate of 1/1000 seconds it means that the finish line will be scanned 1000 times per second.



The next example shows the same object, but now crossing the finish line with a slower speed and same scan rate of 1/1000. The shape of the recorded picture will depend on the speed of the picture and scan rate. Therefore it is very important to record with the correct scan rate to get the realistic shape of the picture. The picture below shows that object stretched, if using the same scan rate at a slower speed. Of course the object will be scanned more often under such circumstances.



For the ALGE OPTic you do not need to develop pictures thank to the modern digital system. This will help you save money (film and development costs) and avoids the use of chemicals. The recorded picture is stored on the hard disk (bitmap format) thus making it possible to print it at any time with a printer.

### **1.3. System Components and its Functions**

*Personal Computer (PC):*

PC to control, evaluate and store the pictures.

*S-VGA Color Monitor:*

Monitor with min. 17" and XGA resolution (1024 x 768 pixel).

*Keyboard:*

To operate the PC

*Mouse:*

To operate the PC

*PCI-Board with IEEE 1394 Interface:*

To transfer the pictures in real time into the PC you need a fast data transmission. The IEEE 1394 (Firewire®) is a very fast and future orientated interface. The data transfer rate reaches at the moment up to 400 Mbit/s.

*OPTI Distribution Box OCD1:*

The OCD1 is a high precision timer (with TCXO quartz oscillator). In the OCD1 it mixes the pictures with its time. Further you can connect all external timing devices at the OCD1 (e.g. Startmicrophone, Photocell, Display Board).

The OCD1 also has an integrated power supply (88 – 265 V / 50 – 60 Hz / 60 W) which supplies the OCD1, camera, photocell, etc.

*OPTI Line Scan Camera OCC1:*

Color line scan camera (3-line sensor with RGB) that allows you to scan the finish line up to 2000 times per second. Supported resolutions are under Windows NT: 1365, 1024, 768 and 625 pixel (High resolution 1356 Pixel). The camera is connected with the OCD1 with the 10 m standard cable (alternative up to 100 m cable) that is supplied by the OCC1.

*Objective for the Camera:*

standard lens supplied is a zoom objective 12.5 – 75 mm, 1 : 1.2 (C-Mount).

If needed it is also possible to use other fix as zoom objective lenses. ALGE supplies an adapter for Nikon objectives. Alternatively ALGE also supplies a Motor Zoom 16 - 160 mm / F1,8 – 1400 with remote control from the PC (focus, zoom and iris).

### **1.4. Sports that Require a Photofinish System**

<i>Athletic (Track):</i>	<ul style="list-style-type: none"><li>• sprint</li><li>• long distance races</li></ul>		
<i>Cycling:</i>	<ul style="list-style-type: none"><li>• track cycling</li><li>• road races</li></ul>	<i>Motorcycling:</i>	<ul style="list-style-type: none"><li>• autocross</li><li>• road races</li><li>• motors</li><li>• speedway</li></ul>
<i>Rowing:</i>	all events	<i>Speed Skating:</i>	all events
<i>Canoe:</i>	all events	<i>Short Track:</i>	all events
<i>Horse Races:</i>	<ul style="list-style-type: none"><li>• gallop</li><li>• trotter</li></ul>	<i>Cross Country:</i>	sprint, relay
<i>Dog Races:</i>	all events	<i>Biathlon:</i>	sprint, relay
<i>Roller Blade:</i>	all events	<i>Snowboarding:</i>	boarder-cross
<i>Car Racing:</i>	<ul style="list-style-type: none"><li>• road races</li></ul>		

## **2. INSTALLATION OF THE OPTIc**

### **2.1. Power Supply**

PC, Monitor and Printer:

For the power supply. Read the handbook of PC, monitor, and printer. On request **ALGE** can also deliver a USP (emergency power supply) for the complete system (except printer).

OPTI Distribution Box OCD1:

A power supply (105 to 230 V / 50 to 60 Hz) is installed in the OCD1. This supplies the OCD1, the camera, and peripheral devices. If you use a USP it is necessary to supply the OCD1 from the USP.

### **2.2. Installing the PCI-Card IEEE 1394 into your PC**

The PCI card must be installed in your computer by your computer dealer or by your **ALGE** representative.

**ALGE** has now surrounded to the new IEEE 1394 (OHCI) standard. This standard will be assisted from the new operating system (Windows 2000, Windows 98, Windows ME).

Some PC's (especially laptops) have already mounted this interface.

We recommend the operation system Windows 2000 because this one is very solid.

- Switch the PC off
- Take the case cover of the PC off, so you can see the PCI sockets.
- Remove the cover of the PCI card that you want to use.
- Plug the card in the PCI slot.
- Screw the PCI card to the case.
- Put the case cover back on the PC.
- Switch the PC on.
- Continue like described on 2.4 resp. 2.5

### **2.3. Installing the Software for Windows NT/2000**

If you want install Windows NT you must prepare the hardware for Windows NT. You need the right IEEE 1394 card and also the camera and the Distribution-Box have to be prepared for the operating system.

Camera OCC1: Please check if the camera has a sign on the bottom for a high resolution quality.

Distribution-Box OCD1: Please check if the distribution-box has a sign on the bottom that it is compatible with Windows NT.

### 2.3.1. Installing the IEEE 1394 drover

- 1) Switch the PC on (Windows NT).
- 2) Put the **ALGE-OPTic** CD into the disk drive.
- 3) "Install Manager" starts automatically, IF NOT: "Autorun.exe".
- 4) Choose OPTic.



- 5) Choose "Install the FireWire Driver from CD".
- 6) Click "Next".

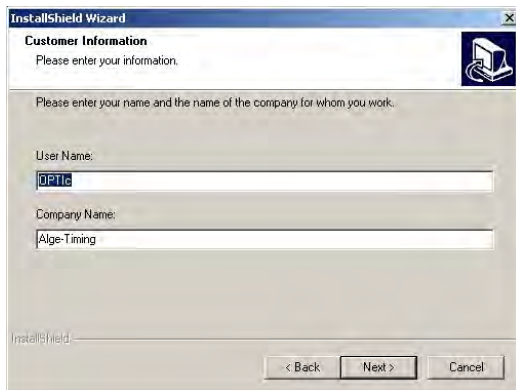


- 7) Click "Yes".

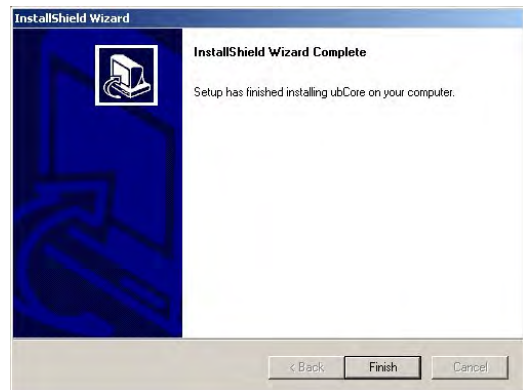




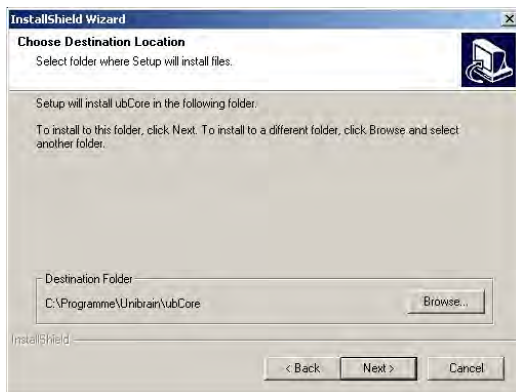
8) Click "Next"



12) Click "Finish"



9) Click "Next"



13) Click "Finish"



10) Click "Next"



11) Click "Next"



## **2.4. Installing the software for Windows 2000 (OHCI-IEEE 1394 card)**

If you want install Windows 2000 the hardware will have to be prepared for it.  
An OHCI compatible card must be mounted.

Camera OCC1: Please check if there is a tip on the bottom of the camera that the camera is high resolution.

Distribution Box OCD1: Please check if there is a tip on the bottom of the distribution box that the distribution box is compatible with Windows 2000/NT.

While starting the operating system the driver will be installed automatically.

### **2.4.1. Installing the OPTI device driver**

- 1) Start the PC (Windows 2000)
- 2) Put the **ALGE** OPTI-c CD into the disk drive.
- 3) "Install Manager" start s automatically; IF NOT: "Autorun.exe"
- 4) Choose OPTIc
- 5) Install the OPTIc software (see chapter 2.4.3.). The driver will be installed automatically into the program directory (presetting: c:\programme\optic-ohci)
- 6) Put in the distribution box and switch on. The operating system knows automatically that a new device is connected to the IEEE 1394 interface and it will ask for a suitable device driver. Give now the program directory where the driver is.



- 7) Click on "Next"



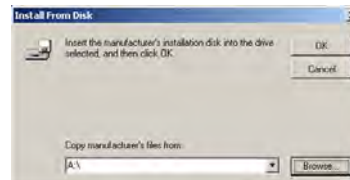
- 8) Click on "Next"



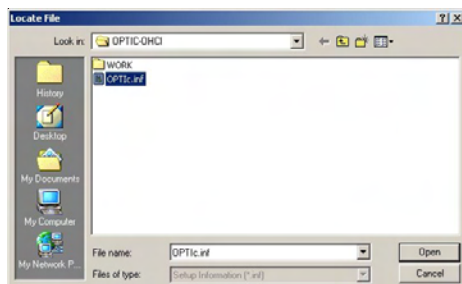
- 9) Click on "Next"



10) Click on "Have Disk"



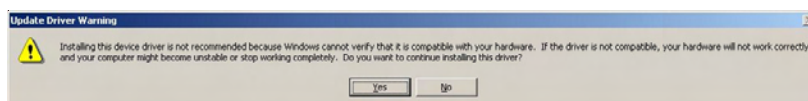
11) Click on "Browse"



12) Open in the program directory from OPTIC-OHCI the file: "OPTIc1394.inf."



13) Click on "OK"



14) Click on "YES"



15) Click on "Next"



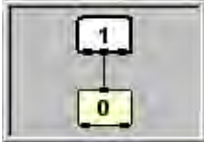
16) Click on "Next"



17) Click on "Finish"

2.4.2.1. Test the PCI-Card IEEE 1394

Start the test software Start/Program/Unibrain FireAPI/Bus Viewer (busview.exe). The bus viewer has to show two nodes if the OCD is connected to the PC and switched on. This program has to start without any error-message.



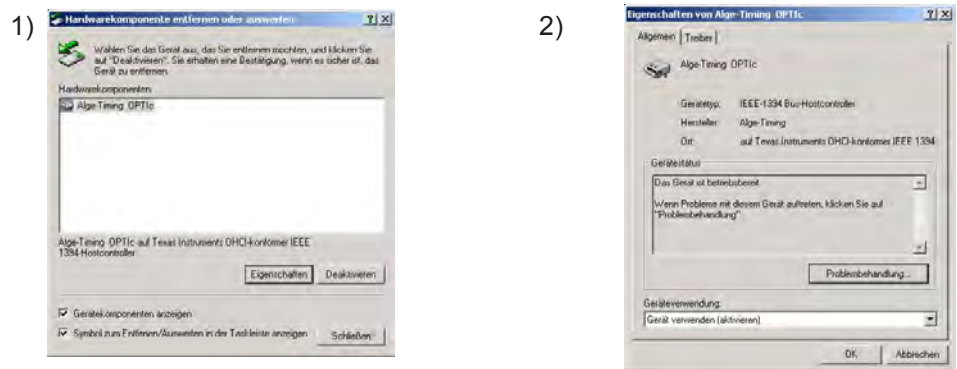
To close the bus viewer press the right mouse-button and "Exit".

2.4.2.2. Test the PCI-card IEEE 1394 (OHCI)

In the task border you will find following picture:



Double click the arrow you will see the following picture:



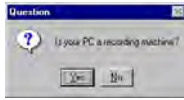
Here you can check if the driver is installed. Click on "feature" you can check if the driver will work.

**2.3.3. Installation of the OPTic-Software**

- 1) Start Windows Explorer
- 2) Insert into the program folder of the disk drive
- 3) Double-click the program folder "OPTic-NT"
- 4) Double-click "Setup.exe"
- 5) Welcome Message: press "Next"
- 6) Choose the program folder and press "Next"



- 7) Click "Next"



- 8) Click "Yes" if you have the OPTIc hardware installed  
"No" if you want to work with the demonstration software



- 9) Choose your language and click "Next"



- 10) Click "Finish"

OPTIc software is now completely installed. Before you start the OPTIc program you must connect the Distribution Box OCD1 and the camera OCC1 and switch the Distribution Box on. Now you can start the OPTIc software. The program must show the message "Camera 1 found".

#### **2.3.4. Test Pictures**

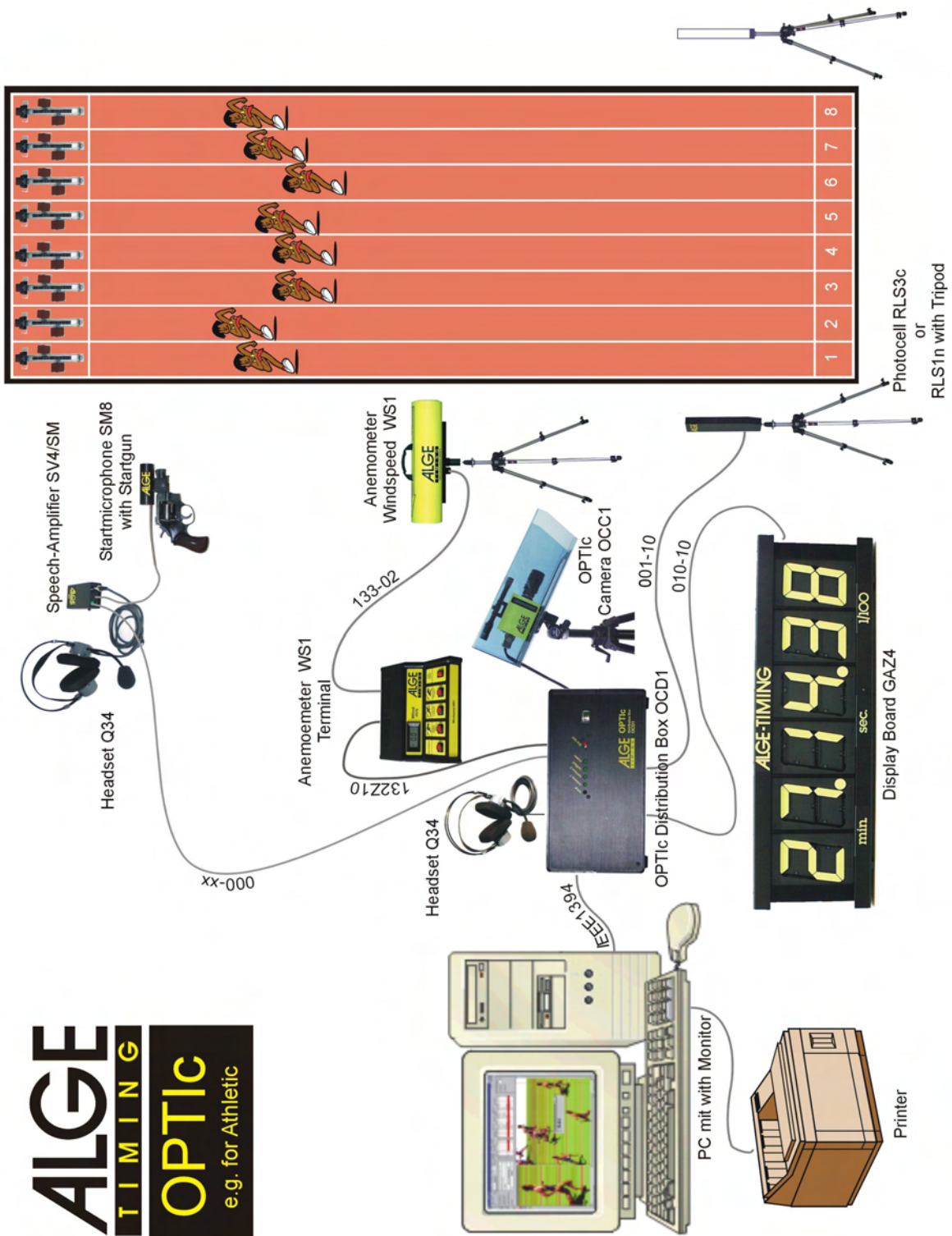
The pictures are not automatically installed with the software. If you want to have the test pictures on your PC it is necessary to copy them from the CD-ROM to your PC (e.g. with Microsoft Explorer). You will find the test pictures in the following directory: OPTIc\work\  
We sorted the test pictures by sports in different directories.

#### **2.3.5. Software for White Balance**

On your ALGE CD-ROM you will find in the root "OPTIc\whitebalance" a file called "syspal.exe". This file you can copy into the OPTIc directory of your PC. When you double click "syspal.exe" it will open a small program that helps you to make the white balance for the camera.

**2.4. Cabling of the System**

The closer the camera is to the PC, the easier is the adjustment of the camera.



### 3. COMPONENTS OF THE OPTIc SYSTEM

#### 3.1. Line Scan Camera OCC1



The OPTIc camera OCC1 is a Line Scan Camera, this means it does not make full pictures like a usual camera, but it scans the finish line. This has the advantage of giving one picture which includes in each line (vertical) the time. If the speed of the object is adjusted correct with the line scan rate it shows a realistic picture.

If the speed of the scanned object is too fast, it will compress the picture.

If the speed of the scanned object is too slow, it will stretch the picture.

The OCC1 camera reads the line in the three basic colors (RGB). This basic colors must be congruent, otherwise the picture will become blurred. The adjustment for the congruent colors is the camera adjustment.

Button <B/W> for switching between black/white or color. Black/white is mainly used to adjust the finish line.

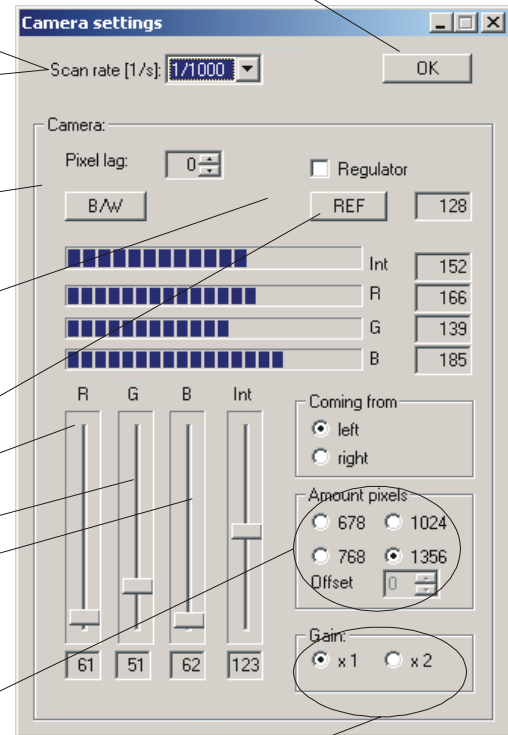
When you have the camera adjusted you should press <REF> (reference) to store the light condition as reference. If you change now into the recording mode it will always tell you the difference of the light conditions in %.

To adjust the colors: R=red G=green B=blue  
The value of 63 means that no color is boosted. The smaller the value, the more you boost the color.

The brightness can be corrected with the slide <INT> (electronic boosting). We recommend to leave the booster at a medium value. This guarantees you that you can manipulate the brightness in both directions. If you go to the upper end of the slide, it will interference. Resolution-setting and the horizontal adjustment (Offset).

If you have bad light conditions you can double herewith the intensification.

Automatic Light regulator on/off



Power Supply  
20 to 28 VDC

Connection for  
Motorzoom

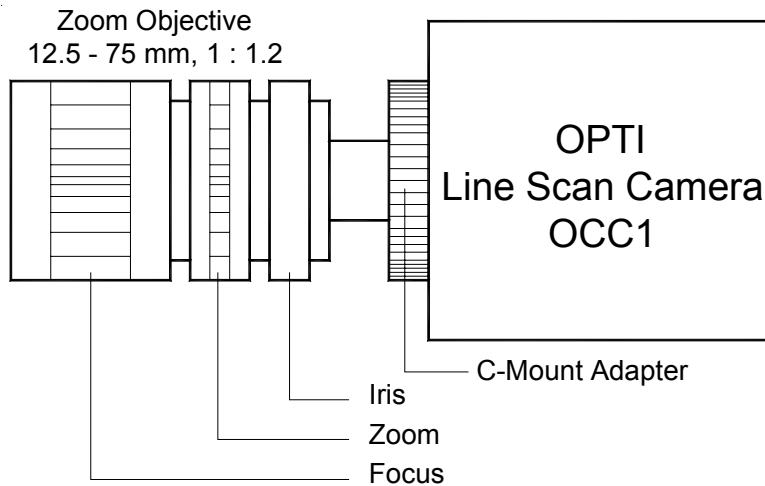
Fuse T1.6 A

LED for camera error  
LED for camera selftest

Connection Cable to  
Distribution Box OCD1



Zoom-Objective:



The camera has a C-mount zoom objective 12.5 – 75 mm. C-mount objectives have the advantage of very good light transmission.

For this camera you can use any C-mount objective with 2/3 or 1 inch.

It is possible to use Nikon objectives when using the correct lens adapter..

Together with a Nikon objective you can also use a “Through the Lens Viewer”. The “Through the Lens Viewer” makes it much easier to adjust the camera, since you have a viewer on the camera. The “Through the Lens Viewer” makes it easier to focus the lens.

The **ALGE** camera OCC1 has a telescopic sight. The sight gives you the possibility of adjusting to the finish line approximately. The exact adjustment must be done on the screen.

**Weather protection for the camera:**

**ALGE** offers an optional weather protection for the camera. The transparent weather protection case is ideal to work with the OPTIc. The weather protection case is not made for permanent outdoor use (if you leave the camera permanently outdoors).

**Tripod for camera:**

**ALGE** offers an optional tripod for the camera. The head of the tripod is ideal for adjusting the camera. It is possible to move the head in all directions with three knobs. The tripod has a maximum height of 1.8 m.





**Motorzoom for the camera:**

ALGE offers a motorzoom-lens. With the motorzoom you can operate the adjustment by remote control from the PC. You will have a favourable effect if the PC is placed far from the camera.



Instead of the standard lens you install the motorzoom on the backside of the camera. There you will find the planned connection



Operation of the motorzoom: see point 5.1.6.

**3.2. Distribution Box OCD1**

The Distribution Box OCD1 is the heart of the OPTIc. It has the following parts integrated.

- Power Supply for OCD1, two cameras and periphery devices (e.g. photocells)
- Timer with high precision temperature compensated quartz TCXO
- Picture processing unit that adds the synchronized time to the picture data
- Interface for PC (IEEE 1394)

The rules for athletic (track) include a timing system check every four years. Since the quartz is integrated in the OCD1 it is only necessary to give the OCD1 to your **ALGE** dealer. The rest of the system need not be checked (camera, PC, etc.).

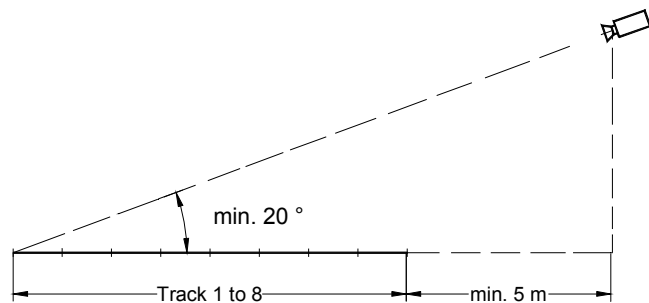
- 1 Error control light
- 2 Camera 1 control light (LED)
- 3 Camera 2 control light (LED)
- 4 Self test control light (LED)
- 5 Power control light (LED)
- 6 Push button for line test
- 7 Meter for power and line test
- 8 Volume for headset
- 9 Socket for Headset
- 10 Socket for photocell (A)
- 11 Socket for photocell (B)
- 12 Socket for photocell (C)
- 13 Socket data out for display board
- 14 Socket data out for display board
- 15 Socket data out for RS 232
- 16 Socket data out for RS 485
- 17 Banana socket for start
- 18 Device-switch
- 19 Socket for IEEE 1394 (connection to PC, 3 identical sockets)
- 20 Socket for mains plug (88 to 265 VAC)
- 21 Fuse 4, T 1A (primary fuse)
- 22 External power supply 20 to 28 VAC (e.g. 24 Volt battery)
- 23 Connection to camera 1
- 24 Fuse 1, T 1,6A (for camera 1)
- 25 Connection to camera 2 (if you have a system with 2 cameras)
- 26 Fuse 2, T 1,6A (for camera 2, if you have a system with two cameras)
- 27 Fuse 3, T 2A (secondary fuse)



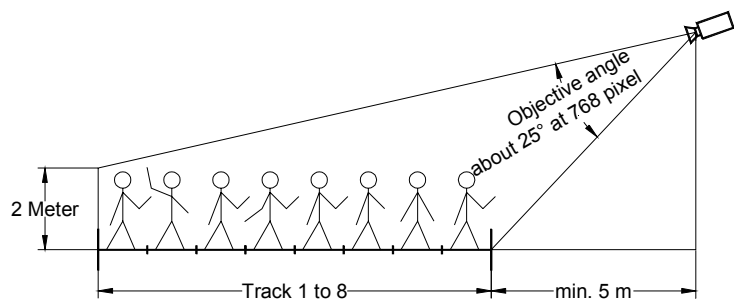
#### 4. ADJUSTMENT OF THE LINE SCAN CAMERA OCC1

Positioning of the Line Scan Camera:

The camera must be placed exactly in the plane of the finish line. The distance between the camera and the track depends on the amount of lanes and the overall width of the track. The camera should have an angle of 20° to the track at the farthest distance.



A good, leveled, not shaking base is necessary to set up the tripod of the camera. A fixed platform with a fixed tripod helps to speed up the camera set up and also makes it easier.



The drawing and tables are made for a camera adjustment of 768 pixel. If you use more pixel of your camera it will increase the recording angle. If you use less pixels it will reduce the recording angle.



The following table tells you which distance the camera needs for a track stadium with 6 or 8 lanes. For a good camera position, this means a good angle to see the all athletes, you need to follow the instructions below:

- ☞ never use a lower angle than 20° from the track with the most distance to the camera (see picture on the page before).
- ☞ all lanes must be covered by the lens (you must see all lanes and an athlete on the outside lane on the picture).

The following graphs are only valid for the objective supplied by ALGE (12,5 -75 mm, 1:1,2) and if you use the camera with 768 pixels.

“yes” in the graph means that the camera position with the shown horizontal and vertical distance is good.

“no” in the graph means that the camera is not in at good horizontal or vertical distance. You cannot show all lanes or you have a very flat angle.

A “?” in the graph means that it will be difficult to show all 6 or 8 lanes in the picture (the angle of 25° might be too small).

A “W” in the graph means, that you will be a little bit below the recommended angle of 20° from the outside lane to the camera.

Stadium with 6 lanes:

horizontal a

vertical b	<b>6 tracks</b>	<b>5 m</b>	<b>6 m</b>	<b>7 m</b>	<b>8 m</b>	<b>9 m</b>
	<b>5 m</b>	yes (?)	yes	yes (W)	no	no
	<b>6 m</b>	yes (?)	yes	yes	yes	yes
	<b>7 m</b>	yes (??)	yes (?)	yes	yes	yes
	<b>8 m</b>	yes (?)	yes (?)	yes	yes	yes

Stadium with 8 lanes:

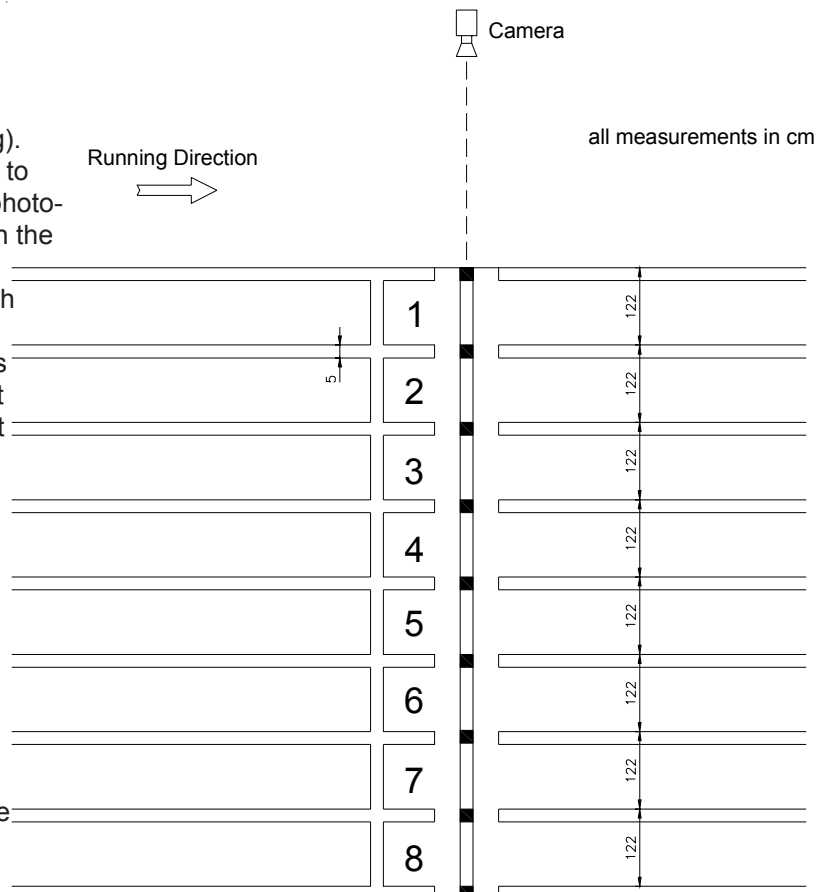
horizontal a

vertical b	<b>8 tracks</b>	<b>6 m</b>	<b>7 m</b>	<b>8 m</b>	<b>9 m</b>	<b>9 m</b>
	<b>6 m</b>	yes (??)	yes(?/W)	no	no	no
	<b>7 m</b>	no	yes (?)	yes	yes	yes (W)
	<b>8 m</b>	no	yes (?)	yes	yes	yes
	<b>9 m</b>	no	yes (?)	yes	yes	yes

Finish Line of the Athletic Track:

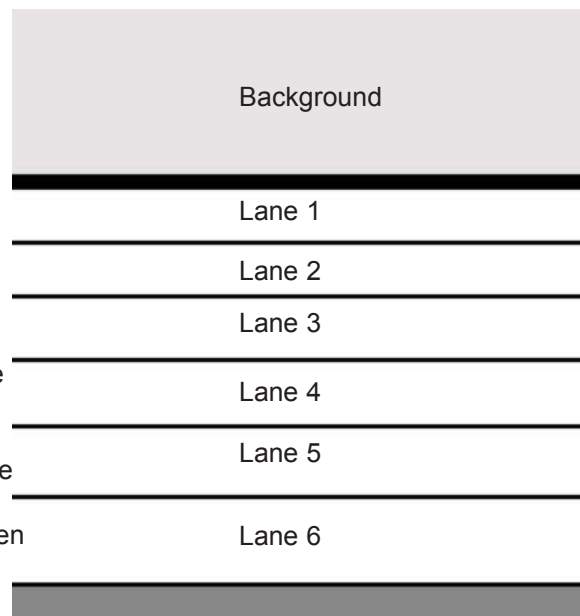
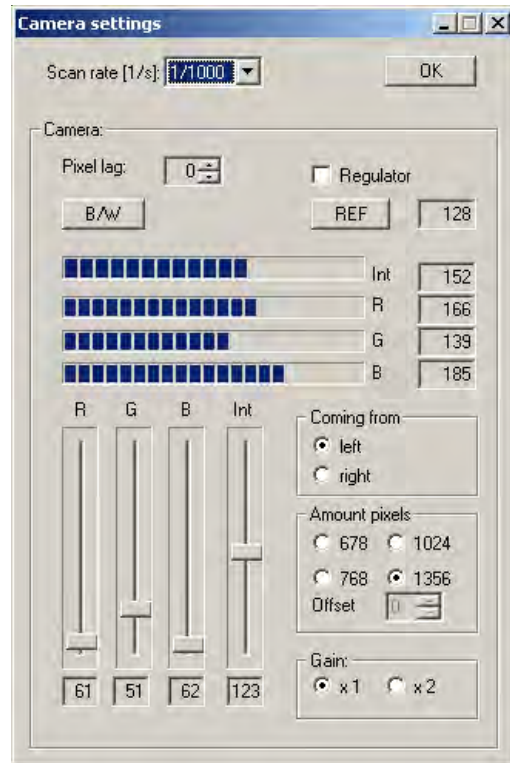
The finish line must be painted correctly on the athletic track. The finish line must be white. At the point where the finish line crosses the lanes there must be a black mark (see drawing). This black mark is necessary to see the lane borders in the photo-finish picture. If you change in the black and white mode of the camera it must show the finish line bright and the border of each finish line dark. If it does not show the track this way, it means that you did not adjust the camera correctly.

The camera has a sight to make an approximate adjustment. Make the pre-adjustment with the sight, and then make the precise adjustment by checking the color of the finish line and lane border on the monitor. To make the adjustment you must switch the camera to the black/white mode.

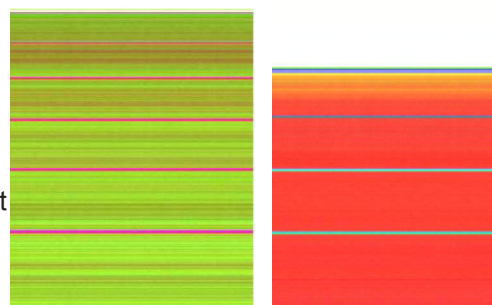


Camera adjustment:

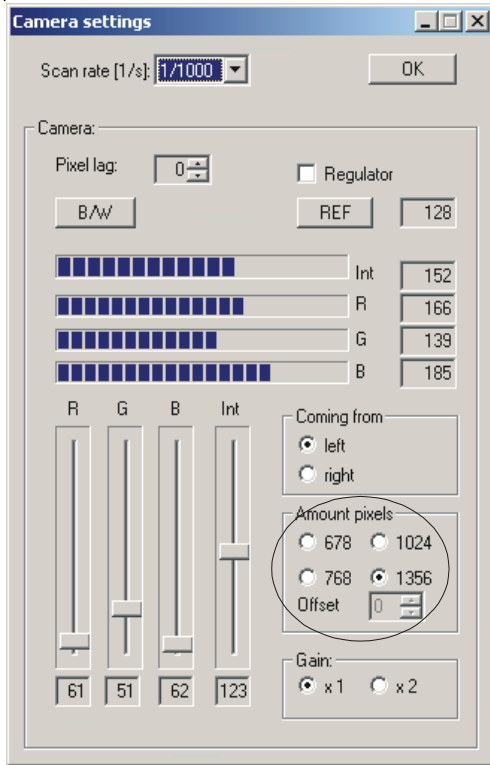
- Mount the camera (e.g. on tripod)
- Connect all components (PC and OCD1)
- Supply all components with power
- Switch the PC on and start WINDOWS
- Start the OPTIc program
- Click with mouse on <Rennen> (race)
- Click with mouse on <Vorschaubetrieb> (preview mode)
- Click with mouse on <Systemeinstellungen> (system adjustment)
- Click with mouse on <Kameraeinstellungen> (camera adjustment)
- Adjust <Abtasteinstellung> (scan rate) (we recommend for sprints 1000, and for long distance races 800).
- Adjust finish arrival side <Einlauf von> “links” (left) or “rechts” (right). Always use the camera side to decide the arrival side.
- Adjust <Dist.> (distance): Dist. is the pixel movement for the 3 RGB colors so they cover each other. We recommend to use 4.
- Adjust the light conditions to your satisfaction, this means that you should move the iris ring of the lens (ring that is close to camera) until you get a good contrast. It is also possible to adjust the light conditions electronically from the software with the lever <int.>.
- Adjust the lens so you can see all lanes of the track and so you get the maximal focus.
- Click <B/W> (black/white) bottom. Now it shows the picture in black and white.
- Adjust camera until you get a picture like shown to the left. The background at the edge of the track should be bright to get a good contrast for the runner using this lane. Please check also if you can get the runner of the farrest lane on the picture. On the picture it must show the track bright and the lane borders dark.
- Press <B/W> button again. Now it will show the picture in color. If you have adjusted the camera correctly it will show the finish line green and lane borders purple. The background should be still in a bright color.
- Now you can adjust the colors correctly with levers R (red), G (green) and B (blue).
- Save the adjustment by pressing <DIF>.



correct adjustmenta      wrong adjustment



If you finished all adjustments make a test picture of some runners. Check the picture quality and if you got all runners (of all lanes) on the picture. If you do not get all runners on the picture, or the picture is not sharp you have to do the adjustment again.



Setting of camera resolution:

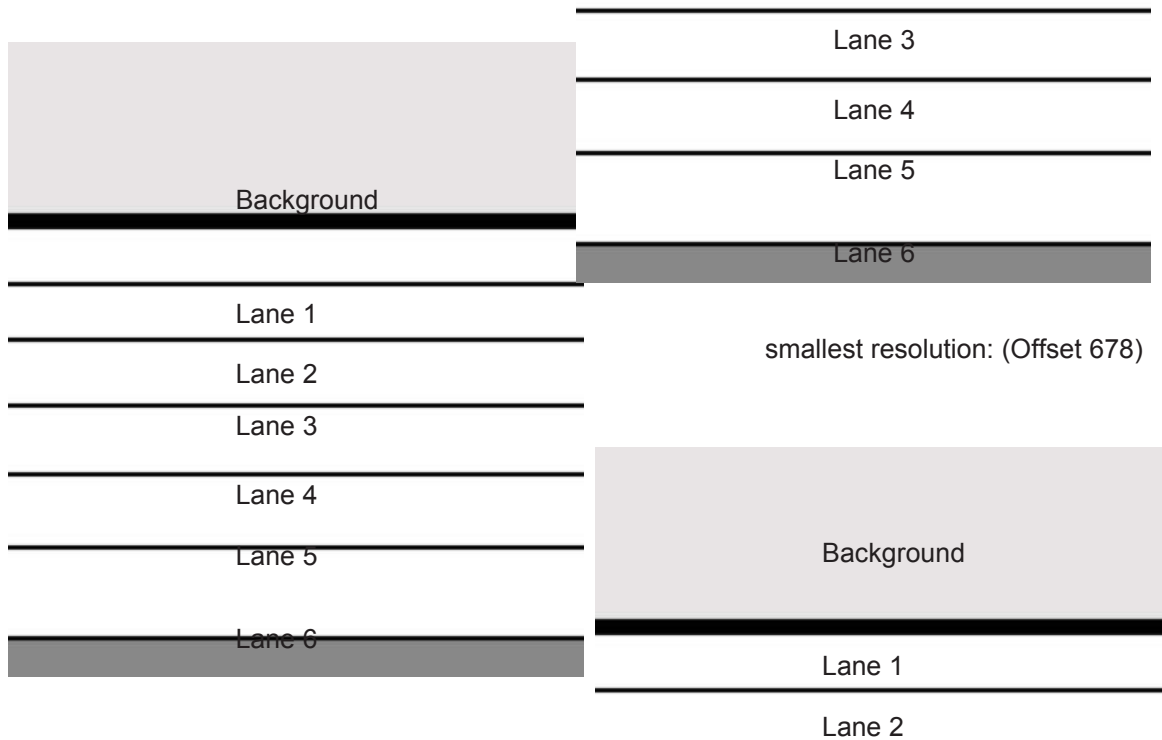
Only in the Windows NT-Version can the resolutions be set. Here are the advantages:

- Only the desired Part will be recorded. This is faster and saves space on the Harddisk.
- With the offset, you can pan virtually the Camera in vertical direction.

Here you can see a short demonstration of the effect the resolution and the offset have on the picture.

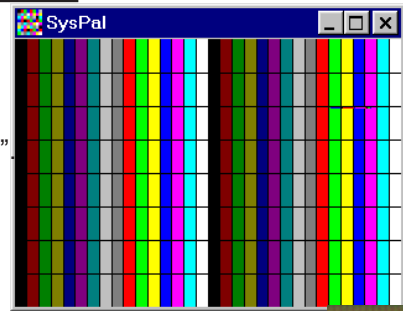
full resolution:

smallest resolution: (Offset 0)

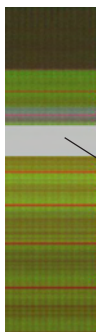


**4.1. Adjustment of the White Balance of the Camera:**

For the adjustment of the white balance we added an additional program. On page 9 (point 2.3.5) you will see how to install it. You can start this program by double clicking "c:\optic\syspal.exe". After you start the program you will see the window shown to the right.

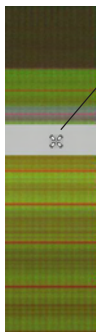


You also need to open the window "camera setting"




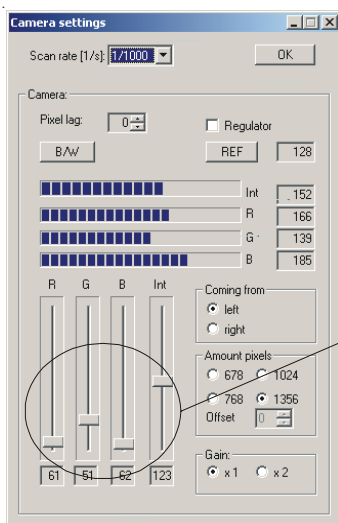
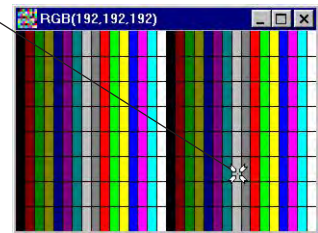
For the white balance you need a white spot on the finish line. The easiest way is to put a white paper on the finish line.

Now you must reduce the light intensity of the camera until it shows the white paper grey.



Move the cursor to the white spot of the test picture. In the program SYSPAL it shows in the upper blue part the RGB-values of the color that the cursor point is at. For the white balance adjustment you need to have all three figures below 255 and they must be about equal (e.g. 192, 192, 192). If you have one figure with 255 you must reduce the brightness.

Move the cursor into the program SYSPAL, press the right mouse button and keep it pressed. The cursor has now the following shape .




In order to adjust all three RGB colors with the same value, you must move the lever of the RGB colors in the camera settings.

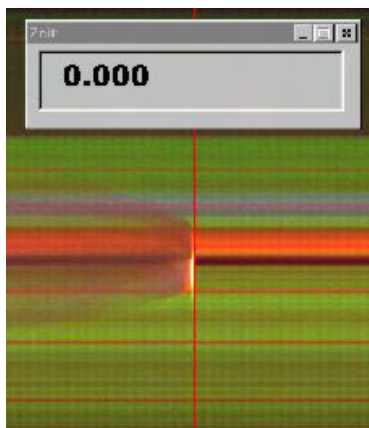
If you have about the same value for all three RGB colors you can finish the white balance adjustment. After the white balance adjustment you can adjust the brightness again as you need it.

Different light conditions also mean a different color spectrum. If you have artificial light you need a completely different adjustment than for sun light.

#### 4.2. Test start – An easy way for the Referee to check the System:

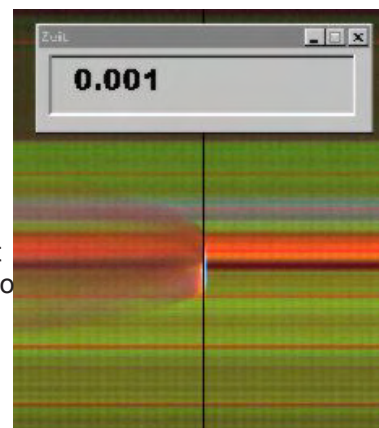
It is possible to record a start shot on the finish line. This start recording can be used to show the referee that the picture recording and time recording are synchronous.

- ☞ Adjust the camera as usual for a race.
- ☞ Click on "RACE"
- ☞ Click on "TEST START"
- ☞ Click on 
- ☞ Input the name of the race (test start)
- ☞ Press <ENTER>
- ☞ Adjust the precision on 1/1000
- ☞ Prepare the start gun as for a normal race at the finish line
- ☞ Lay the start gun on the finish line
- ☞ Put something dark (e.g. black paper) under the start gun (especially at the point where the smoke gets out of the barrel).
- ☞ Fire the start gun
- ☞ The start shot is automatically recorded and is shown in the picture on the screen.




At the beginning of the start shot it must show 0.000

If you change the time with the cursor key (e.g. 0.001 sec.) it must move the evaluation line further into the flame.



It is possible that it shows the flame not very sharp in the picture. The reason for this is the pixel lag. You must make the exact evaluation of the test start in the black/white mode.



Switch between color picture and black/white picture with button 





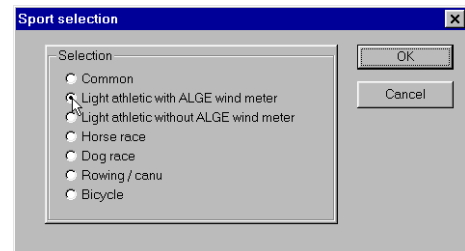
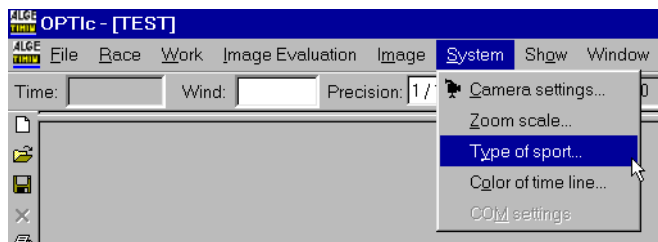
**4.3. Anemometer for Athletic:**

You can control the ALGE Anemometer Windspeed WS1 directly from the OPTic. This means that you have to adjust the correct race distance in the OPTic software and the rest is done by the OPTic and anemometer by itself. With the Windspeed WS 1 you do not need any operation of the anemometer and you need one helping person less per race day.



When using the Windspeed WS1 you need to make the following adjustments:

- ☞ Click on "System"
- ☞ Click on "Select the sport"
- ☞ Click on "Athletic with ALGE anemometer"

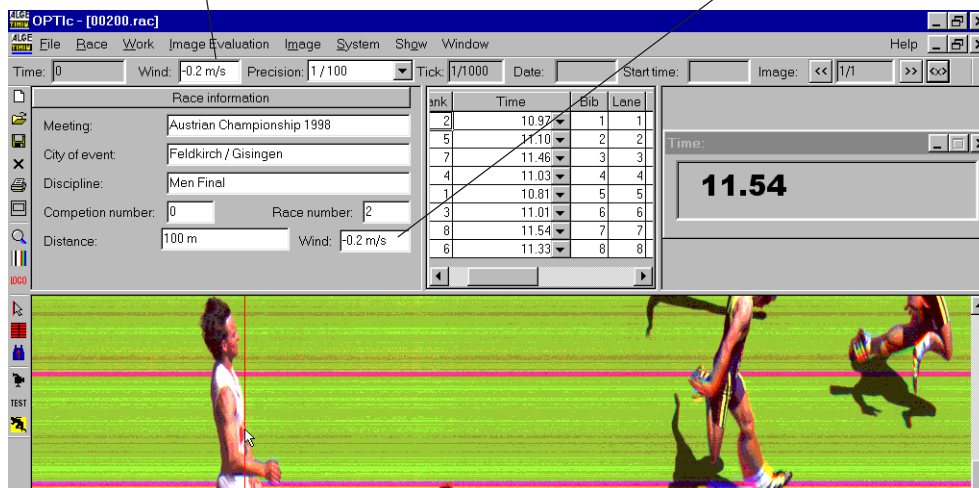


If you open a new race you must always select the race distance. With this information the software can operate the anemometer according to the IAAF rules.

<b>0 to 75 m</b>	5 sec. from start
<b>80 to 100 m</b>	10 sec. from start
<b>100 m hurdles to 110 m hurdles</b>	13 sec. from start
<b>200 m</b>	10 sec, measures start 10 sec. after start
<b>over 200 m</b>	no wind speed

In this field it always shows the actual wind speed before the race

In this field it always shows the official wind speed for the race



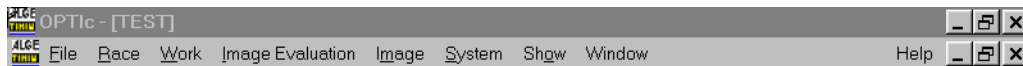
## 5. SOFTWARE

The software of the OPTIc runs with Windows 95 (Version B or newer) and Windows NT (Service Pack 3 or higher). The IEEE 1394 driver does not support Windows 98.
















If you do record with the OPTIc it is necessary to close all other programs. Other programs might the processor or hard disk, this means that the recording durance could be reduced.

The software meet the Windows standard. People using other Windows software will not have any problems with this program.

All functions of the program can be found under the following list:

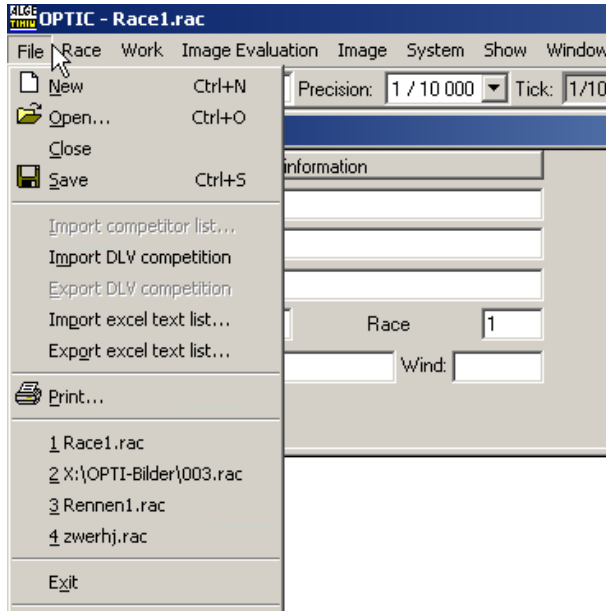


The most important functions are in the iconlist on the left screen border.

	<b>New</b>	Open a new file
	<b>Open</b>	Open an existing file (race)
	<b>Save</b>	Save the active file (race)
	<b>Close window</b>	Close the active file (race)
	<b>Print</b>	Print lists or pictures
	<b>Image cropping</b>	Mark a part of the picture in order to print it
	<b>Zoom window</b>	It opens a zoom window that shows the picture two or four times enlarged
	<b>Convert to b/w</b>	Switch between color and black/white picture
	<b>Insert logo</b>	Insert a ALGE logo into the pricture
	<b>Manuel evaluation</b>	Manual time evaluation of the race
	<b>Lane evaluation</b>	Time evaluation of the race by lanes
	<b>ID evaluation</b>	Time evaluation of the race by start number
	<b>Camera settings</b>	It opens a window where you can make the camera adjustments
	<b>Test image</b>	It shows a renewing test picture for the camera adjustment
	<b>Start race (separate)</b>	It opens the start dialogue and you can start the timing (race)

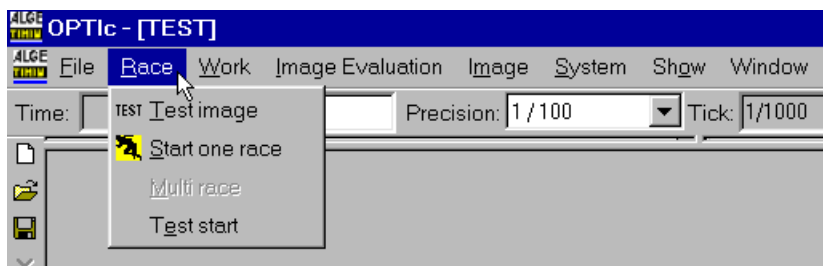
**5.1. Menus of the Software:**

**5.1.1. Menu <FILE>:**



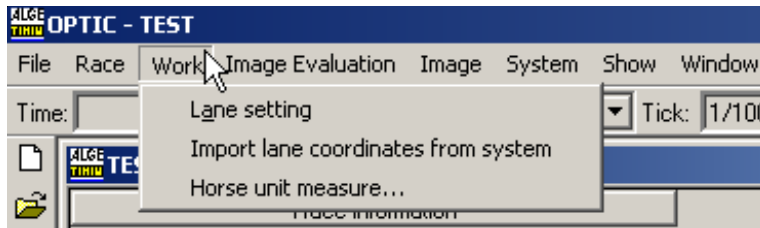
- NEW:** to prepare a new file (race)
- OPEN:** to open a existing file (race)
- CLOSE:** to close an existing file (race)
- SAVE:** to store the active file
- IMPORT COMPETITOR LIST:** to import an existing competitor list  
e.g. from previous race
- PRINT:** to print a result list or picture
- DLV IMPORT:** Import data from DLV program
- DLV EXPORT:** Export data for DLV program
- EXCEL IMPORT:** Import a tab-separated Textfile from e.g. EXCEL
- EXCEL EXPORT:** Export a tab-separated Textfile for e.g. EXCEL
- EXIT:** to exit the program

**5.1.2. Menu < RACE >:**



- TEST IMAGE:** to adjust the camera
- START ONE RACE:** to start the start dialogue of a race. Now you can start a race and record the finish arrival.  
no function
- MULTI RACE:** no function
- TEST START:** to check the start of the system (see point 4.2. Test start – An easy way for the Referee to check the System)

**5.1.3. Menu < WORK >:**

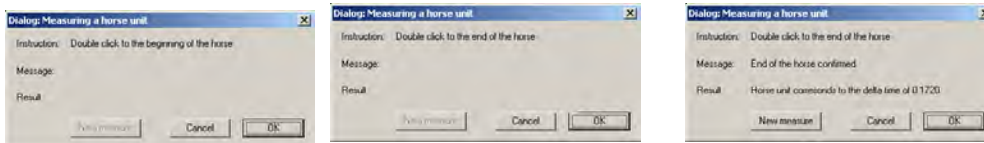


**LANE SETTING:** to input the lanes for a prompt and automatic evaluation during races were each competitor has his own lane (see point 6.3.2.)

**IMPORT LANE COORDINATES FROM SYSTEM:** With this function you can import the lane settings of a old race. You can only use this function if you have exactly the same camera setting and camera position.

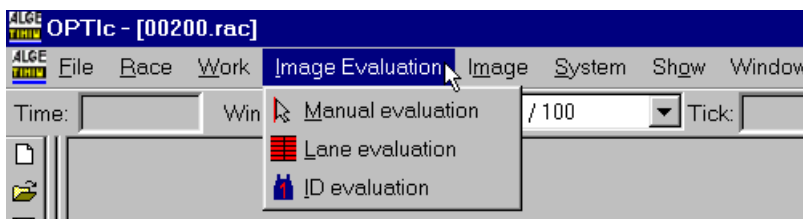
First you have to open the race from where you want to take the lane setting. Open now <WORK> and click on <IMPORT LANE COORDINATES FROM SYSTEM>.

**HORSE UNIT MEASURE:** For horse racing: For finding out how many the other horses are behind, you have to input a reference for 1 horse unit.



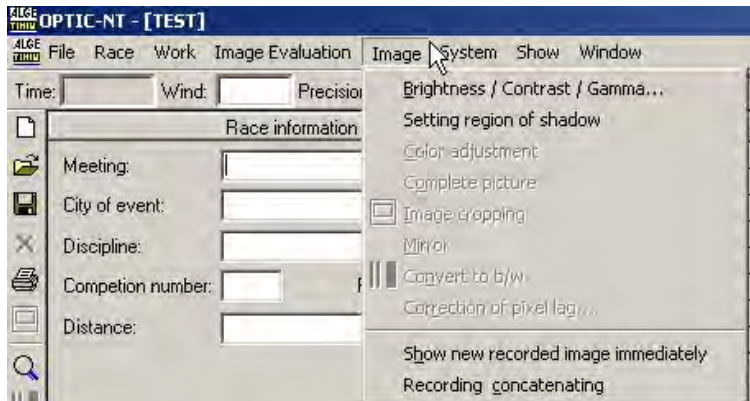
First you have to double-click to the head of the horse. then double-click to the back of the horse. After that you can see the time difference between head and back.

**5.1.4. Menu < IMAGE EVALUATION >:**

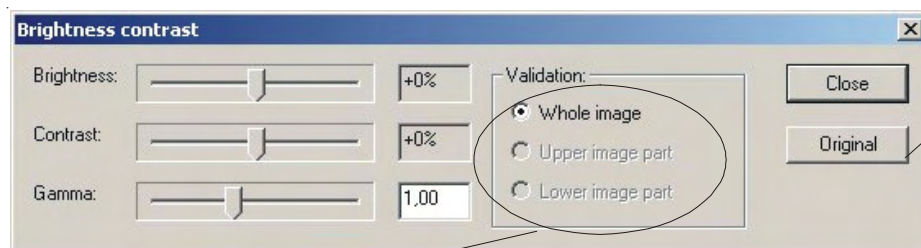


**MANUAL EVALUATION:** see point 6.3.1  
**LANE EVALUATION:** see point 6.3.2  
**ID EVALUATION:** see point 6.3.3

**5.1.5. Menu < IMAGE >:**



**BRIGHTNESS / CONTRAST:** after the race you can manipulate the picture in order to get a better picture. You can adjust the brightness, contrast, and gamma curve. With this functions you should be able to improve a bad picture.

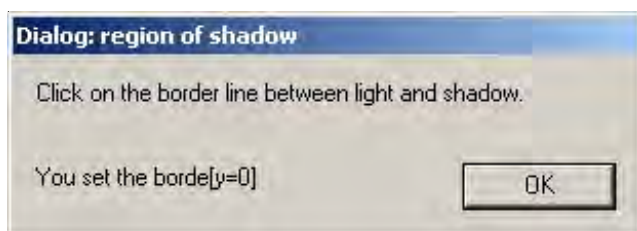


The original can be restored.

Upper image part and lower image part are splitted up by a border line. Here you can choose which region (light or shadow) should be prepared.

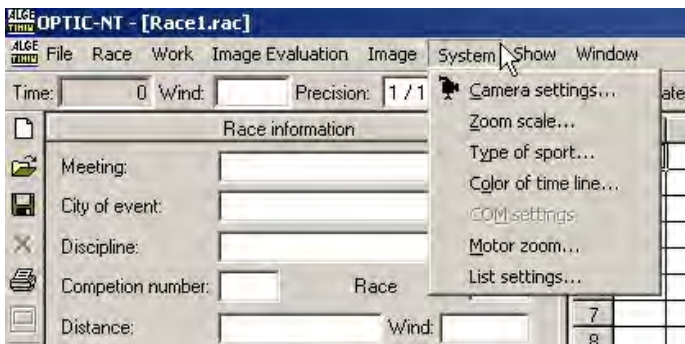
**REGION OF SHADOW:**

With this dialog you can define the border line between light and shadow (lower- and upper image part). Click with the mouse where the border line should be and than click OK.



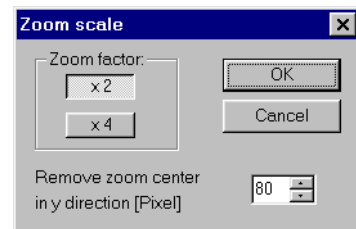
- IMAGE CROPPING:** with this function you can mark a part of the picture, if you want to print part of a picture. Click with the mouse into the picture and keep the mouse pressed. Now move the mouse in the picture. You will see now a rectangle that marks the part of the picture that you want to print.
- MIRROR:** no function yet
- CONVERT TO B/W:** you can switch between color and black/white picture. Especially if you need more sharpness in your picture you can switch on the b/w picture. This function is very handy if you have a wrong pixel lag adjusted. In the b/w picture it always takes the green (middle) sensor as reference.
- CORRECTION OF PIXEL LAG:** if the RGB colors does not cover each other (e.g. wrong speed adjusted) you can correct it. As reference we always take the green (middle) sensor.
- SHOW NEW RECORDED IMAGE IMMEDIATELY:** if you have this function activated (small pick) it will always show you automatically the actual picture (last picture recorded) on the monitor. Normally this function is only used for control function.
- RECORDING CONCATENATING:** if you activate this function (small pick) it will not make a separate picture for each trigger impulse, but make a bigger file. Use this unction especially for competitions where you have lanes (e.g. athletic sprints). If you do not have the picture automatically after the race you must finish it by pressing "finish race"

**5.1.6. Menu < SYSTEM >:**

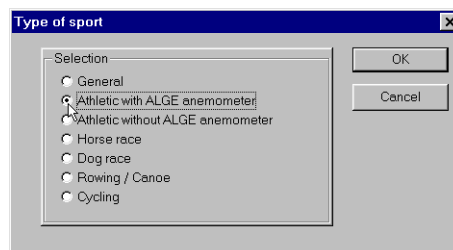


**CAMERA SETTINGS:** see point 4 "Adjustment of the Line Scan Camera OCC1"

**ZOOM SCALE:** you can adjust the zoom factor (2 or 4) for the zoom window. Further you can move the zoom center. This helps you especially in lane races.



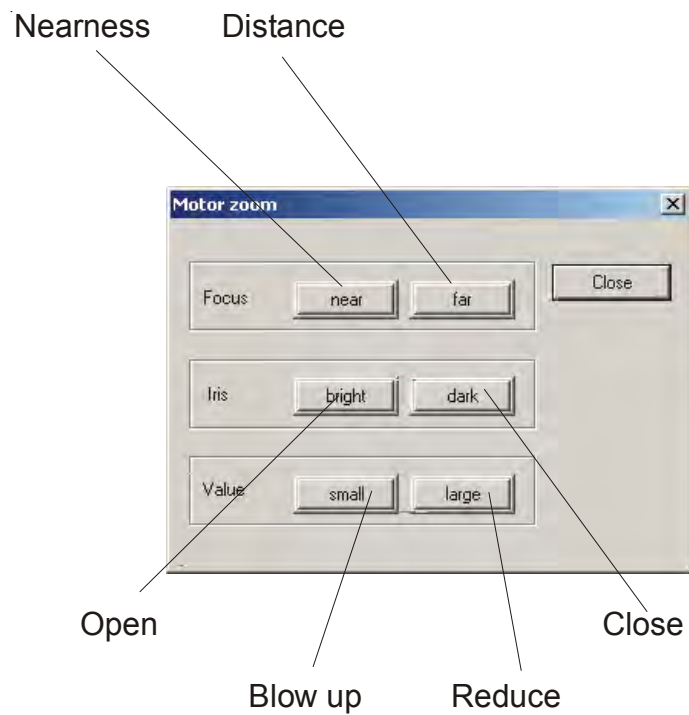
**TYPE OF SPORT:** you must adjust the correct sport in order to activate the sport specific rules.



**COLOR OF TIME LINE:** you can select the color for the time line. Use always a color that has a high contrast with the background of the picture.

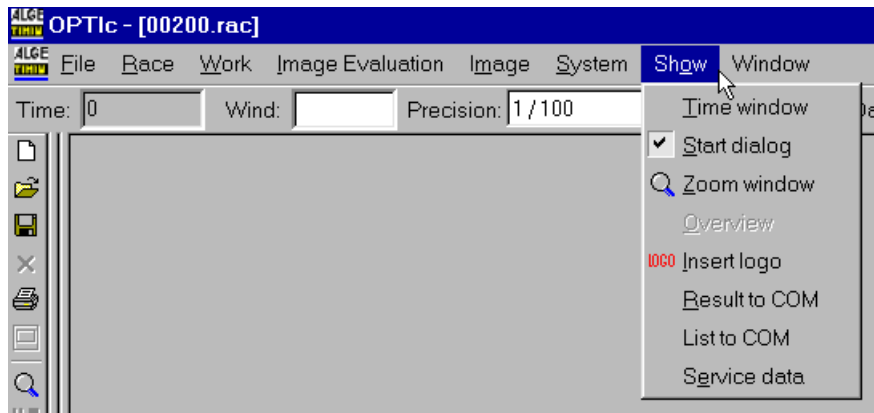
**COM SETTINGS:** no function yet

**MOTORZOOM:** With this dialog you can operate by remote control from the PC.  
If you click once, the lens will go one step to the direction you want.  
If you keep the button pressed the lens will go with growed speed to the direction you want.



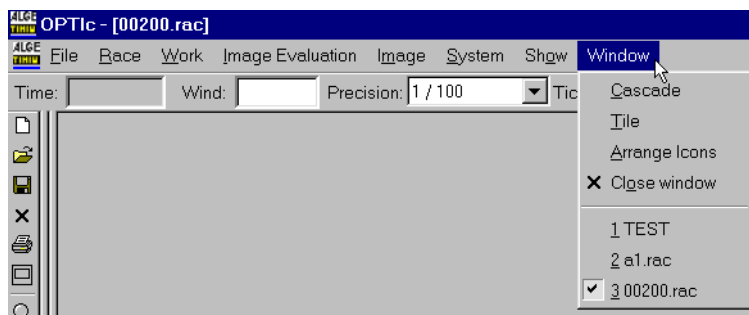
**SETTING THE COMPETITOR LIST:** see point 7.4.

**5.1.7. Menu < SHOW >**



- TIME WINDOW:** the ✓ shows, that the Time Window is active
- START DIALOG:** the ✓ shows, that the race is active (ready for start or recording)
- ZOOM WINDOW:** the ✓ shows, that the Zoom Window is active
- OVERVIEW:** no function yet
- INSERT LOGO:** the ✓ shows, that the ALGE LOGO is active
- RESULT TO COM:** during the evaluation it writes the time into the result list and output the data of the active competitor through the RS 232 interface (COM 1 or 2)
- LIST TO COM:** if you click on <LIST TO COM> it makes an output of the complete result list to COM port 1 or 2.
- SERVICE DATA:** to check the system (for service)

**5.1.8. Menu < WINDOW >**



Adjustment of the menu < WINDOW > like for every standard Windows program.



## 6. CARRYING OUT OF A RACE

- To start a race you have to click on the start icon on the toolbars. You have to fill in the name of the file (name of the race).

The start dialog will be opened:

The screenshot shows the 'Start dialog : Race1' window. It features a 'START' button, a 'Time' field showing '0', and a 'Recording' section with 'Activated' and 'Deactivated' buttons. There are also 'Impuls devices' for 'Start' and 'Finish', and a 'Deviation intensity of' field set to '88%'. Other fields include 'Available disc space' at '25862 [MB]' and 'Images in queue' at '0'. On the right side, there are buttons for 'False start', 'Running GAZ', 'End of Race', and 'Start offset'. Annotations with arrows point to these elements: 'Start impulse invalid' points to the 'Time' field; 'State of the Race: Not Ready, Ready, Lap Time, Recording' points to the 'START' button; 'Recording at stop impulse.' points to the 'Recording' section; 'No recording at stop impulse (round operation) GAZ only stops and starts running again.' points to the 'Deactivated' button; 'State of the impulse devices:' points to the 'Start' and 'Finish' checkboxes; 'Adjust the starting time (Daytime mode)' points to the 'Start offset' button; 'Difference of the light intensity in per cent. See at camera dialog.' points to the '88%' field; 'Free disk space' points to the '25862 [MB]' field; and 'Count of images to develop' points to the '0' field.

- The timing is ready now. After the happened start impulse the time begin to run. The start impulse was wrong: The watch can be putted back with the false start button.
- After the recording is active you can record a picture how long as the stop impulse is. The display board stops. Click "Running GAZ" and the time starts running again after the stop impulse.
- Is the recording not active the time stops for a short time on the display board and starts running again. You cannot record any picture.
- Evaluation of the pictures: see point 7.


## 7. EVALUATION

The first picture of the photofinish appears automatically on your screen. With the picture number you can move picture by picture forward or backwards.

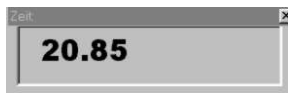


### 7.1. Showing the Time-Line on the screen

If it shows a finish picture on the monitor you must press the left mouse button and move the mouse over the screen. Together with the mouse cursor now moves the finish line. The time will be shown in the "time window".

With the key  you can move the finish line pixel by pixel to the left, with  to the right.




### 7.2. Time Window



It shows a free movable time window automatically. This window shows only the time of the evaluation (not the running time).

### 7.3. Transfer times into the competitor list

There are three possibilities to enter times for the photofinish picture into the competitor list


-  Manual identification
-  Lane identification
-  Start number identification

Use the **manual identification** if you want to transfer to any independent competitor in the competitor list (e.g. long distance races for athletic).

Use the **lane identification** if every competitor has his own lane (e.g. for sprint races in athletic, rowing, canoeing).

Use the **start number identification** if you can read (or have registered) each start number of the finish arrival (e.g. long distance races of athletic, cycling, horse races)

#### 7.3.1. Manual Identification

You select the manual evaluation by clicking with the mouse on the button , or if you click on <Auswertung> and then on <Auswertung manuell>.

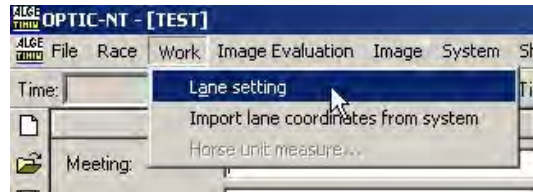
Mark the competitor in the competitor list that you want to evaluate (click on the field of the competitor list of the competitor). The field of the competitor will be marked blue if he has no time, and red if he has already a time.

Press the left mouse button and move the time line to the competitor that you want to evaluate. As soon as you press the right mouse button it will transfer the time to the marked competitor in the competitor list.

**7.3.2. Lane Identification**

If each competitor runs in fixed lanes (e.g. sprint races in athletic) it is the easiest way to use the track identification for the evaluation. The finish line has to be white and the borders has to be black.

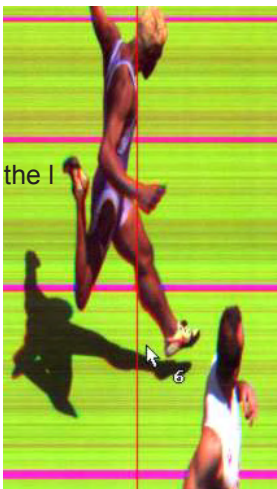
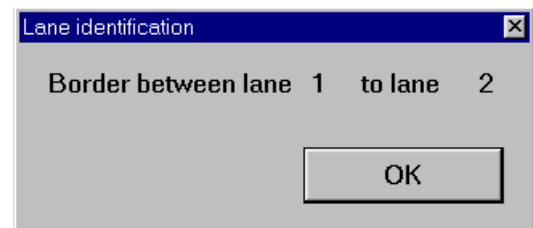
You can select the Lane Evaluation by clicking on <B>, or by clicking <Auswertung> (evaluation) and <Auswertung nach Bahn> (lane evaluation).



First you must enter the lane border for the automatic lane identification. This you must do only once, if you do not move the camera or leave the program.

**Lane Identification:**

- ☛ Click on <Bearbeiten> (Operate)
- ☛ Click on <Bahnidentifikation> (Lane Identification)
- ☛ It opens a window that describes the lane border (e.g. "Übergang von Bahn 1 zu Bahn 2" (border between lane 1 and 2). Click with the mouse on the border between the two described lanes. When you have entered all lane borders click on <OK>.



**Evaluation:**

- ☛ Move the time line (press left mouse button) to the chest of the athlete. The mouse arrow has next to it the lane number. This arrow must be on the correct lane. The competitor of lane is marked in the competitor list.
- ☛ Press the right mouse button to transfer the time to the competitor list.
- ☛ Make the same procedure for the next competitor to transfer his time to the competitor list.

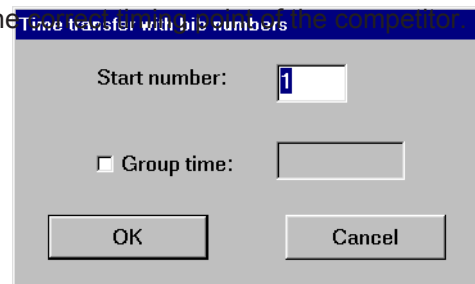
**7.3.3. Start Number Identification**



Use the start number identification, if every competitor has a start number that you can read in the picture or if you have recorded the start numbers in order of finish (e.g. for cycling races, horse races, long distance races in athletic).

Activate the start number evaluation by clicking with the mouse on the button xxx, or by clicking on <Image Evaluation> and then <ID evaluation>.

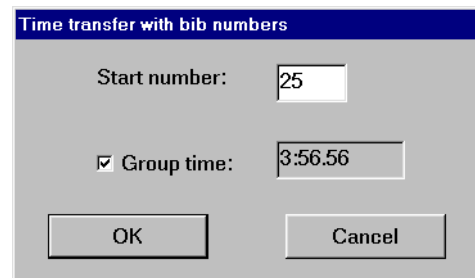
- ☞ press the left mouse button and move the time line to the correct competitor
- ☞ Now release the left mouse button.
- ☞ press briefly on the right mouse button
- ☞ It opens the window to enter the start number:
  - ☞ input the start number with the keyboard
  - ☞ click with mouse on <OK>
- ☞ move the time line to the next competitor
- ☞ etc.



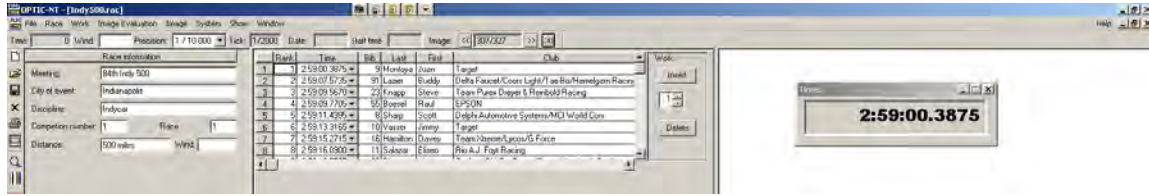
For cycling races you can also make group times. This means it always moves the time of the group into the result list. The order is done by the actual time.

**Evaluation for a group in cycling:**

- ☞ press the left mouse button and move the time line to the correct timing point of the first competitor of the group. Now release the left mouse button.
- ☞ press briefly on the right mouse button
- ☞ It opens the window to enter the start number:
  - ☞ click on group time
  - ☞ input the start number with the keyboard
  - ☞ click on <OK> with the mouse
- ☞ move the time line to the next competitor in the group
- ☞ press briefly on the right mouse button
- ☞ It opens the window to enter the start number:
  - ☞ the group time is already activated
  - ☞ input the start number with the keyboard
  - ☞ click on <OK> with the mouse
- ☞ move the time line to the next competitor in the group
- ☞ etc.
- ☞ move the time line to the first competitor outside of the group
- ☞ press briefly on the right mouse button
- ☞ It opens the window to enter the start number:
  - ☞ click on group time so it has no 3
  - ☞ input the start number with the keyboard
  - ☞ click on <OK> with the mouse
- ☞ etc.



**7.4. Competitor list**



In the above list you can fill in the data from the competition.

**1. ADJUSTMENT MODIFICATION:**

Show the average speed calculated with the registered time and distance

e.g. + 1 round or 1 round back

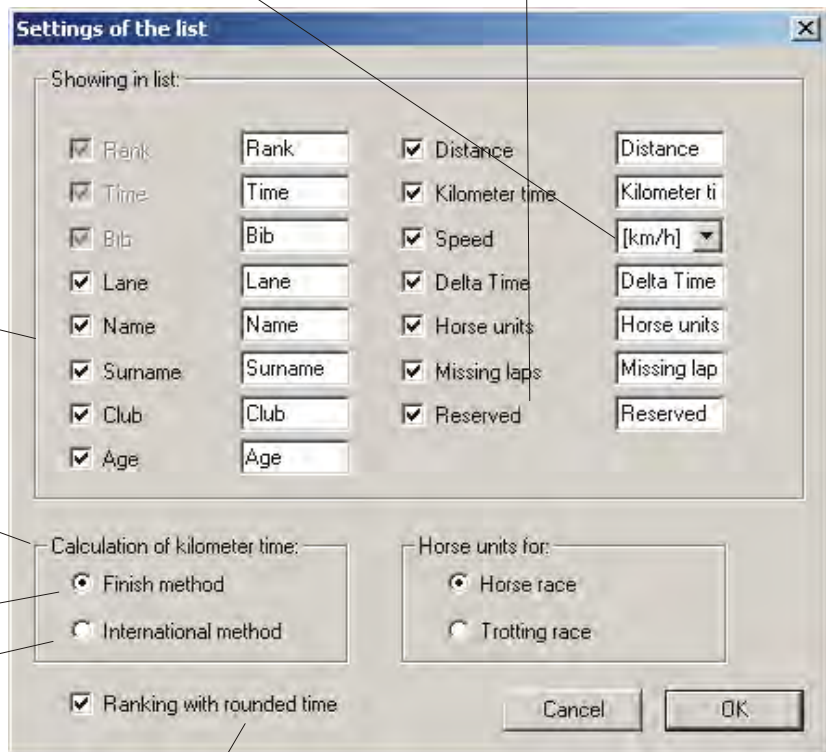
Change the text of the list e.g. (Club, Jockey, Team and so on.)

For horse riding

Information on the display

27,0

1:27,0



exact

rounded (1/100 adjustment exactness)

20,853  
20,854

1st time  
2nd time

1st rank  
2nd rank

1st rank  
1st rank

Here you can do any adjustments of the competitor list. These adjustments are saved automatically.

## 2. DESCRIPTION OF THE SPLIT:

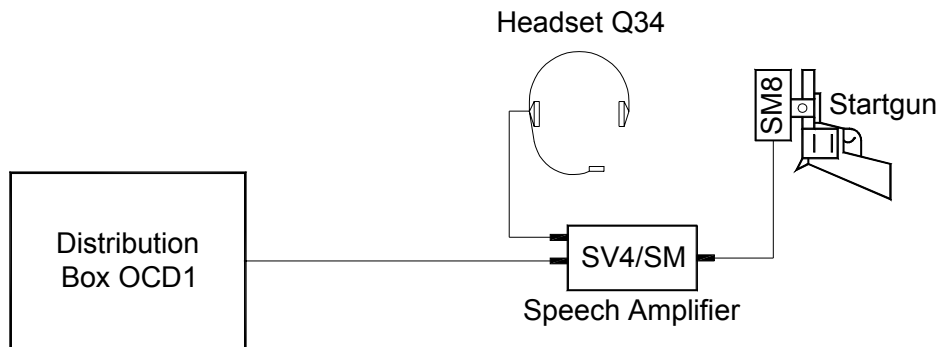
<i>Distance:</i>	Here you can fill in the distance of the race which you will need for your calculation.
<i>Time of kilometre:</i>	Special calculation for the horse riding.
<i>Speed:</i>	You can calculate the average speed with the registered time and distance.
<i>Delta time:</i>	Distance between the first and the the other competitors.
<i>Horse units:</i>	E.g. half a horse length. With the registered time it will be calculated automatically.
<i>Missing laps:</i>	Special for motorsport.
<i>Reserved:</i>	Reserved for further applications.

## 3. SPECIAL FUNCTIONS:

- a) *Sort:* You can sort the list after each split e.g. click split "rank" to sort after rank.
- b) *Distance:* Is there no distance in the list, the distance from the competition will be filled in automatically.

**8. OPTIc OPTIONS**

**8.1. Startmicrophone SM8, Speech Amplifier SV4/SM and Headset Q34:**



**Startmicrophone SM8:**

You need the Startmicrophone SM8 and the Speech Amplifier SV4/SM to trigger the timer when the start gun fires. The noise of the start gun triggers an electronic impulse in the Startmicrophone SM8. This impulse starts the timer of the OPTIc. The front of the Startmicrophone should be always close to the part of the gun has the loudest point (where the smoke leaves the gun). The SM8 can be screwed on top of the gun. The cable of the SM8 should point to the back of the gun. The cable of the SM8 must not be in contact with of the flames of the start gun, because it could be damaged.



You must always keep the start gun in a clean and good shape. The loudness must not be reduced by a dirty barrel. The ammunition of the gun must always be stored in a dry area and should not be older than a year.



**Speech Amplifier SV4/SM and Headset Q34:**



Speech Amplifier SV4/SM



Headset Q34

With the Speech Amplifier and Headset the starter can communicate through the start wire with the operator of the timing device (OPTic). The speech amplifier has a built in 9 V battery. You have to change the battery if you have problems with the communication.

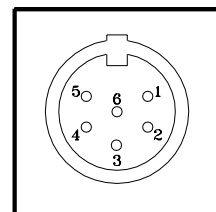
Attention: Disconnect the Headset Q34 and Startmicrophone SM8 from the Speech Amplifier SV4/SM after the end of the competition.



Connect the Speech Amplifier SV4/SM with a two wire cable (e.g. cable reel KT 300) at the OCD1 (banana socket 17). Be aware of the polarity of the cable. The polarity is OK if the light (LED) of the startmicrophone blinks.

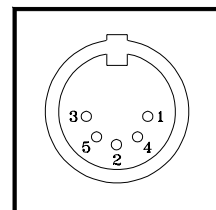
*Socket to connect the Startmicrophone SM8:*

- 1 signal output, open collector; max. 12 V / 50 mA  
impulse duration: low = ca. 100 ms
- 2 empty
- 3 ground
- 4 +6 to 15 Volt; 0,6 mA (from SV4/SM)
- 5 +5 Volt stabilized; 0,4 mA (from OCD1)



*Socket to connect the Headset Q34:*

- 1 microphone of Headset
- 2 ground
- 3 earphone of Headset
- 4 empty
- 5 empty





**8.2. Photocell:**

**8.2.1. Photocell RLS1n:**

The ALGE photocell RLS1n is made with the most advanced electronics. You can use the reflection photocell RLS1n for a distance from 1 to 25 Meter. If you need a longer distance than 25 Meters you have to use the type RLS1nd, which consist of a separate transmitter and receiver photocell.



**Principal:**

The transmitter of the photocell sends a modulated infrared beam. The receiver controls the infrared beam and makes an impulse for each interruption. If transmitter and receiver is built into one case we call it reflection photocell. The infrared beam is sent to a reflector. The function of the reflector is like a mirror, which reflexes the beam to the receiver. The other type of photocell (RLS1nd) has on one side a transmitter and on the other the receiver. The infrared beam goes direct from the transmitter to the receiver.

**Types of Photocells:**

- RLS1n: Infrared reflection photocell
- RLS1nd: Infrared photocell with separate transmitter and receiver
- RLS3c: Three-fold-photocell for track and field

**Power Supply for the Photocell RLS1n:**

- ☞ Up to 100 m cable length from the ALGE timing device by a 3-wire cable (this cable includes the power supply and impulse line).
- ☞ Internal Alkaline battery or NiCad battery (data cable with 2 wires, distances of some Kilometers are possible).

**The internal battery supplies the RLS1n for:**

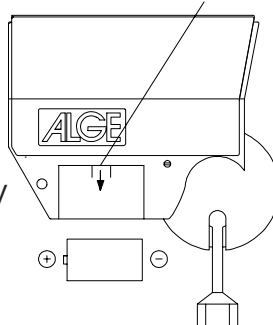
**Alkaline Baby Battery:** about 40 hours    **NiCd Baby Rechargeable Battery:** about 18 hours

**Meter Indication:**

*about 1/4 in the white field:* not adjusted or beam interrupted  
*green field:* adjusted to the reflector and beam is not interrupted

**Input of the battery:**

Press down to open battery compartment



**Insert the battery:**

Input the battery as far as possible into the battery compartment. When closing the cover press the battery into the compartment.

Alkaline baby battery, 1,5 V  
 or NiCd rechargeable baby  
 battery 1,2 Volt

**Switch on of internal Battery:**

The internal battery of the photocell RLS1n can be switched on with switch (1).

upper position = battery on lower position = battery off

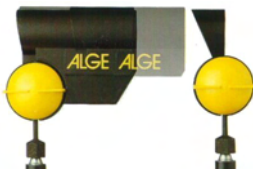
*Attention:* If you use a battery be carefull that the battery is switched off when you do not use the photocell. Otherwise the battery will be drained if you need the photocell the next time.

If you use no battery the switch position does not matter.

**Adjustment of the Photocell RLS1n:**

- ☞ Fasten the fastening-bracket for the photocell and reflector at a pole
- ☞ Screw the photocell and reflector on the fastening-bracket
- ☞ Twist the reflector toward the photocell
- ☞ Connect the cable (e.g. 001-10) at the photocell and timing device
- ☞ Turn the timing device (and photocell if internal battery) on
- ☞ Open the socket joint of the photocell (turn the yellow knob counter-clockwise)
- ☞ Aim at the reflector by using the sight on top of the photocell
- ☞ The needle of the level meter has to move as far as possible into the green field
- ☞ Close the socket joint of the photocell (turn the yellow knob clockwise)
- ☞ If you interrupt the infrared beam of the photocell you hear a beep of the timing device. The needle of the lever moves into the white area.

**Weather Cover:**



You can free out the weather cover in order to protect the lens from snow and rain.

When using the RLS1n on a glacier please always use the weather cover.

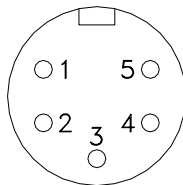
Please notice that the sun is not allowed to shine directly into the lense of the photocell. This could destroy the photocell.

**Technical Data of the Photocell RLS1n:**

- Max. Distance: 0,5 to 25 Meter
- Output: NPN transistor, open collector, active low
- Reaction Time: 300  $\mu$ s, 2 ms fix adjusted
- Impulse length: 20 to 1400 ms adjustable
- Measurements: 160 x 135 x 58 mm
- Weight: 0,6 kg
- Switch: on/off-switch for internal battery

*DIN-Socket Pin Connection:*

- 1 Signal output
- 2 Signal output
- 3 0 Volt
- 4 empty
- 5 +5V stabilized



*Banana Socket:*

- red signal output
- black 0 Volt

- Power Supply: external 5 VDC stabilized
- internal battery: Baby
- Power consumption: when giving an impulse max. 30mA  
without impulse max. 15 mA

- Working Time of Photocell RLS1n with Internal Battery:  
about 40 hours with alkaline battery  
about 18 hours with rechargeable battery



Impulse length of 20 to 1400 ms adjustable  
(adjust with small screw driver)

### **8.2.2. Three-Fold-Photocell**

The Three-Fold-Photocell consists of photocells arranged on top of each other built into the same case. There are two different types of the Three-Fold-Photocell. One type called **RLS3c** gives only a impulse if all 3 built-in photocells are covered simultaneously. The other type **RLS3c-s** has two switchable functions. One function receives the impulse if all 3 photocells are covered (Setting "M"), the other function makes an impulse if any photocell is covered (Setting "S").



The Three-Fold-Photocell has two identical DIN-sockets. If you use **ALGE** timing devices it is possible to supply the photocell direct from the timer up to a distance of 30 m. If you need a cable length over 30 m it is necessary to supply the photocell external. For this purpose you can use e.g. an **ALGE** net-charging-set NLG8, or any 12 V Battery. The loop resistance of the cable is not allowed to be above 2000 W.

#### **Adjustment of the Photocell RLS3c:**

- Mount the photocell and reflector on the tripods and set the upper end of both at chest level.
- Set the photocell and reflector on both sides of the finish line. The photocell should be placed on the side of the timer (this means you do not have to cross the track with the cable).
- The photocell must cover parts of the finish line if you use a photofinish camera. This means you must move backwards with the photocell from the finish line about 1 or 2 meter. If this is not possible adjust the photocell just a few centimeter before the finish line.
- Connect the Three-Fold-Photocell RLS3c with the timer by using cable 001-xx (red cable for finish).
- Turn on the timing device.
- Open the ball-and-socket-joint and adjust the photocell to the reflector. Use the sight hole for the adjustment in the upper part of the photocell. All three instruments must be in the green field.
- Fasten the ball-and-socket-joint. The photocell is ready.

**Attention:**

If the photocell is out of focus (or covered) the meter of the timing device starts to swing.  
The photocell and the reflector should be blocked off, so that no one can knock it during the race.

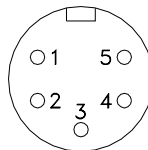
**Used for:** Athletic

**Technical Data of the Three-Fold-Photocell RLS3c:**

- Power Supply:** 7 to 15 VDC (Pin 4)  
or 5 VDC / 25 mA max. (Pin 5)
- Power Consumption:** **with 5 V supply form Timer S4:**  
not triggered: < 35 mA  
all 3 triggered: <50 mA  
**with 12 V supply (external):**  
not triggered: < 40 mA  
all 3 triggered: <55 mA
- Operating Distance:** 2 to 15 Meter
- Output:** NPN transistor, Open Collector, activ low
- Reaction Time:** 300 µs, 2 ms adjusted
- Impulse Length:** 20 to 1400 ms, adjustable
- Measurements:** 200 x 370 x 120 mm
- Weicht:** 2 kg (RLS3c with Reflector)

**Socket Pin Arrangement:**

- 1 Signal output (start)
- 2 Signal output (finish)
- 3 0 Volt
- 4 Power supply 7 to 15 VDC
- 5 +5V stabilized



**8.3. Display Board GAZ4 WS3 to show the wind speed:**

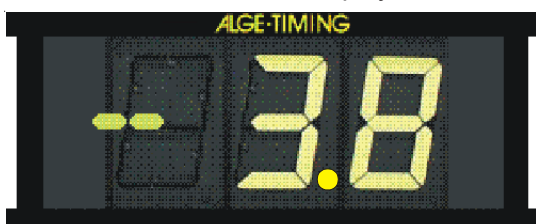
You need the adaper WSGA to show the wind speed on a display board GAZ4. Connect the WSGA direct at the display board. The WSGA is supplied by the display board. At the anemometer Windspeed WS1 connect the cable 141-02. If you have a long distance between the display board and the WSGA you can use a two wire cable with banana plugs (e.g. cable reel KT 150).



The display board is available with the following figure heigth and max. reading distance:

<b>GAZ4-WS315</b>	15 cm	about 60 m
<b>GAZ4-WS325</b>	25 cm	about 100 m
<b>GAZ4-WS345</b>	45 cm	about 160 m

the minus is fix on the display board



to make the plus you need an extra digit



## 9. TECHNICAL DATA

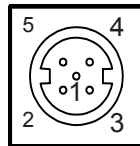
<b>Measuring range:</b>	23 hours, 59 minutes, 59,9999 seconds
<b>Crystal frequency:</b>	TCXO 10,000 MHz (Temperature Compensated Crystal Oscillator)
<b>Accuracy:</b>	
at changeable temperature range from:	-25 to +50°C: +/- 2,5 ppm at (+/- 0,009 s/h.)
Aging:	+/- 1 ppm per year
Frequency adjustment:	+/- 0,1 ppm at 25°C
<b>Temperature Operative Timing Range::</b>	0 to 50°C (xxx°F to 122°F)
<b>Power Supply:</b>	88 to 265 VAC (Distribution Box OCD1)
<b>Memory:</b>	<b>min. 64 MB RAM for the PC</b> min. 2 GB hard disk for the PC
<b>Recording of Pictures:</b>	<b>on the hard disk of PC</b>
<b>Storing the Races:</b>	- <b>floppy disk</b> - changeable hard disk - streamer - CD-R - CD-WR
<b>Input Pulse Input:</b>	<b>input resistance 10 kW against +5V</b> resolution with <1 Volt (falling flank) hysteresis ca. 2 Volt
<b>Output 5V DC stabilized:</b>	<b>total max. 120 mA</b>
<b>Speech Amplifier:</b>	<b>communication through start cable</b>
<b>Operation keys:</b>	<b>PC-keyboard</b> mouse
<b>External supply OCC1:</b>	20-28VDC Pinassignment: 1... 20-28VDC 2... GND 3... free

Display Board Interface "display board":

**Transfer Format:** 1 start bit, 8 data bit, no parity bit, 1 stop bit  
**Transfer Speed:** 2.400 Baud  
**Transfer Protocol:** ASCII

*PIN-Layout:*

**For the display board (and video generator) you have two identical sockets.**



- 1 ground
- 2 output power supply (6 to 15 VDC)
- 3 output data channel
- 4 output power supply (6 to 15 VDC)
- 5 output data channel

Data Format:

You can plug the cable of the display board in two different ways.

When you connect the display board cable on the Distribution Box OCD1 you can choose between two options to plug it by turning the cable 180°:

a) Channel 1 - Running Time:

The data format has 24 ASCII characters. The 24<sup>th</sup> character is carriage return. It sends every 1/10 second one data string. The fourth character is a point for the running time (running time), a blank for a zero time, or a C for a stop time (run time). For a standing time (run time and run time) you can have depending on the adjusted precision 1/10, 1/100, 1/1000, or 1/10.000 seconds.

Using this adjustment it will send only the winner time to the interface (and intermediate times)

1	2	
123456789012345678901234		Amount of ASCII characters
C	HH MM SS.zht	run time
.	HH MM SS.z	running time
C	HH MM SS.zht	run time

**the fourth character for running time, the 17<sup>th</sup> character for separation between seconds and 1/10 seconds**

- HH hours
- MM minutes
- SS seconds
- z 1/10 seconds
- h 1/100 seconds (depending on the precision)
- t 1/1000 seconds (depending on the adjusted precision)
- (CR) the 24<sup>th</sup> character is Carriage Return

b) Channel 2 - Run Time:

It sends every timing impulse(e.g. from the photocel) as a data string. The fourth character is a C for a stop time (run time) or ST for a start time. Depending on the adjusted precision it gives you the 1/10, 1/100, or 1/1000 or 1/10.000 seconds. This adjustment sends every stop impulse of the photocell (handswitch) to the interface. The data format has 24 ASCII characters. The 24<sup>th</sup> character is carriage return. You can use it also to print the times on a Pritner P4A.

Protokoll of a Race (Channel 1)

	0:00.00	time before the Start
.	0:00.0	running time (output every 1/10 second)
.	0:00.1	
usw.		
.	0:02.1	
.	0:02.2	
C	0:02.26	run time (final time or intermediate time)
C	0:02.26	
C	0:02.26	
.	0:07.5	running time (output every 1/10 second)
.	0:07.6	
.	0:07.7	
C	0:07.74	run time (final time or intermediate time)
C	0:07.74	
C	0:07.74	

Protokoll of a Race (Channel 2)

SZ	00:00:00.0000	start time
C	0:03.22	run time 1 (final time or intermediate time)
C	0:03.91	run time 2 (final time or intermediate time)
C	0:04.47	run time 3 (final time or intermediate time)
C	0:05.02	run time 4 (final time or intermediate time)
C	0:05.54	run time 5 (final time or intermediate time)
C	0:06.34	run time 6 (final time or intermediate time)
C	0:06.98	run time 7 (final time or intermediate time)
C	0:07.54	run time 8 (final time or intermediate time)
C	0:08.09	run time 9 (final time or intermediate time)

RS 232 Interface for Start List and Ranking List:

In order to send the start list and ranking list from the OPTIc e.g. to a Alphanumeric Display Board we use the RS 232 interface of the OPTIc-PC. You can adjust in the sinterface data for the OPTIc PC. The factory adjustment is the following:

**COM-Port:** COM 2  
**Transfer Format:** 1 start bit, 8 data bit, no parity bit, 1 stop bit  
**Transfer Speed:** 9.600 Baud  
**Transfer Protocol:** ASCII

This interface does output the complete data through of the result list through the COM port. The output may be different, depending on the adjustments of the ranking list in the OPTIc.

**Start List:**

Ergebnisliste nach Bahnen: Allgemein  
Wettkampftart: Athletic  
Austragungsort: Lustenau  
Datum: Startzeit:  
Wettkampfnummer: Laufnummer: 1

Rank	Time	StNr	Lane	Name	Surname	Club	Age
		1	1	Krause	Gunter	Berlin	73
		2	2	Platini	Luc	Paris	72
		3	3	Gunarson	Lars	Malmö	71
		4	4	Kurri	Matti	Helsinki	79
		5	5	Egli	Urs	Bern	69
		6	6	Bravo	Jordi	Madrid	74

**Ranking List:**

Ergebnisliste nach Bahnen: Allgemein  
Wettkampftart: Athletic  
Austragungsort: Lustenau  
Datum: 08.06.00 Startzeit: 17:02:11  
Wettkampfnummer: Laufnummer: 1

Rank	Time	StNr	Lane	Name	Surname	Club	Age
6	10.723	1	1	Krause	Gunter	Berlin	73
4	10.543	2	2	Platini	Luc	Paris	72
3	10.479	3	3	Gunarson	Lars	Malmö	71
1	10.202	4	4	Kurri	Matti	Helsinki	79
2	10.274	5	5	Egli	Urs	Bern	69
5	10.637	6	6	Bravo	Jordi	Madrid	74



## 10. ADDITION

### 10.1. Working with the registry:

Start and use of the record editor for further adjustment.  
You will not need in the normal usage and you should not change these adjustments.

Start of the Windows record editors:



All adjustments which concerned OPTIc you will find under the key name  
HKEY\_CURRENT\_USER\Software\ALGE TIMING\OPTIC

Under the key name

- camera settings:  
Here all adjustments for the camera are saved.
- file settings:  
Here any file information are saved.  
"Language dll loading?" (means another language as german)  
"Language dll path" under which path you will find this language  
"Work directory" under this path all receptions are saved  
Under the key "Div Cosa exchange" you will find the path for the imported or exported DLV file.
- list:  
Adjustments of the competitors list.
- system:  
With this key "hardware available" you can set the access to the hardware.

## **10.2. Excel Import and Export functions from OPTIc Version 3.5:**

This Function should be a little help for managing the result list of OPTIc. OPTIc does not produce resp. cannot read really EXCEL-Files. But Textfiles which are exported form EXCEL.  
To use this feature you have to pay attention for a view things:

The textfile has to look in this way:

The rows are separated through tab's.  
The order is in this way:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Rank	Time	Bib	Lane	Last name	First name	Club	Age	Distance	Kilometer time	Km/h	Deta time	Horse units	Missing laps	reserved

On an import of such a textfile the first two rows are ignored because the time is to made in OPTIc and also the rank.

On an export of such a textfile there can be some troubles at the import to EXCEL. So you have to pay attention to a view things:

File/Open: switch File-Type to textfiles (.txt) and choose the wanted file.

Now you see a dialog for the import:

Choose: separate through tabs, start with line 1

Go ahead. Next dialog choose as separator ONLY Tab's and press finish.

Note:

If you make an EXPORT to a opened file you will get a sharing violation. Close the textfile fist before you make an export.

Maybe the Time is in a strange format. In this case you select the column B and choose the format Time.