OPTI1sw

ALGE
TIMING

Table of Contents

ALGE OPTI 1sw manual copyright by: **ALGE TIMING**
    AUSTRIA

1.　INTRODUCING THE ALGE OPTI 1sw

1.1.　The parts of the OPTI system:

You need the following components:
- PC 486/DX2-66, 4 MB RAM (for pictures with 1024 pixel it is better to have 8 MB RAM)
- Windows 3.11 or Windows 95 (for Windows 95 you need 8 MB RAM)
- ALGE Computer-Board OCB1sw built into PC
- Super-VGA color monitor for PC (minimum 800 x 600 pixel resolution)
- Mouse for PC
- OPTI Distribution Box ODB1sw
- OPTI Line Camera OLC1sw
- OPTI Camera Interface OCI1sw
- Zoom Lens for Camera
- Power Supply NLG4 (charger for ODB1)
- Net-Battery-Device NBO1 (charger for OCI1sw and OLC1sw)
- Startmicrophone SM7
- Speech Amplifier SV3/SM
- 2 x Headset Q34
- Cabling for the system
- Photocell RLS1c with tripod to control the Camera and Display-Board

Additional Components:
- Printer to print the competitor lists and finish pictures (laser printer or ink jet)
- Three-Fold-Photocell RLS3c with tripod
- Handswitch 020-02
- Display Board GAZ4
- Cable real KT 300

1.2.　Functions:

ALGE OPTI 1sw is a fully electronic timing system that records the arrival of the competitors. It has also an integrated result service. The system accuracy is most precise because of its temperature compensated crystal oscillator (TCXO). The system runs on a PC compatible computer with Windows. The operation of the system is very easy because of the Windows surface.

A line scan camera (CCD image sensor) scans the movements at the finish line and records the data on the hard disk of the computer. Recording is possible up to 1000 lines (scans) per second.

After the race you can show the image on the monitor of the computer and read the time of each competitor up to 1/1000 of a second and store the time in the result list. If you have a tight race, it is possible to zoom any part of the picture. Also stretch to client and complete picture function is possible.

This camera takes lines of image rather than a 2 dimensional frame picture. The lines of an image are collected over the time and then combined to store a still image. The image has time in horizontal dimension and space in the vertical.

The picture below shows you how the system produces a image. If you use a sample time of 1/1000 seconds, it means that it makes 1000 scans (shots) per second.

picture from shot 1 to 7
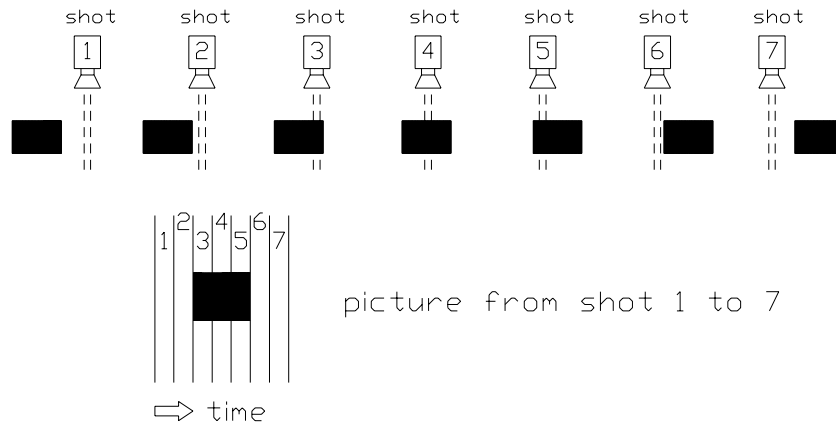
⇨ time

The next picture shows the same object passing the finish line (camera) with a slower speed. Therefore the object is for a longer time in front of the camera and the camera scans it more often. The still image includes now more shots of the object and is therefore longer.

picture from shot 1 to 10

⇨ time
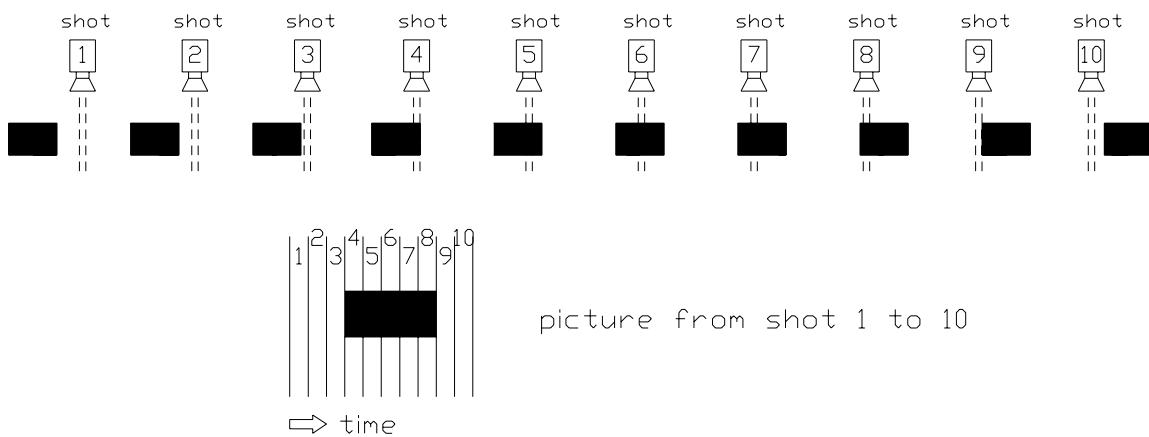
You need not to develop a negative with the ALGE OPTI 1sw system. This saves money (film and development costs) and working with aggressive chemicals. The still image of the OPTI is stored on the hard disk in bitmap format. You can print it at any time with a laser - or ink jet-printer.

1.3. Components of the System and its Functions:

Personal Computer (PC):
PC to process and store data, the hard disk must have 32 Bit access. If you run Windows 95 you need 8 MB RAM.

Color Monitor:
S-VGA color monitor (minimum 14", resolution must be 800 x 600 pixel or higher)

Key Board:
for PC operation

Mouse:
for PC operation

OPTI Computer Board OCB1sw built into PC:
Used for real time processing of the image data. A temperature compensated crystal oscillator (TCXO) guarantees highest timing precision.

OPTI Distribution Box ODB1sw:
To connect all external devices.

OPTI Line Scan Camera OLC1sw:
To scan the image.

OPTI Camera Interface OCI1sw:
To scan the image

Lens for Camera:
Depending on how you use the system take a zoom or fix lens.

Power Supply NLG4:
Power supply for distribution box ODB1sw.

Net-Battery-Device NBO1:
Power supply for OPTI camera interface OCI1sw and camera OLC1sw.

Speech amplifier SV3/SM:
Speech amplifier for speech connection form start to timer. At the speech amplifier you connect as well the Startmicrophone SM7

Headset Q34:
You need a headset at the start and timer. You can talk now through the 2-wire impulse cable from the start to the timer.

Startmicrophone SM7:
Starts the timer by shooting a gun (start impulse).

Three-Fold Photocell RLS3c:
Photocell to control the line scan camera and to stop the unofficial time for the display board (track).

Photocell RLS1c:
Photocell to control the line scan camera and to stop the unofficial time for the display board (track). For track you should use the RLS3c. It prevents you from impulses made by arms of the athlete.

Handswitch 020-02:
To control manually the camera.

Display Board GAZ4:
To show the running time as well as the unofficial run time.

Printer for PC:
Prints start list, ranking list, and finish image. The printer should be a laser printer. In order to have good pictures it should have 600 dpi. The printing speed depends on the printer speed. The printer must have enough RAM to print the image.

Cable Reel KT300:
2-wire cable form start to the timer or form the display board to the time.

1.4. For which Sports do you use the OPTI:

Athletics:
- Sprint
- Long distance races

Cycling:
- Track
- Road races

Rowing:

Canoe / Kayak:

Horse Races:
- Gallop
- Trotting Races

Greyhound Races:

Car Races:
- Road Races
- Autocross

Motorcycle Races:
- Road Races
- Motocross
- Speedway

Short Truck Skating:

Cross Country Skiing:

Biathlon:

Roller Skating:

Roller Blade:

2. INSTALLING THE SYSTEM

2.1. How to built the OPTI Computer-Board OCB1sw into your PC:

It is of advantage, if your ALGE or computer dealer installs the OCB1sw into your PC. This guarantees you, that you will not lose the warrantee of the PC.

- Turn the PC off
- Open the case of the PC
- Unscrew and remove the cover of a free 16 bit slot
- Check the Dip-switches of the OCB1sw (see below)
- Put board into free slot
- Screw board in PC
- Close the case of the PC
- Turn the PC on
- Install software in PC
- Reset the PC

Adjustment of Dip-Switches on ALGE OPTI-Computer Board OCB1:
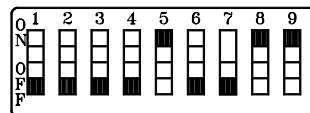
1 = off	4 = off	7 = on
2 = off	5 = on	8 = on
3 = off	6 = off	9 = on

The OPTI-Computer Board OCB1 needs Interrupt 5 of the PC.

The OPTI-Computer Board OCB1 needs the following I/O addresses:
                150 Hex, 160 Hex, 162 Hex, 163 Hex

2.2. Power Supply:

We recommend to use a UPS for the complete system (except printer). This guarantees you in case of a power failure that the system continues to work.

PC, Monitor and Printer:
Power supply like described in the manual of each device.

OPTI Distribution Box ODB1sw:
Use power supply NLG4 to supply the Distribution Box ODB1sw. Connect the NLG4 at outlet.

OPTI Camera Interface OCI1sw and Line Camera OLC1sw:
Use power supply NBO1 to supply the Camera Interface OCI1sw and Line Camera OLC1sw.
Connect the NLG4 at outlet or through Amphenol plug at 12 V battery.

2.3. Installation of the Software:

The ALGE-Computer-Board should be installed from your ALGE or Computer dealer. The PC must meet the following details to work without problems:

PC necessities:

System with a 514 pixel camera:

Processor:	486/DX2-66 or faster processor
DOS-Version:	MS DOS version 5.0 or higher and Windows 3.11 or Windows 95
Hard Disk:	Minimum 240 MB, maximum 14 ms regress time, 32-bit access
RAM:	Minimum 4 MB, better 8 MB (for Windows 95 you need 8 MB RAM)
Floppy Disk:	1 floppy disk 3 $\frac{1}{2}$"
Computer Board OCB1:	one complete ISA/AT slot (16 bit slot) must be free for the ALGE OPTI Computer Board OCB1sw
Graphic board:	S-VGA, minimum 1 MB RAM, Resolution: minimal 800 x 600, 256 colors better 1024 x 768, 256 colors
Internal bus:	PCI bus or local bus

System with a 1024 pixel camera:

Processor:	486/DX2-66 or faster processor
DOS-Version:	MS DOS version 5.0 or higher and Windows 3.11 or Windows 95
Hard Disk:	Minimum 420 MB, maximum 14 ms regress time, 32-bit access
RAM:	Minimum 8 MB, better 16 MB
Floppy Disk:	1 floppy disk 3 $\frac{1}{2}$"
Computer Board OCB1:	one complete ISA/AT slot (16 bit slot) must be free for the ALGE OPTI Computer Board OCB1sw
Graphic board:	S-VGA, minimum 1 MB RAM, 1024 x 768, 256 colors
Internal bus:	PCI bus or local bus

Installation of the OPTI software on Windows 3.11:

To install the OPTI software is very easy. If you use the following instruction you should have no problems.

- start the PC
- start Windows
- insert the floppy disk into drive A: or B:
- click on FILE in the menu list
- click on EXECUTE
- input: A:\CSETUP or   B:\CSETUP (depending on the floppy disk that you use)
- click on OK
- the installation program starts
- click on CONTINUE when the installation stops
- input another directory if you want to use another directory than the suggested   e.g. C:\AGLE
- click CONTINUE
- wait until it shows the text: "The application is successfully loaded on your hard disk".
- Click with the mouse on OK

Installation of the OPTI software on Windows 95:

ALGE can not give a warrantee that the OPTI runs 100% well under Windows 95. Windows 95 does take the task of the additional processor on the OCB1. That means, during that time the hard disk is not available to store the data.

- start the PC, Windows 95 start automatically
- start the program EXPLORER
- double click the hard disk were WINDOWS 95 is installed
- double click the directory of WINDOWS 95 (mostly called WINDOWS)
- double click the file PROGMAN.EXE
- insert the floppy disk into drive A: or B:
- click on FILE in the menu list
- click on EXECUTE
- input: A:\CSETUP or   B:\CSETUP (depending on the floppy disk that you use)
- click on OK
- the installation program starts
- click on CONTINUE when the installation stops
- input another directory if you want to use another directory than the suggested   e.g. C:\AGLE
- click CONTINUE
- wait until it shows the text: "The application is successfully loaded on your hard disk".
- Click with the mouse on OK

If the setup program shows a error message during the installation try to install the OPTI software again.

Adjustment of the interface for data output:

You need the data output when using a separate evaluation software on another PC. The ALGE OPTI system can transmit the results through the RS 232 interface (COM1 or COM2).

You must adjust the interface for your PC. This should be done by the dealer of the evaluation software or by your ALGE representative.

Open the FILE MANAGER of Windows and go into the OPTI directory

- click on OPTI.INI
- the editor of Windows shows now the OPTI.INI file
- at the end of the first paragraph it says:
    bCommActive=0
- change this to "bCommActive=1"
- click with the mouse on FILE
- click with the mouse on EXIT
- click with the mouse on OK

- click with the mouse on COMM.INI in the FILE MANAGER
- the editor of Windows shows now the COMM.INI file
- input the serial interface that you want to use (COM1 or COM2)
- adjust the correct baud rate
- adjust the correct data format
- click with the mouse on FILE
- click with the mouse on EXIT
- click with the mouse on OK
- adjust baud rate
- adjust output format

Adjustment for different cameras:

We use two types of cameras. The camera with 512 pixel is standard.

Adjustment for a camera with 512 pixel in the OPTI.INI file:
    bLC1912=0   adjustment for a 512 pixel camera
    nCableLength=30   cable 098 is allowed to be as long as 30 meter

Adjustment for 1024 pixel camera:
    bLC1912=1   adjustment for 1024 pixel camera
    nCableLength=5   cable 098 is not allowed to be longer than 5 meter

2.4. Adjustment of the OPTI.INI file:

You can make different adjustments in the file OPTI.INI of the ALGE directory. For normal use it is not necessary to make any changes. If you want to make changes it is necessary to read this section very careful. Wrong changes in this file can cause problems.

In order to edit the OPTI.INI file you must open the FILE MANAGER of WINDOWS. Now double-click OPTI.INI. in the ALGE root.

OPTI.INI has the following factory adjustment:

```
1     [System]
2     sWindow=3,7,0,828,762
3     bColor=0                      ;  0 means black and white system
4     bTra=1                        ;  set to 1 if opti full system  set 0 for demo version
5     nMaxRec=100                   ;  entries in competitor list
6     bWarnIfNoWind=1               ;  Activate the warning message before printing
7     bCommActivate=0               ;  1 means activate  0 means deactivate the comm port
8     bShowLogo=0                   ;  set to 1 if evaluation by start number should be default
9     bEvalByStartNumber=0          ;  set to 1 if evaluation by start number should be default
10    bActivateMoreRaces=1          ;  set to 1 for recording more races   HINT: read the opti.txt
11    szFilter=Race (*.RAC)|*.rac|
12    szFilterTxt=List (*.TXT)|*.txt|
13    szBootFile=c:\OPTI2_7\b_w4m_27.ace 14
15
16    [WFS 3.1]
17    Board0=336,352,352,353,354,355
18    Camera0=6800,1300,1300,1000,1000
19    bFastLink=1
20    nDMAChannel=0
21    bLC1912=0                     ;  Set 1 if a LC1912 camera is used and 0 for a LC1911
22    bCamInterface1995=1           ;  Set 1 if the camera interface release in 1995
23    nLinesBefore=160              ;  Recorded lines before finish event: 48 is minimum
24    nLinesAfter=120               ;  Recorded lines after  finish event: 48 is minimum
25
26    ;The width of an image in lines for  512 Pixel: range is 1400 min - 4000 max
27    ;The width of an image in lines for  768 Pixel: range is 1400 min - 3000 max
28    ;The width of an image in lines for 1024 Pixel: range is 1400 min - 2000 max
29    nMaxImageLines=2000
30    nCableLength=30               ;  The camera cable length in meter [ 5, 10, 15, 20 ,30 ]
31    nRecFactor=1                  ;  Range is 1 .. 10
32    nDefaultPixel=512             ;  Set the startup default pixel resolution
33    bWindMeter=0                  ;  1 means activate   0 means deactivate the wind meter
34
35    [ListHeader]
36    bLoadListHeader=0    ;  Set 0 for loading default and 1 for this list
37    szRank=RANK                   ;  4 character max
38    szTime=TIME                   ;  4 character max
39    szStNr=StNo                   ;  4 character max
40    szLane=WGT                    ;  4 character max
41    szLastName=HORSE              ; 12 character max
42    szSurName=JOCKEY              ; 12 character max
43    szClub=OWNER                  ; 12 character max
44    szYear=AGE                    ;  4 character max
```

The number at the beginning of each line is made for explanation. You wont see this number in the editor.

Line 1:   info line
Line 2:   no changes are allowed
Line 3:   no changes are allowed
Line 4:   bTra =1 complete OPTI system is installed
           bTra=0 demo system (no OPTI-computer-board is in the PC)
Line 5:   maximum amount of entry in the competitor list
Line 6:   warning if the wind speed has no input
           bWarnIfNoWind=1   warning is active
           bWarnIfNoWind=0   no warning
Line 7:   Activate or deactivate the serial interface for output of data
           bCommActivate=0   COM is off
           bCommActivate=1   COM is on (more adjustments in COMM.INI)
Line 8:   showing Logo in the bitmap or not
           bShowLogo=1   Logo is shown on the screen
           bShowLogo=0   Logo is not shown on the screen
Line 9:   adjustment for evaluation:
           bEvalByStartNumber=0   pre adjustment for manual evaluation
           bEvalByStartNumber=1   pre adjustment for start number evaluation
Line 10:   To activate the F3-Button to start three races parallel
           bActivateMoreRaces=0   Button <F3> is not activated. You can start only one race
           bActivateMoreRaces=1   You can start up to three races in parallel: Button <F3>
           bActivateMoreRaces is only allowed on 1 if you use a PC with 486/DX2-66 or higher. The
           hard disk needs a 32 bit file access (PCI bus or Local bus). If you do not have this configu-
           ration it may cause problems during recording if you set on 1.
Line 12:   no changes are allowed
Line 13:   path for this file (szBootFile) must be correct (adjustment automatically through installa-
           tion)
Line 14:   empty
Line 15:   empty
Line 16:   info line
Line 17:   no changes are allowed
Line 18:   no changes are allowed
Line 19:   no changes are allowed
Line 20:   no changes are allowed
Line 21:   Adjustment of the camera type:
           bLC1912=0   camera type LC1911 with 512 pixel
           bLC1912=1   camera type LC1912 with 1024 pixel
Line 22:   Camera Interface OCI1sw adjustment
           bCamInterface1995=1   type starting 1995
           bCamInterface1995=0   type before 1995
Line 23:   recorded lines before the competitor triggers the photocell
           nLinesBefore=160   Company adjustment is 160 lines. You can adjust this value be-
                                tween 48 and 500 lines)
Line 24:   recorded lines after the competitor leaves the photocell
           nLinesAfter=120   Company adjustment is 120 lines. You can adjust this value be-
                               tween 48 and 500 lines)
Line 25:   empty
Line 26:   info line
Line 27:   info line
Line 28:   info line

Line 29: Adjustment of the maximum bitmap length: As longer as you make the bitmap, as longer it takes to load a picture.

        picture with 514 pixel: 1400 to 4000 lines per bitmap
        picture with 768 pixel: 1400 to 3000 lines per bitmap
        picture with 1024 pixel: 1400 to 2000 lines per bitmap
    nMaxImage=2000   company adjustment

Line 30: the cable length for cable 098 (between ODB1 and OCI1) must be correct:
    nCableLength=30   cable length is 30 m
    nCableLength=20   cable length is 20 m
    nCableLength=15   cable length is 15 m
    nCableLength=10   cable length is 10 m
    nCableLength=5   cable length is 5 m

Line 31: total recording time of a race, adjustable from 1 to 10
    nRecFactor=1   for 512 pixel and 1/1000 sample time you can record 30 seconds
    nRecFactor=0   for 412 pixel and 1/1000 sample time you can record 5 minutes
                          (30 sec x 10 = 300 sec = 5 min)

Line 32: default setup for the amount of pixel read from the camera:
    nDefaultPixel=512   for OPTI systems with camera OLC1sw and OLC2sw
    nDefaultPixel=1024   for OPTI systems with camera OLC2sw

Line 33: to activate the RS232 interface of the ODB1 to read data from a wind aneometer
    bWindMeter=0   you will not receive data through the ODB1 RS232 interface
    bWindMeter=1   you can receive wind-data through the ODB1 RS232 interface. For the aneometer of Nordic and Gill Instruments we need to modify the ODB1.

Line 34: empty

Line 35: info line

Line 36: Adjustment if the program uses the programmed list head or if you use your own list head:
    bLoadListHead=0   programmed list head is used
    bLoadListHead=1   list head from line 24 to 31 is used

Line 37: szRank=XXXX You can input a name instead of the X (max. 4 characters)

Line 38: szTime=XXXX You can input a name instead of the X (max. 4 characters)

Line 39: szStNr=XXXX   You can input a name instead of the X (max. 4 characters)

Line 40: szLane=XXXX You can input a name instead of the X (max. 4 characters)

Line 41: szLastName=XXXXXXXXXXXX   You can input a name instead of the X (max. 12 characters)

Line 42: szSurName=XXXXXXXXXXXX   You can input a name instead of the X (max. 12 characters)

Line 43: szClub=XXXXXXXXXXXX You can input a name instead of the X (max. 12 characters)

Line 44: szYear=XXXX   You can input a name instead of the X (max. 4 characters)

2.5.   Setup of the devices:

The maximum distance between PC and camera is 30 Meter.
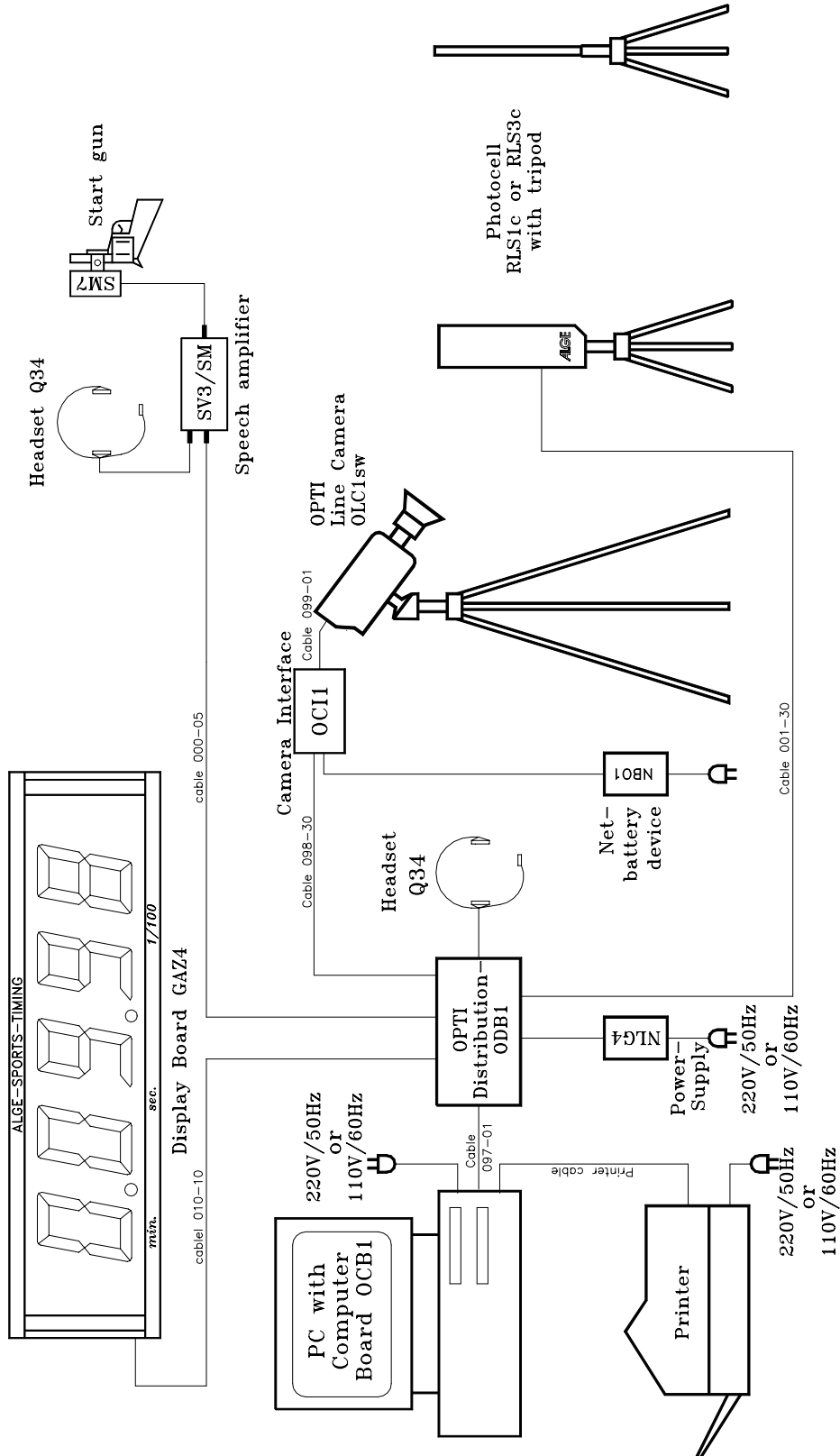
2.6.   Setup of the OPTI Line Scan Camera OLC1sw:

Positioning of the camera:

The camera must be placed exact 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 with the furthest distance.

The following table tells you witch distance the camera needs for a track stadium with 6 or 8 tracks. For a good camera position, this means a good angle to see the 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 tracks must be covered by the lens (you must see all tracks and a athlete on the outside track on the picture).

The following graphs are only valid for the objective supplied by ALGE (12,5 -75 mm, 1:1,2).

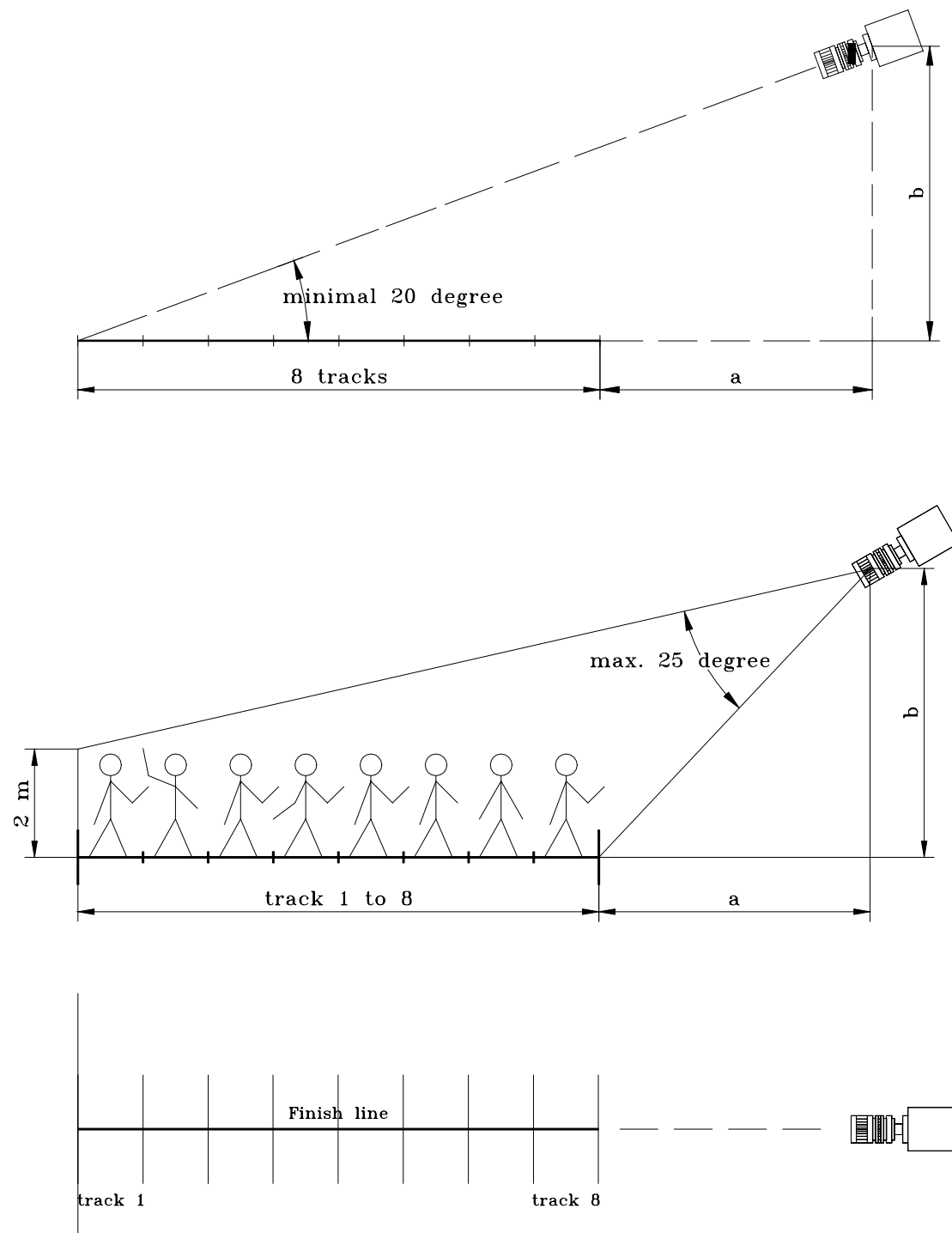"yes" in the graph means that the camera position with the shown horizontal and vertical distance is good.

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

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

A "W" in the graph means, that you will be a little bit bellow the recommended angle of 20° from the outside track to the camera.

Stadium with 6 lanes:

horithontal a

6 tracks	5 m	6 m	7 m	8 m	9 m
5 m	yes (?)	yes	yes (W)	no	no
6 m	yes (?)	yes	yes	yes	yes
7 m	yes (??)	yes (?)	yes	yes	yes
8 m	yes (?)	yes (?)	yes	yes	yes

vertical b

Stadium with 8 lanes:

horithontal a

8 tracks	6 m	7 m	8 m	9 m	9 m
6 m	yes (??)	yes(?/W)	no	no	no
7 m	no	yes (?)	yes	yes	yes (W)
8 m	no	yes (?)	yes	yes	yes
9 m	no	yes (?)	yes	yes	yes

vertical b

Alignment of the Camera for an athletic track:

The finish line must be painted correct on the track. The intersection between finish line and track borders must be black (see drawing below). This black mark is absolutely necessary, in order to see the border between the lanes on the monitor and print out. On the monitor you see the line white and the border black. If this is not the case, you do not record the finish line and you have to adjust the camera again.
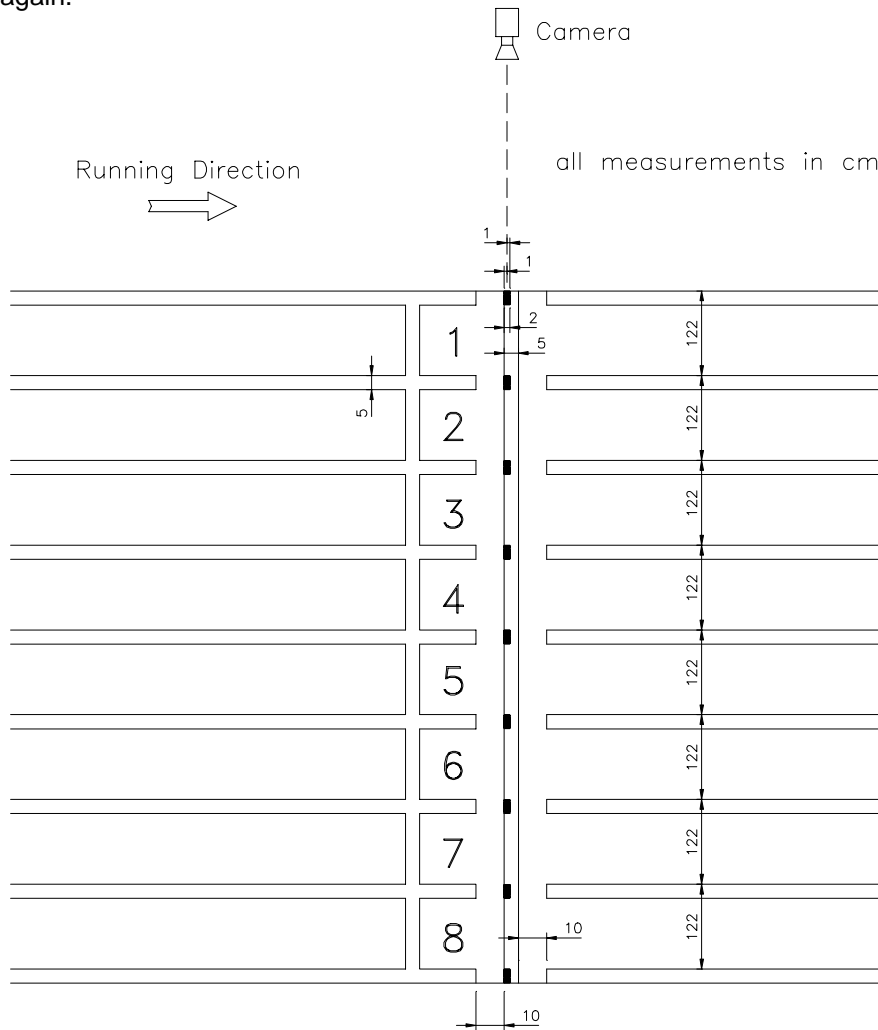
If you have the camera correct adjusted it must show the following picture in the mode "camera settings".
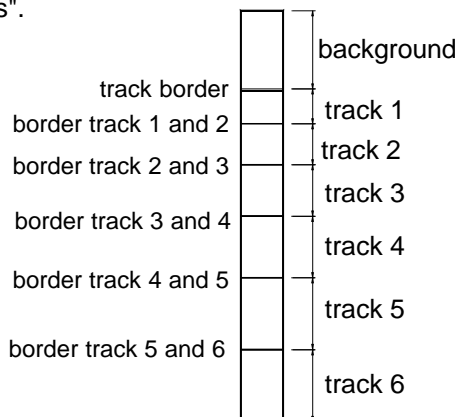
The background must have a white (bright) color in order to have a good contrast to the athletes. You must make sure that you can see a athlete as well on the track 1

At the monitor you see the track white and the lane borders black.

Camera adjustments:

- setup camera (e.g. on a tripod)
- setup all components of the OPTI system (PC, ODB1sw, OCI1sw, OLC1sw, NLG4, NBO1)
- connect all components with the proper cable
- supply all components with power
- turn PC on and start WINDOWS
- start program ALGE OPTI
- click with the mouse on "OPTIONS"
- click with the mouse on "camera settings"
- the monitor shows the picture shown below
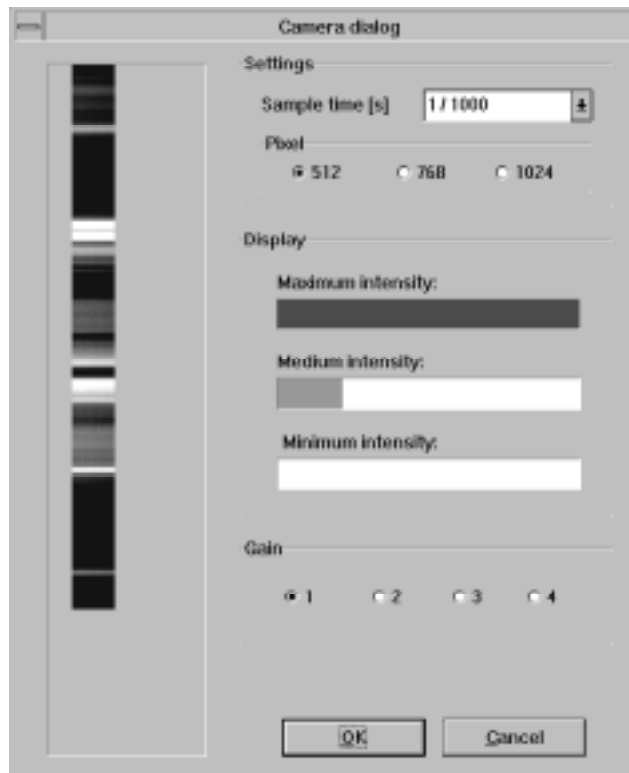
You can adjust the following at the camera lens:

Zoom Lens Cosmicar
12.5–75 mm, 1:1.2

iris
zoom
focus
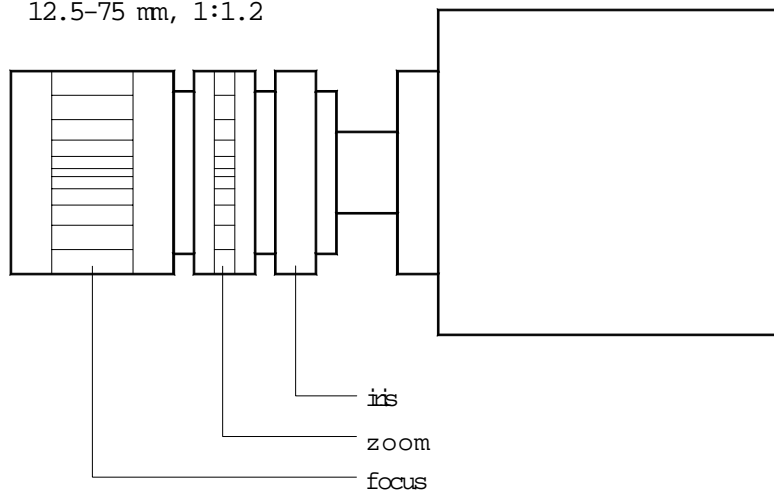
In order to make a sharp pictures you must make the following adjustments in the software and at the camera lens.

Adjustment of the sample time:

You can adjust the sample time of the camera between 100 and 1500 lines per second.

Adjustable sample times:

```
1/1500 ........ 1500 lines per second (only with 512 pixel)
1/1400 ........ 1400 lines per second (only with 512 pixel)
1/1300 ........ 1300 lines per second (only with 512 pixel)
1/1200 ........ 1200 lines per second (only with 512 and 768 pixel)
1/1100 ........ 1100 lines per second (only with 512 and 768 pixel)
1/1000 ........ 1000 lines per second
1/900 .......... 900 lines per second
1/800 .......... 800 lines per second
1/700 .......... 700 lines per second
1/600 .......... 600 lines per second
1/500 .......... 500 lines per second
1/250 .......... 250 lines per second
1/100 .......... 100 lines per second
```

To receive a good picture for athletic sprints you should use 1/1000 lines per second. For long distance races it is good to about 1/800. If you want to save space on your hard disk use a longer sample time.

With 1/1500 and 1/1400 it is only possible to work with a shorter cable 098-05. The cable with 30 meter does not work with this transmission speed. The correct cable length must be adjusted in the OPTI.INI (see point 2.4.).

If you use 1024 pixel from the camera it is not possible to use a faster sample time than 1/1000.

Adjustment of the Pixel-Amount:

When using a camera with 1024 pixel, it is possible to
choose between a resolution of 1024 or 512 pixel.

1024 Pixel: High resolution, high memory use
maximum 1/1000 sample time with 5 m cable 098-05
maximum 1/700 sample time with 30 m cable 098-30

768 Pixel: Medium resolution, medium memory use
maximum 1/2000 sample time with 5 m cable 098-05
maximum 1/900 sample time with 30 m cable 098-30

512 Pixel: Low resolution, low memory use
maximum 1/1500 sample time with 5 m cable 098-05
maximum 1/1300 sample time with 30 m cable 098-30

Adjustment of the Iris:

Adjust the iris of the lens until the picture in the bar has enough light. It is also possible to increase the brightness by using the gain.

Adjustment of the Gain:

You can increase the brightens electronically, it you have not enough light.

    1 .... gain 1 (no electronically gain)
    2 .... gain 2 (few electronically gain)
    3 .... gain 3 (medium electronically gain)
    4 .... gain 4 (maximum electronically gain)

Adjustment of the gray level:

If you adjust the iris and gain correct it should show the following picture.

maximal gray level: at the far end of the field
medium gray level: middle position of the field
minimum gray level: at the beginning of the field

If it shows a red bar, it means it is too much light. You must reduce the iris or gain.

Adjustment of the focus:

You must adjust the focus that it shows you a sharp picture. This means you should see now the lanes sharp and clear.

Adjustment of the Zoom:

Adjust the zoom that you can see all lanes and all athletes running on the lanes.

If you finished your camera adjustment, it is necessary to make a test and record a finish arrival with athletes on all tracks (especially the inside and outside track). Develop the picture and make an evaluation. Check if you can see all athletes on the picture and if the picture is sharp.

3. SOFTWARE

The software of the OPTI 1sw runs only with Windows 3.1 or higher. Knowledge about Windows is necessary to run the OPTI-software. You need a mouse to operate the software.
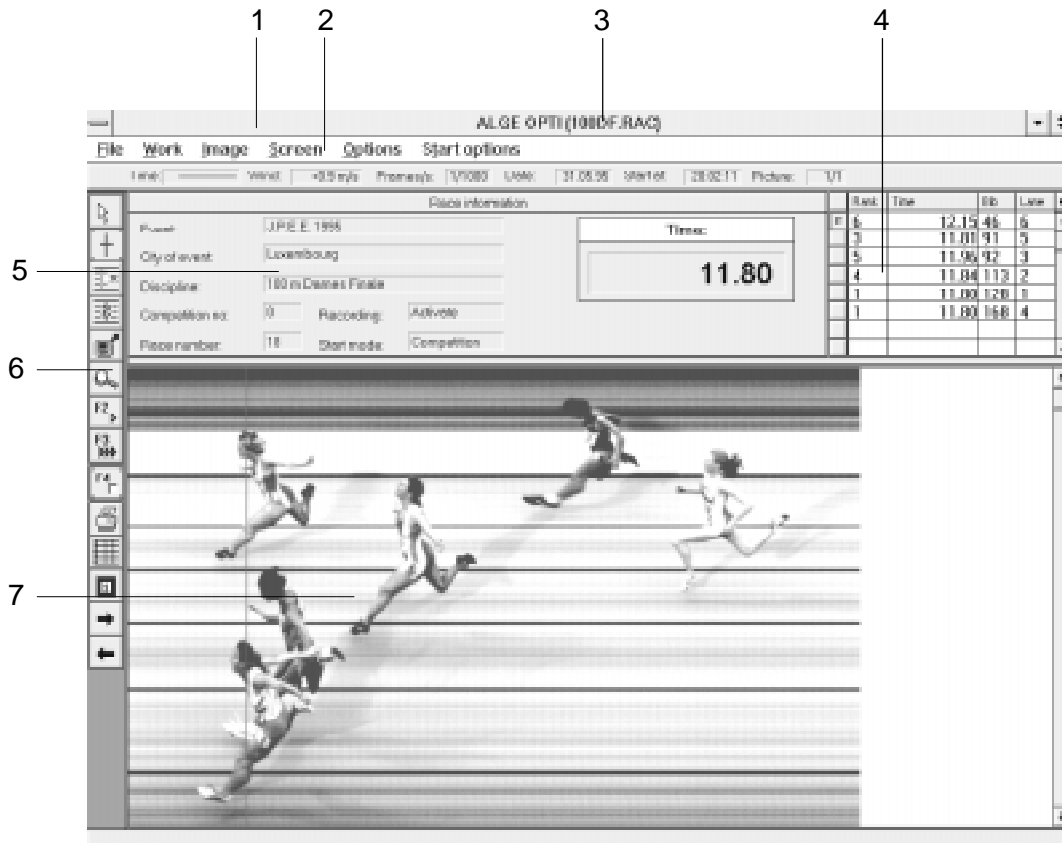
1 ..... menu list
2 ..... Information list
3 ..... File name of the race
4 ..... Competitor list (you can open it to its full size)
5 ..... Race information
6 ..... Function symbols
7 ..... Area for the finish image

3.1. Function symbols:

The most important functions are available as function symbols. You activate this when you click on the symbol. All of this functions are also available in the menu list.

(cursor arrow)	neutral setup
(cross)	manual or automatic time transfer
(table with x)	time by start number
(table with ?)	Lane identification (evaluation with tracks)
(disk with arrow)	Load (open a file)
(magnifier)	Save
F2 ▷	Zoom
F3 ▷▷▷	Start
F4 □	Activate (activate or deactivate recording)
(printer)	Print
(grid)	Competitor list
i	Race Information
→	Show next image
←	Show previous image

3.2.   Menu List:

When you click on a word in the menu list it opens the menu. You can choose between the following themes in the menu list:

File   Work   Image   Screen   Options   Start options

3.3.   Menu:

If you click on a name in the menu list, it opens the menu. Each point of the menu you can click with the mouse , if this point is active and written in black. If it is written in grey, it is not active at this time.

File

New		make a new race
Load		load a evaluated race or a prepared race
Save		store a race file
Export competitor list ...		store the competitor list
Import competitor list ...		load the competitor list
Start ...	F2	makes the system ready for a start
Start	F3	makes the system ready for 3 starts
Activate ...	F4	activate or deactivate the camera
Print		print competitor lists or images
Exit		Exit the program
Info ...		Information about the program ALGE OPTI 1sw

Work

Race-Information...	input or correct the race information
Competitor list...	input of the competitor list
Lane identification	input for lane identification

Image

Zoom	zoom image
Brightness/Contrast...	adjustment of brightness and contrast
Direct image selection...	direct selection of an image of the actual race
Mirror	mirror of an image
Stretch to client	it shows the complete image (bitmap) on the screen
Complete picture	it shows the image with all pixel in the height
Image cropping	to mark a part of the image to print it

Screen

Time line	Time line is active
Data service	Lowest line shows system data for maintenance
Timing window	Window that shows the time of the time line digital
Results board	Window that shows the competitor list
Show logo	shows logo in the picture of the screen

Options

Manual time transfer	manual time transfer to the competitor list
Lane time transfer	automatic time transfer to the competitor list by lanes
Bib time transfer	evaluation with bib number
Arrival from right	competitors arrive from the right side
Arrival from left	competitors arrive from the left side
Evaluation to COMM port	when making the result list it transmits the data to the COM port
Sending competitor list	all data form the competitor list are transmitted through the COM port
Color of time line...	color setup for time line
Precision	adjustment of the precision used in the competitor list
Camera settings...	adjustment of the camera

Start options

Competition	used for competitions
Test start	used for test of the system before a competition

3.4. Orders of the Menu:

Activate ... F4   [F4]   **File**

You can deactivate the recording before the start, this means an impulse of the photo-cell will not record a image. The system will start to record an image until you activate the system.

Use the deactivation if the competitors pass the finish line, but you do not want to record them.

e.g.: 800 m in track: each competitor must run two laps, this means the first arrival at the finish line you do not want to record, but the second (finish arrival) you want to record.

Bib time transfer   [icon]   **Options**

See chapter 6.4.3. on page 48

Brightness/Contrast   **Image**

When you load a picture and the brightness and the contrast is not good enough, try to correct it by moving the bar. On the screen you see at once the corrected picture.

Camera settings   **Options**

see page 18 to 23

Color of time line   **Options**
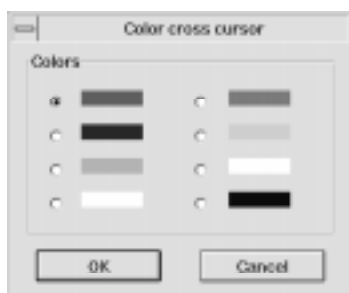
You can choose between the following colors for the time line:

- red   - purple
- blue   - turquoise
- green   - white
- yellow   - black

Coming from left   Options

Adjustment for the arrival direction. You must adjust the correct arrival direction when it is necessary to read e.g. start numbers.

Coming from right   Options

Adjustment for the arrival direction. You must adjust the correct arrival direction when it is necessary to read e.g. start numbers.

Competition   Start options

You can choose between "Competition" and "Test start". Competition is automatically active. This is what you need to time and record a race.

Competitor list...   Work

Click on the competitor list button to input the competitor list :

Start number:	numeric input, max. four digits
Lane:	numeric input, max. four digits
Name:	alphanumeric input, max. 14 characters, printed always with capital letters
Surname:	alphanumeric input, max. 11 characters, printed always with a capital letters at the beginning
Club/Nation:	alphanumeric input, max. 14 characters, printed always with a capital letters at the beginning
Age:	numeric input, max. 4 characters

- with the tab-key you move to the next field
- with the return-key you input the data on the screen to the competitor list
- the cursor jumps in the first field
- you can write over the fields for the next competitor
- click on "New" when you have input all competitors

Correct or Delete Competitor Data:
If you want to change the competitor data, you must double-click in the competitor list at the left side of the competitor. The input field of the concerning competitor opens and you can write over the wrong data or delete the competitor.

Complete picture   Image

"Complete picture" makes it possible to show the complete picture (bitmap) in vertical direction on the screen. In the standard mode you have to move the picture with the scroll bar in vertical direction.

Each picture (bitmap has 512 pixel vertically. The percentage that it shows on the monitor depends on the graphic board of the PC and the "Microsoft Windows Setup".

Data service   Screen

The "data service" is used only for testing in the ALGE factory. If you activate the data service it shows on the bottom line different system data instead of information.

Direct image selection...   Image

If you record longer than 2 seconds, it will put the image on more bitmap (pictures). The actual picture number it shows always in the information list at the right side.

e.g.: Picture: 1/5 there are five pictures (bitmap) and it shows right now the first picture.

If you input the picture number you can jump direct e.g. from the first picture to the fifth.

Exit   File

Exit from the OPTI program back to Windows.

Evaluation to COMM port   Options

Every time when you transfer a time with the right mouse button to the competitor list it transmits the data to the COM1 or COM2 of the PC. You can adjust the interface in the COMM.INI file. The output must be activated in the OPTI.INI file (see page 13).

Export competitor list...   File

You can input, save, and export the competitor list in advance. If you input it in advance, it prevents you from creating the list during the race. When you export the competitor list you must input a name.

Image cropping   Image

You can select a detail of an image to print it.

Click with mouse on "Image cropping". Move mouse to a corner of the detail that you want to print and press the left mouse button. Move the mouse to the opposite side of the detail and release the left mouse button. The detail is now marked. It shows the measurements in the middle of the detail. Store the detail by pressing the right mouse button.
In the menu "Print" you can print the cropped image.

Import competitor list...   File

You can import a competitor list into a race that you prepared before. It is also possible to create the competitor list on Microsoft Excel and import it.

Before you start the race or after you evaluate the picture you can import a competitor list. This prevents you from making the competitor list during the race.

It is also possible to import competitor lists from a old race into a new race.

Info   File

Information about the ALGE OPTI software (program version).

Lane identification   Work

Input the lane number for an automatic evaluation. This means you input the lanes from the top to the bottom. With the mouse you go to the border of the furthest lane and press the right mouse button. A window opens and you must input the lane number. Click on "OK" or press the "Return"-key.

See as well point 6.4. on page 47.

Lane time transfer   Options

See chapter 6.4.2 on page 47.

Load   File

To load a stored race from the hard disk or a floppy (old race, prepared race with start list)

The work directory that you installed during the installation c:\ALGE\WORK is shown automatically. If you want to load a file form another drive or file you must adjust it here. All files which you can load in the active directory are shown on the left side (it must be a RAC file).
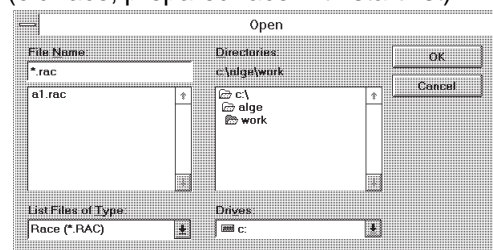
All info files made by the OPTI have as extension RAC. You need to start this file to load a race. A complete race has a minimum of four files:

```
*.RAC ...................info file for the complete race
*.BMP ...................image file(s)
*.TXT ...................text file, that includes the competitor list. You can import or export this file
                        with Microsoft EXCEL.
*.TF ......................file with stores the time.
```
This files will be stored in the directory C:\ALGE\WORK (if you have the standard setup).

Manual time transfer   Options

See chapter 6.4.1. on page 47.

Mirror   Image

You can mirror each picture. A mirror picture has the time line (x-direction) into the opposite direction.

original picture   mirror picture

New   File

If you want to start a new race, you must click on "New". This opens a window and you must input the name for the race (max 6 digits).
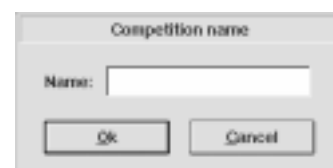
Precision   Options

You can adjust the precision to 1/10, 1/100 or 1/1000 seconds. You make the adjustment by clicking on the circle next to the value that you want to adjust.

If you have a sample time of 1/100 you can only choose between a precision of 1/10 or 1/100.

If you have a manual start (manual start with mouse or keyboard) it takes automatically a precision of 1/10 seconds. In this case it is impossible to change to a higher precision (law of the IAAF, International Amateur Athletic Federation).

Print   🖶   File

You can print the following lists or pictures:

o **Start list:**
   Start list which you print before the race (example on page 60)

o **Results list:**   Ranking list with competitors of the race (example on page 62)

o **Results list by lane:** Ranking list of race sorted by lane (example on page 64)

o **Times taken by photocell:**
   Prints all photocell times (example on page 66)

o **Image:**
   Prints the image. It is possible to print the image with time line and time or without.
   - *Image with time:*
      all times which are listed in the competitor list are shown on the printed image (example on page 68)
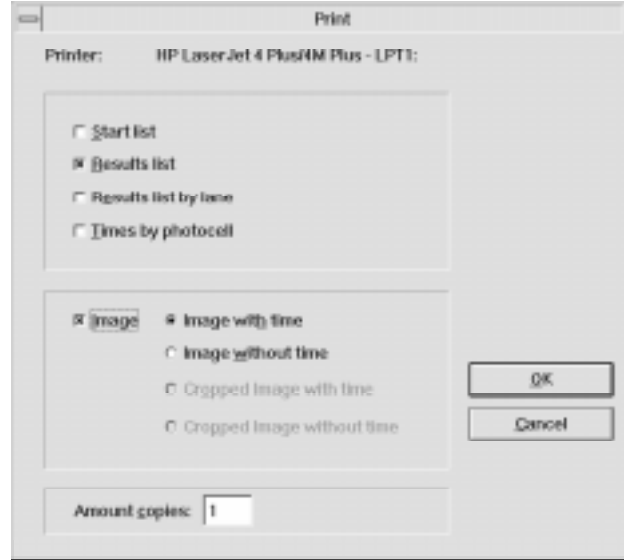   - *Image without time:*
      it prints just the image without time (example on page 69)
   - *Cropped image with time:*
      A cropped picture (see page 30) will be printed (example on page 70).
   - *Cropped image without time:*
      A cropped picture (see page 30) will be printed (example on page 71).

Race-Information...   ℹ   Work

The race information describes a race. The race information is also printed in the head of each list. You can input the race information for each separate race or leave it for all races the same.

Event:
   max. 47 alphanumeric characters

City of event:
   max. 27 alphanumeric characters

Discipline:
   max. 47 alphanumeric characters

Competition Number:
   max. 3 numeric characters

Race Number:

        max. 3 numeric characters, the number will be increased automatically by one as soon as you input a new name for a race.

Wind (m/s):

        You can input the wind data after the race. The wind data needs a (+) or (-) before the numeric value. The value consists always of two digits, separated by a decimal point.

Results board on/off   Screen

If you use the function "Complete picture" it is possible to move the competitor list all over the screen. You move the competitor list by moving with the mouse into the middle of the window. Now press the left mouse button and move the window to the position you like.

You can fade out the competitor list, if the "Complete picture" is active. To fade out the competitor list press on "Result board on/off". To fade in the competitor list click on "Result board on/off" again or click on "Complete picture".

Save   File

It is possible to store the actual data of the race any time. As file name it takes always the name that you must input to prepare a race. If you have not input a name by now it will ask you automatic to input the file name (e.g. when you prepare a competitor list).

The file name can have a maximum of 6 alphanumeric figures.

Sending the competitor list   Options

The transmission of the complete result list through COM1 or 2. You can adjust the interface in the COMM.INI file. The output must be activated in the OPTI.INI file (see page 14 and 17).

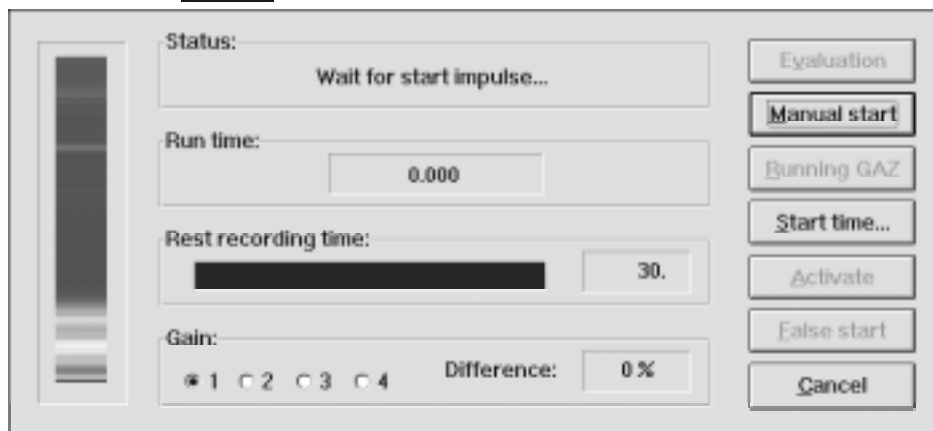## Show logo   Screen

You can show the ALGE logo in the centre of the picture at the monitor. In order to show the logo you must activate the logo in the OPTI.INI file (bShowLogo=1). If you have it on zero, it deactivate the logo. The logo is shown as soon as you have the mouse in the picture area.

Start ... F2   F2 ▷   **File**

Before you start a new race, you must activate the start dialogue. You can activate the "Start...F2" by pressing the F2 key, clicking with the mouse on the "F2"-button", or use the menu.

Status: Tells if the time is already started or not.

Run time: Shows the run time. Each stop impulse (photocell) stops the run time. It is possible to show the running time again, by clicking on "Running GAZ" with the mouse (e.g. after an intermediate time).

Rest recording time: Shows the time remaining in seconds that you can record.

Gain: You can increase the brightness electronically (see page 23)

Difference: Difference of the brightness in % to the previous camera adjustment. If the difference is higher than 30% the frame of the window starts to blink. The actual picture is shown on the left side of the window.

Evaluation: Click on this button to show the picture after the last competitor arrived at the finish. When you press this button, you cannot record another athlete.

Manual start: Click on this button to make a manual start. If you make a manual start it takes automatically the precision of 1/10 seconds.

Running GAZ: Click on this button to show the running time again (screen and display board). You need this option e.g. for long distance races with intermediate time.

Time offset: You can input any time (hours, minutes, seconds) and start the clock form this time (instead of zero). You can use it to synchronize the OPTI with other timing devices.

Activate: If you deactivate the recording, you can click on this button to activate the recording again (see on page 28, Activate F4).

False start: Click on this button after a false start. The clock goes on 00:00.000 and the system is ready for the start.

Cancel: Cancel the Start mode by clicking on this button. Cancel is only possible, if you have not recorded a image.

Start 3 Races   F3   [F3 ▷▷▷]   **File**

If you press the key <F3> you can start up to three different races before you evaluate.

This is very important for rowing and canoeing competitions. This mode can also increase the evaluation and start procedure for athletic.
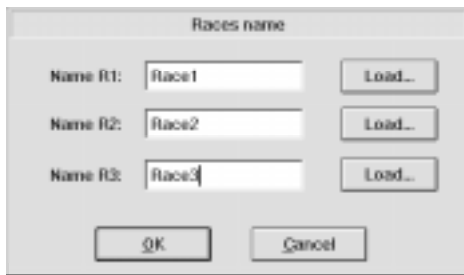
Up to three races are started:
Before one race ends you can start two other races. It is also possible to evaluate races when other races are running.

Evaluation while an other race starts:
You can evaluate a race, and during the evaluation another race will start. This function may increase breaks between the end of one race and the start of the next race (manly used for long distance races in athletic).

If you press the key <F3> it shows the following picture on the screen:

You have to input or load the first three race names (file names). Click the button "OK" after the input.

The OPTI is now ready for the start:

The different functions you can see in chapter 5.2. on page 42.

Stretch to client   [+]   **Image**

If you click on "stretch to client" it shows the complete picture (bitmap) on the screen (Attention: the image may consist of more than on picture). This function is for orientation only. It is not possible to take a time in this mode.

Time line   Screen

For the evaluation you need to have this mode active. This mode shows you the time line and the time (digital) on the screen, as soon as you click on the image.

Test start   Start options

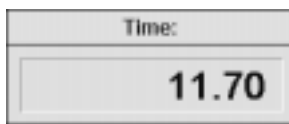You can choose between "Competition" and "Test start". Pre adjusted is always "Competition". If you activate "Test start" it switches automatically after the evaluation of the test start back on "Competition".

Use "Test start" to proof the system before the competitors start.

Timing window on/off   Screen

Time:
11.70

The time is shown at the left side of the information list. If you want to show the time in a separate movable window activate the timing window. Now you see a window with the time on the screen. This window you can move all over the screen.

Attention: The time window shows no time until you move the time line. The precision of the timing window depends of the adjustment of the "Precision" in the menu "Options".

Zoom   Image

It is possible to zoom any picture. The zoom factor is 2, 4 or 8. It is possible to show the time line and time as well in the zoom mode.

- Click on the magnifier glass (Zoom, function symbol)
- Move the mouse to the position that you want to zoom
- Press the left mouse button to enlarge
- Press the right mouse button to reduce (smallest picture is original)
- To show the time line in an enlarged picture you need to return into the "time line" mode.

4.   PREPARE A RACE

Before you start to record a race it is useful to prepare the race. You should input the file name, race information, and competitor list. If you input this data, you will have it easy to make evaluation quick and print the complete result lists.

4.1.   File Name of the Race:

You need input a name for each race. This name is allowed to have a maximum of 6 characters. The program asks automatically to input the file name, when you click on "New" in the menu "File", when you load the first time the "Race information", or when you click on the "Start F2" button. It shows the file name always in the top line next to ALGE OPTI.

4.2.   Race Information:

Input the race information. You can input everything in advance, except the wind data (see page 33).

4.3.   Competitor List:

You should input the competitor list before the race. All necessary information about each competitor you must input (see page 29).

5.   RECORD A RACE

You can record races in two ways:

-   *Start F2:*   you can record each race complete independent

-   *Start 3 Races F3:* You can make up to three races at the same time. The evaluation is possible when other races are running.

5.1.   Start F2:

If you have the race prepared in advance, you must load it (see Load on page 31).

To record a race you need to click on the "F2" button (function symbol) or press the F2-key. Now it opens the following window:
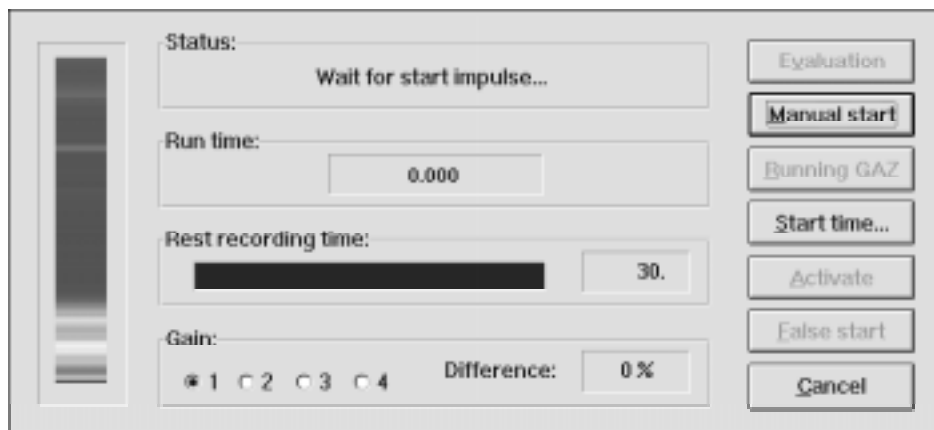
5.1.1.   Status:

It may show the following text:

Before the start:	Wait for start impulse...
After the start:	Start detected
After a stop impulse:	Display board is stopped!
After you click on the button "Running GAZ":	Display board is running!
After you click on the button "False start":	False start confirmed

5.1.2.   Run Time:

Here it shows the running time. The precision shown depends on the adjusted precision (see page 32).

Before the start it shows the time zero. After the start impulse you see a running time. After the first stop impulse (photocell or hand switch) it stops the time and shows the run time. If you want to show the running time again click on "Running GAZ".

5.1.3.   Rest Recording Time:

This shows you how long you can record a race. You can record up to 30 seconds (maximum 10 seconds continues operation (without recording interruption)).

5.1.4. Gain:

After the start you can change the gain to adjust the brightens. Preferable you should you the iris to control the brightness. If possible use gain only on position 1 or 2. The actual picture is shown on the left side of the window. As soon as the system starts recording it locks the gain.

5.1.5. Difference:

It shows the difference of the actual brightness conditions compared to the camera setup conditions. The shows the value in percent. Darker conditions it shows negative, brighter positive. If the chance of the brightness is more than 20% it beeps and the window starts to blink. The picture at the left side of the window shows the actual picture form the camera. This allows you to adjust the camera even after the start.

5.1.6. Start Time:

You can start a race from zero or from any time that you input. To input a start time click with the mouse on "Time offset". It opens a new window where you input the time:
-   input the time with the keyboard
-   change from hours to minutes or seconds with <TAB>
-   if you have set the correct time click with the mouse on OK.

5.1.7. Manual Start:

It starts the time, If you click on the button "Manual start". Since a manual start is never very precise, it has always a precision of 1/10 seconds. This is a IAAF rule.

5.1.8. False Start:

If there is a false start, you can reset the clock to zero by clicking on "false start". The system asks if you want to confirm the false start and sets the clock to zero for a new start.

5.1.9. Running GAZ:

If you click on the button "Running GAZ" when the time stops, it shows the running time again. The time shown in the "F2" menu is always shown on the display board.

5.1.10. Activate:

If the field "Activate" is active, the recording was deactivated with the "F4" key before the race. As long as the recording is deactivated it will not record with a stop impulse. As soon as you click on "Activate" it is ready to record and will record a finish arrival controlled by the next stop impulse.

The condition of the recording "Activate" or "Deactivate" is always shown in the race information on the screen.
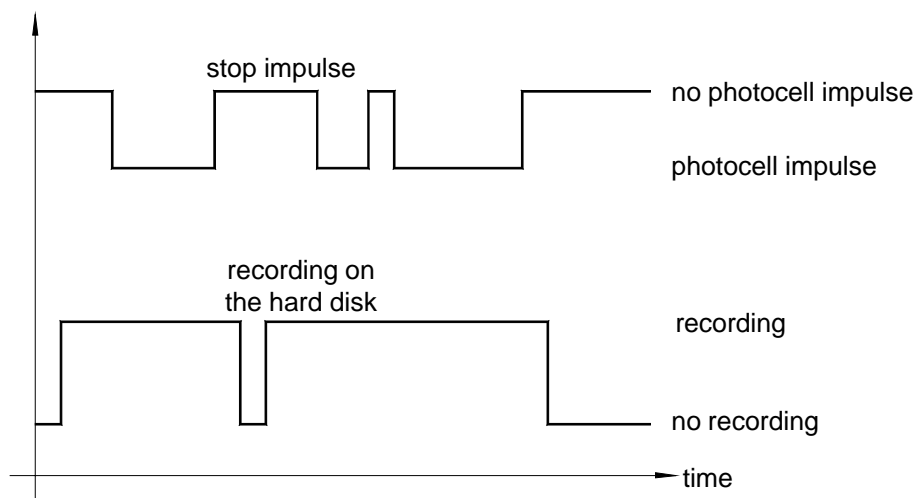
5.1.11. Recording:

The recording is controlled by a stop impulse. As device controlling the recording you can use a photocell or hand switch.

The photocell has the advantage of a precise recording. It records only if somebody interrupt the photocell. This guarantees short recording times, which means that it does not need much space on the hard disk. The evaluation is also faster if you have short files.

The recording starts automatically 0.160 seconds before the beginning of an stop impulse (pre recording time) and ends 0.09 seconds after the end of an stop impulse (after recording time) (sample time is 1/1000). It records every stop impulse until you click on the "Evaluation" button or 30 seconds of the rest recording time are full.

After the 2nd photocell impulse it continues to record, because the recording break is shorter than the pre recording time and the after recording time.

5.12. Evaluation:

5.2.   Start 3 Races:

If you press the key <F3> you can start up to three different races before you evaluate.

This is very important for rowing and canoeing competitions. This mode can also increase the evaluation and start procedure for athletic.

Up to three races are started:
Before one race ends you can start two other races. It is also possible to evaluate races when other races are running.

Evaluation while an other race starts:
You can evaluate a race, and during the evaluation another race will start. This function may increase breaks between the end of one race and the start of the next race (manly used for long distance races in athletic).

If you press the key <F3> it shows the following picture on the screen:

You have to input or load the first three race names (file names). Click the button "OK" after the input.

The OPTI is now ready for the start:

Using the F3-Window is always very complex. You must always control very careful that its starts and records the correct race. If it is possible use the F2-window, because it is much easier to operate and not has not so many possibilities to make mistakes.

5.2.1. Races:

This is the control field for the start and finish. You must set, which race starts next (S1, S2, or S3), and the race that you want to record (F1, F2, or F3). Each race has a clock which starts with the start of the race. Next to the finish pointer it has a field showing the status of the race and the race name (file name).

Status of races:

1:43.619	○ S1	● F1	has recorded !	⟨Race1⟩
24.	○ S2	○ F2	is started !	⟨Race2⟩
0.000	● S3	○ F3	is waiting for start impulse !	⟨Race3⟩

is ready: Race is loaded, but not started. Start pointer is set for another race.
is waiting for start impulse: Race is loaded, but not started. Start pointer is set for this race.
is started: Race is started, but not recorded.
has recorded: Race has a recorded finish arrival.

Race name: It shows the race name (file name) at the left side of each status line (see picture above e.g. Race1, Race2, Race3).

Start pointer (S1, S2, S3): The start pointer shows, which race starts next. If you have a false start, you need to set the start pointer on the race with the false start. The start pointer jumps after each start to the next race that is not started.

Record pointer (Z1, Z2, Z3): The record pointer shows for which race it records. After it records, it is not possible to move the record pointer to another race, until you press "Evaluation". You can select only started races.

Running time: It shows the running time for each race in the three field below "Races". After each photocell impulse it stops the time. If you press the button "Running GAZ" it shows again the actual running time.

5.2.2. Rest recording time:

Shows the time remaining in seconds that you can record.

You can record with 512 pixel and 1000 lines per second between 30 and 300 seconds (depending on the adjustment of the OPTI.INI file). The continuous recording time (without recording interruption) is about 24 seconds.

5.2.3. Gain:

You can adjust the brightness electronically, but is possible use the iris of the lens to adjust the brightness. If possible use the gain never on three or four (poorer picture quality). It always shows the actual picture on the left side.

5.2.4. Difference:

Difference of the brightness in % to the previous camera adjustment. If the difference is higher than 30% the frame of the window starts to blink. The actual picture is shown on the left side of the window.

5.2.5. Status:

Before the start:	Wait for start impulse...
After the start:	Start detected
After a stop impulse:	Display board is stopped!
After you click on the button "Running GAZ":	Display board is running!
After you click on the button "False start":	False start confirmed

5.2.6. Reload:

If it shows an X in this field you must load a new file for every evaluation. If you click on this field the X will disappear. This means that it does not reload races when you make the evaluation.

5.2.7. Prepare:

If you click on evaluation you have to input or load the file name for a new race. You can input this file name in advance by clicking on prepare.

5.2.8. Manual start:

Click on this button to make a manual start. If you make a manual start it takes automatically the precision of 1/10 seconds (IAAF rule).

5.2.9. Running GAZ:

Click on this button to show the running time again (screen and display board). You need this option e.g. for long distance races with intermediate time.

5.2.10. Start Time:

You can input any time (hours, minutes, seconds) and start the clock form this time (instead of zero). You can use it to synchronize the OPTI with other timing devices.

5.2.11. Close:

If you evaluate a race, you can see in the lower left corner the F3 button with the file name and time of the next active race. If you make a double click on this button, you will come back to the F3-Window.

If you want to leave the F3-Window click on "Close". To go back into the F3-Window double click the F3-button.

5.2.12. False start:

If you have a false start you must activate the correct race with the start pointer. Reset the clock to zero by clicking on "false start". The system asks if you want to confirm the false start and sets the clock to zero for a new start.

5.2.13. Cancel:

Cancel the F3-mode by clicking on this button. You can cancel the F3 mode at any time. If you have already a recorded race it will make this evaluation. It will quit a started race.

5.2.14. Recording:

It records always the race that you have set with the record pointer (see page 41, chapter 5.1.11.)

5.2.15. Evaluation:

Click on this button to show the picture, after the last competitor arrived at the finish. When you press this button, you cannot record another athlete for this race (see next page, chapter 6).

6.   EVALUATION

If a race is recorded you can show it on the screen by clicking on "Evaluation". Depending on the type of computer it takes between 2 and 20 seconds to develop and load the picture.

6.1.   How do I show the different pictures on the screen:

During the recording it writes all data on the hard disk (IF-file). When the race is stored on the hard disk you must develop the picture (transfer to bitmap format).

If you record longer than 2 seconds it splits the image in different bitmap. Each picture (bitmap) contains about 2 second recording time.

If you click on "Evaluation" in the "F2" menu it will show you the first picture on the screen. Now you can use the scroll bar to move the picture horizontally and vertically. If you want to go to the 2nd picture you click on the ⊟ button. Now it loads the second picture.

With the button ⊟ you jump to the previous picture.

In the menu "Image" you find "Direct image selection". With this function it is possible to input the picture direct. The picture number of the bitmap shown on the screen is always in the right upper corner.

6.2.   Time line on the Screen:

If you move the mouse into the picture and press the left button of the mouse it shows the time line. You can move the time line as long as you press the left mouse button. If you want to move the time line pixel by pixel (line by line) you your the arrows of the keyboard.

6.3.   Timing Window:

You have the possibility to choose between two was to show the time of the time line. Either it shows the time on the left side of the information list, or you open a separate window.
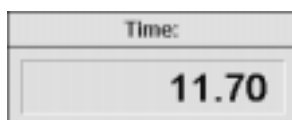
Time:
11.70

If you want to open a separate window for the time click on "Screen" and "Timing window on/off". This timing window you can move to any position of the screen. If you have the timing window active, it will show you in the information list no time.

6.4.   Transfer run times into the Competitor List:

There are two possibilities to transfer the run times to the competitor list:
- Manual time transfer
- Lane time transfer
- Bib time transfer

Choose the "manual time transfer" if you evaluate neither with lane, nor with bib

Choose the "lane time transfer" if every competitor has its own lane (e.g. track sprint, rowing)

Choose the "bib time transfer" if you evaluate with bib (e.g. cycling, horse races)

6.4.1.   Manual time transfer:
Mark the competitor in the competitor list which you evaluate (click with mouse on left side of the competitor listing the empty field before rank; the competitor must be marked with a green point). Move the time line to the position that it shows the time of the competitor. Press the right mouse button to transfer the time to the competitor list.

6.4.2.   Lane time transfer:
Input the lane number for auto time transfer. Input the lane number from the top to the button. Move with the mouse to the position where the top lane ends and press the right mouse button (see picture). It opens a window and you have to input the lane number. Press the "Return"-key or click on "OK". You can input a maximum of 10 lanes. It does not matter if lane 1 is at the top or bottom.
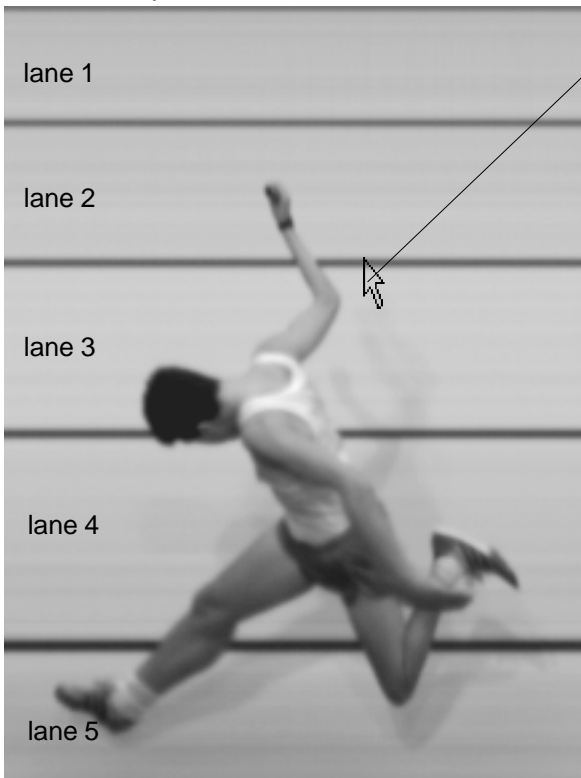
Click with the right mouse button on the border of the lane. It opens a window where you can input the lane number.
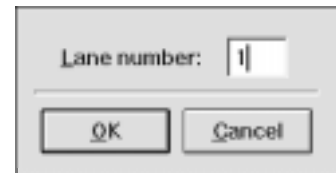
Evaluation with auto time transfer:
Move the mouse into the picture. If you press the left mouse button it moves the time lane and shows the lane number. Move the time line to the correct position. Move to the correct lane (up or down with the mouse). Press the right mouse button to transfer the time into the competitor list.

6.4.3.   Bib time transfer:

You use "bib time transfer" if you input can read the bib numbers of each competitor (e.g. cycling, horse races, track long distance races, etc.) This mode is active if you press the third button of the function symbols.
- press the left mouse button and move the time line to the first competitor
- click the right mouse button
- it opens a window
    o input bib with keyboard
    o click with mouse on OK
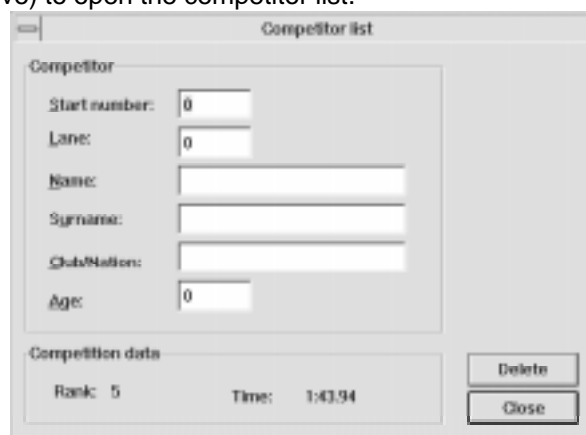- press left mouse button and move the time line to the next competitor
- etc.

If you cannot read a bib number:
- press the left mouse button and move the time line to the competitor
- click the right mouse button
- it opens a window
    o input X with keyboard
    o click with mouse on OK
- for this time it made now a new entry for the competitor list. This entry has only rank and bib (see picture below, last lane)

- If you know the start number of the competitor at a later time, double click with the left mouse key (as shown above) to open the competitor list.

- If you input the correct bib number it shown the following window if you have already a competitor in the list with the same bib.

- If you click YES, it gives the time to the existing bib, and clears the new entry.

Group time for cycling:

You must always evaluate the first cyclist of a group first. The time of the first entry of a group goes to the rest of the group as well.

- press the left mouse button and move the time line to the first competitor of the group
- click the right mouse button
- it opens a window
    o input bib with keyboard
    o click with left mouse button on "Group time"
    o click with mouse on OK
- each additional competitor of the same group has the same time. The ranking goes by the real time.
- for the first competitor that is not in the same group you must click on "Group time" (it must show no X).

If two groups are behind each other, you must click with the mouse two times on "Group time" when inputting the time for the first competitor of the second group .

6.5.   Returning to the F3 Window:

If you record a race in the F3-Window, it will show in the evaluation the F3-button with the actual race name and running time of the next race.

When you finish the evaluation you can return to the F3-Window by double click the F3 button.

6.6.   Hints for the Evaluation in the F3-Mode:

You are not allowed to load pictures short before racers of another race arrive at the finish. During the finish arrival you need the hard disk 100 % for the recording.

It is possible to have a start during the evaluation of a race. The time of the new started race starts to run in the background (or under the F3-button) and you can continue as usual with the evaluation.

If you have a finish arrival while you evaluate a race, it will stop the evaluation and jumps to the F3-Window. The evaluation you can continue at a later point.

7.   OPTI SYSTEM COMPONENTS

7.1.   OPTI Line Camera:

The Line Camera is delivered with a hood that protects the camera form rain. If you have wind and rain additional protection for the camera, lens and its plugs are necessary.

7.1.1.   OPTI Line Camera OLC1sw:
Line Camera with 512 pixel resolution. This is the standard camera. Connect the camera with cable 099-01 with the Camera Interface OCI1sw. With this camera you receive the cable 098-30 (30 m cable).
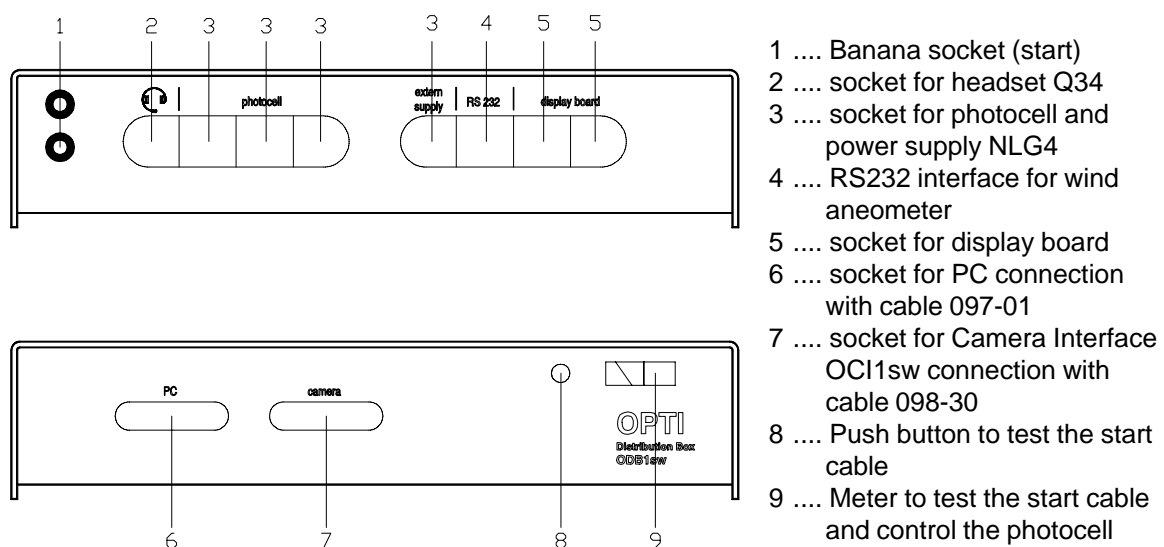
7.1.2.   OPTI Line Camera OLC2sw:
Line Camera with 1024 pixel resolution. This camera we deliver on request. Connect the camera with cable 099-01 with the Camera Interface OCI1sw. With this camera you receive the cable 098-05 (5 m cable).

7.2.   OPTI Camera Interface OCI1sw:

Connect the Camera Interface OCI1sw and the Camera with cable 099-01. Connect with cable 098-30 or 098-05 (see above) the Camera Interface OCI1sw and the Distribution Box ODB1. Connect as well the Net-Battery-Device NBO1 with the Camera Interface OCI1.

You must protect the OCI1sw from rain.

7.3.   OPTI Distribution Box ODB1:

1 .... Banana socket (start)
2 .... socket for headset Q34
3 .... socket for photocell and power supply NLG4
4 .... RS232 interface for wind aneometer
5 .... socket for display board
6 .... socket for PC connection with cable 097-01
7 .... socket for Camera Interface OCI1sw connection with cable 098-30
8 .... Push button to test the start cable
9 .... Meter to test the start cable and control the photocell

The Distribution Box ODB1 connects the PC with all other timing components. You need to connect the following devices to record a race:

Power Supply NLG4:   use one of the four sockets (3) to connect the power supply
PC: use socket (6) with cable 097-01
OPTI Camera Interface ODB1sw: use socket (7) with cable 098-30

1 ...... Banana socket:
2-wire connection to the start. This wire is used to transmit the start impulse as well as the speech connection.

2 ...... Socket for headset Q34:
Connect here the headset Q34. The headset allows the operator of the OPTI to talk with the starter.

3 ...... Socket for Photocell and Power Supply NLG4:
Four identical sockets to connect the photocell and power supply NLG4.

4 ...... RS 232 interface to connect a wind aneometer:
You can connect the following wind aneometers:
-    Sports Aneometer from Nordic or Gill Instruments
     (from Version OPTI 2.6; the ODB1 must be adapted for 300 Baud)

5 ...... Socket to connect the Display Board GAZ4:
Socket to connect the ALGE Display Board with cable 010-10

6 ...... Socket for PC connection (ALGE Computer Board OCB1):
Socket for PC connection with cable 097-01 (connect at the plug of the OPTI Computer Board OCB1)

7 ...... Socket to connect the Camera Interface OCI1sw:
Socket for the Camera Interface OCI1sw connection with cable 098-30 (or 098-05).

8 ...... Push button to test the start cable:
To test the start cable arriving at the banana socket (1). To make this test you need to supply the ODB1 with the NLG4.

Short-circuit-test:	-	cable is open (unplugged) on the start side
	-	press push button (8)
	-	needle of meter (9) must stay in the middle of the green area (otherwise short-circuit)
Resistance test:	-	short the cable pair on the start side (press banana plugs together)
	-	press push button (8)
	-	needle of meter (9) must go to the far right side (otherwise is the resistance too high; maximum 2000 Ω loop resistance). The needle is about 1 mm from the right edge with 2000 Ω.

9 ...... Meter:
-    to test the start cable (see above)
-    to check the supply (voltage check)
-    **photocell check**: The adjusted photocell must show the meter in the green field. If the photocell is not adjusted or interrupted the needle starts to swing.

7.4. Startmicrophone SM7, Speech Amplifier SV3/SM and Headset Q34:
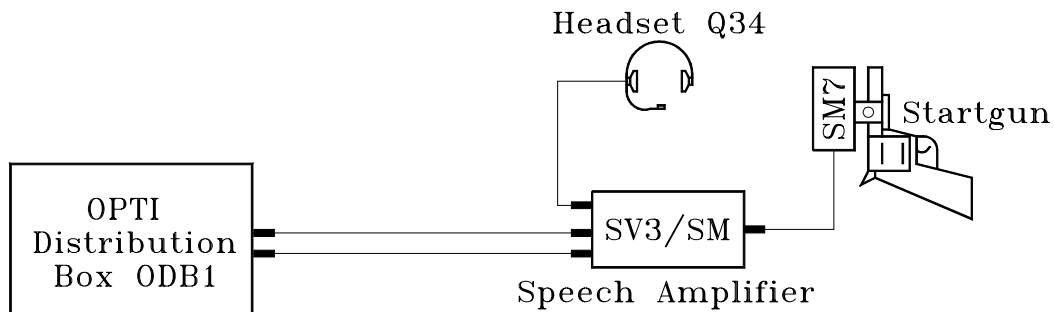
Startmicrophone SM7:

The Startmicrophone SM7 is needed to change the sound of the startgun into an electrical impulse, which starts the OPTI timer. The soft part of the SM7 must be as close as possible to the point where the startgun makes the most noise. With the screw you can fasten the SM7 at the barrel of the startgun. Be aware that the cable does not pass the area where the flame of the shoot burns it.

You need to keep the startgun always clean. Dirt may prevent the noise to trigger the SM7. The ammunition of the startgun must be stored on a dry place.
The ammunition should not be older than one year.

**Speech Amplifier SV3/SM and Headset Q34:**

The Speech Amplifier SV3/SM and Headset Q34 is used to have a speech connection between the starter and the operator of the OPTI-timing-device. Built into the SV3/SM is a 9 Volt battery. If this battery becomes empty you can hear a ticking in your head set. If you change the battery you need to open the four screws on the backside.

Attention: At the end of an event you need to unplug the Headset and Startmicrophone. This turns the Speech Amplifier automatically off.

Connect the SV3/SM with a 2-core cable (e.g. KT300) at the Distribution Box ODB1 (1). Take care of the polarity of the cable. The polarity is right, when the LED of the SM7 blinks.
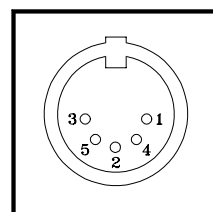
> *Socket to connect the Startmicrophone SM7:*
> 1 ...... signal-output, open collector; max. 12 V / 50 mA
>   impulse duration: low = ca. 100 ms
> 2 ...... empty
> 3 ...... ground
> 4 ...... +6 to 15 Volt;   0,6 mA (from SV3/SM)
> 5 ...... +5 Volt stabilized;   0,4 mA (from ODB1)
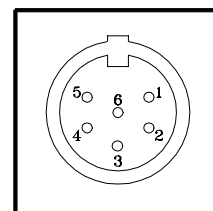
> *Socket to connect the Headset Q34:*
> 1 ...... microphone of headset
> 2 ...... common ground
> 3 ...... earphones of headset
> 4 ...... empty
> 5 ...... empty

7.5.   Photocell:

The photocell of the OPTI has two main functions:

- *It controls the recording of the Camera OLC1sw or OLC2sw:*
    Through the impulse of the photocell it starts to record. In the OPTI.INI file you can adjust how many lines you want to record before and after the photocell impulse. You can also control the recording with the software button "Activate F4" (see page 28) or with a On/Off-switch for the photocell.
    If you use the software button "Activate" the photocell is still functioning for the display board. If you use a On/Off-switch you can switch the photocell manually on or off.

- *It stops the unofficial time for the display board:*
    Through the impulse of the photocell it stops the time and shows the time on the display board (unofficial winner time).
    If you press the Software Button "Running GAZ" it shows on the display board the actual running time. If you deactivate the recording it will still show you the time from the photocell on the display board.
    If you use a On/Off-switch you will have only the running time on the display board until you turn the switch on and somebody interrupt the photocell.

7.5.1.   Reflection Photocell RLS1c:

The ALGE photocell RLS1c is made with most advanced electronic. You can use the reflection photocell RLS1c for a distance from 1 to 25 Meter. If you need a longer distance than 25 Meters you have to use the type RLS1cd, which consist of a transmitter and receiver.

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 (RLS1cd) has on one side a transmitter and on the other the receiver. The infrared beam goes direct form the transmitter to the receiver.
Types of Photocells:
RLS1c   Infrared reflection photocell
RLS1cd   Infrared photocell with separate transmitter and receiver
RLS3c   Three-fold-photocell for track and field

**Power Supply for the Photocell RLS1c:**
The photocell is supplied by a 3-core cable from the Distribution Box ODB1, or by the internal battery. As internal battery you can use a *Alkaline Baby Battery* or a *NiCd Baby Rechargeable Battery*. If you work with the internal battery you can use a 2-core cable between the timing device and the photocell (e.g. ALGE cable reel KT300 with 300 m fieldtelephoneline)
The internal battery supplies the RLS1c for:
    Alkaline Baby Battery: about 40 hours
    NiCd Baby Rechargeable Battery: about 18 hours
The internal battery of the RLS1c is automatically turned on by plugging cable 027-02 (the case of the plug is connected with ground). If you do not use the photocell, unplug the cable. Otherwise the photocell is not turned off.

Input of the battery: Press down to open battery compartment
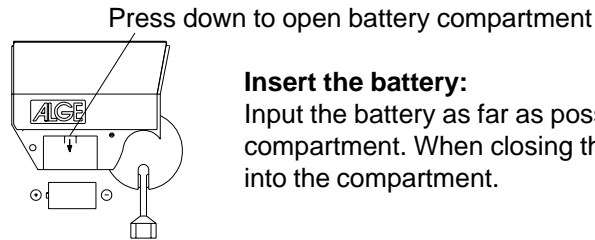
Insert the battery:
Input the battery as far as possible into the battery compartment. When closing the cover press the battery into the compartment.

Alkaline 1,5V Baby Battery or NiCd 1,2V Baby Rechargeable Battery

Adjustment of the Photocell RLS1c:
- 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 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.
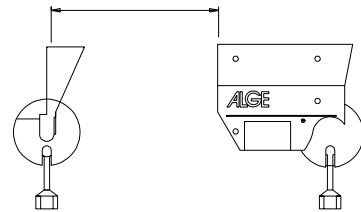
Weather Cover:
You can move the weather cover in order to protect the lens from snow and rain. The lens should be protected during timing.
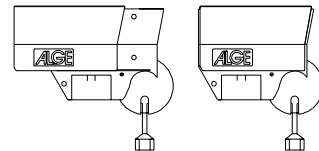
Technical Data of the Photocell RLS1c:
Power Supply:	5 VDC / 25 mA max. or internal battery (baby)
Max. Distance:	0,5 to 25 Meter
Output:	NPN transistor, open collector, active low
Reaction Time:	300 μs, 2 ms adjusted
Impulse length:	20 to 1400 ms adjustable
Measurements:	160 x 135 x 58 mm
Weight:	0,6 kg

Plug Pin Connection:

1 .... Signal output
2 .... Signal output
3 .... 0 Volt
4 .... empty
5 .... +5V stabilized
Case Ground .... negative pole of battery
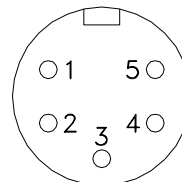
Photocell RLS1c with internal battery:

Working time: about 40 hours with alkaline battery
                         about 18 hours with rechargeable battery

7.5.2. Three-Fold-Photocell RLS3c:

This photocell is specially developed for athletic. It consists of three reflection photocells mounted above each other. When all three photocells are interrupted at the same time, makes the photocell an stop impulse. This guarantees you that the arms or legs of an athlete cannot produce an photocell impulse. The photocell controls the OPTI recording and the stops the time of the display board.

Adjustment:
- 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 OPTI (this means you do not have to cross the track with the cable).
- The photocell is not allowed to cover parts of the picture. Therefore you might have to place the photocell one or two meters away from the edge of the lane or place it a little bit before the finish line.
- Plug red cable 001-30 into photocell and Distribution Box ODB1 (photocell 3).
- Make the OPTI system work (turn the computer on and supply the ODB1 and OCI1sw)
- Open the ball-and-socket-joint and adjust the photocell to the reflector. Use for the adjustment the sight hole 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 the meter (9) of the Distribution Box ODB1 starts to swing.
The photocell and the reflector should be blocked off, so that no one can knock it during the race.

The RLS3c has two identical sockets for connection to the OPTI. They have the same like of the RLS1c.

7.6. Power Supply NLG4:

The NLG4 supplies the Distribution Box ODB1. Plug the NLG4 at the mains, and at ODB1 (power supply 3). If the supply for the ODB1 is all right, the meter (9) must be in the green area (do not connect a photocell for this test).

There is a version of the NLG4 with 230V/50Hz and one with 120V/60Hz.

7.7. Net-Battery-Device NBO1:

The Net-battery-Device NBO1 supplies the camera interface OCI1sw and the camera. You can plug the NBO1 to the mains or with cable 032-05 to a 12V car battery. Plug the other cable of the NBO1 to the Camera Interface OCI1sw.

8   TECHNICAL DATA

Measuring range:	23 hours, 59 minutes, 59,999 seconds
Crystal frequency:	TCXO 10.000 MHz (Temperature compensated Crystal Oscillator)

Accuracy:

at changeable temperature:	+/- 2,5 ppm at -30 to + 75°C (+/- 0,009 sec/h)
Aging:	+/- 1 ppm per year
Frequency adjustment:	+/- 0,1 ppm at 25°C

|	
Operative timing range:	0 to 50°C
Memory:	minimum 4 MB RAM in the PC
	minimum 150 MB hard disk in the PC
Recording of the image:	on the hard disk of the PC
Storage of recorded pictures:	- floppy disk
	- Changeable hard disk
	- streamer
	- rewritten CD´s
Impulse input:	input resistance 10 k℧ against +5V
	impulse with less than 1 Volt (falling signal)
	hysteresis about 2 Volt
Output 5V DC stabilized:	total maximum of 120 mA
Speech amplifier:	communication through standard start cable
Operating elements:	keyboard
	mouse

Display board interface:

Transfer format: 1 start bit, 8 ASCII bit, no parity bit, 1 stop bit

Transfer speed: 2400 baud

Pin connection: The OPTI ODB1 has two identical sockets for the display
board (and Videogenerator).
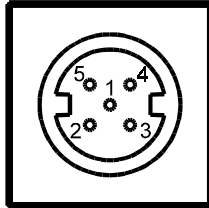
1   common ground
2   output supply (6 to 15 VDC)
3   output data channel
4   output supply (6 to 15 VDC)
5   output data channel

Data format:

The data format consists of 24 ASCII characters. The 24th character is always the carriage return. If
you have a running time it sends on the fourth character a point. If you have a run time (intermediate
time) it sends a blank as fourth character. Depending on the adjusted precision it sends 1/10, 1/100,
or 1/100.

```
         1          2
12345678901234567890 1234
   .     HH MM SS.z    (CR)
         HH MM SS.zht  (CR)
```

Amount of ASCII-characters
running time
run time

.   the fourth character is a point if you have a running time, the seventeenth
             character is a point to indicate where the seconds end.
HH   hours
MM   minutes
SS   seconds
z   1/10 seconds
h   1/100 seconds (depending on adjusted precision)
t   1/1000 seconds (depending on adjusted precision)
(CR)   the 24th character is always a carriage return

8.1. OPTI-Computer-Board OCB1sw:

The OCB1sw must be built into the PC. It needs a free ISA/AT slot (16 bit slot) in the PC.

8.2. Distribution Box ODB1sw:

The Distribution box ODB1sw has all external outlets:

Computer: Connection from the distribution box to the PC
Camera 1:   Connection form to the Camera 1 (Camera interface)
Head set: Connection for head set
Photocell / Power Supply: Connection for photocell and power supply (four connectors)
RS 232:   no function
Display Board: connection for display board

8.3. OPTI Line Scan Camera OLC1sw:

Camera type: CCD line scan camera
Pixel per line: 512
Lens: C-Mount

8.4. Cable:

PC - Distribution Box ODB1sw: cable 097-01 (1m)
Distribution Box ODB1sw - Camera Interface OCI1sw: cable 098-30 (30 m)
camera Interface OCI1sw - Camera OLC1sw: cable 099-01
Distribution Box OCI1sw - Photocell RLS1c or RLS3c: cable 001-30
Distribution Box OCI1sw - Speech amplifier SV3/SM: cable 000-05 (optional cable reel KT 300)

9. EXAMPLE OF PRINTED LISTS AND PICTURES

9.1. Start List:

The start list includes the following:

Headline of the List:
   The headline tells what kind of list it is and the name of the competition.

Race information:
   The race information includes the data about the race:
   discipline, competition number, race number, date, start time, and city of event

Start list:
   The start list includes the data about each competitor in a race:
   bib, lane, name and surname, age, and club

Bottom line:
   The bottom line shows the directory and file name of the race.

Responsible Referee:
   The responsible referee must check the list and sign it. This signature is always on the last page of the list.

9.2. Results List:

The results list includes the following:

Headline of the List:
   The headline tells what kind of list it is and the name of the competition.

Race information:
   The race information includes the data about the race:
   discipline, competition number, race number, date, start time, city of event, and wind speed.

Ranking list:
   The start list includes the data about each competitor in a race:
   rank, bib, lane, name and surname, age, club, and time

Bottom line:
   The bottom line shows the directory and file name of the race.

Responsible Referee:
   The responsible referee must check the list and sign it. This signature is always on the last page of the list.

9.3. Results List by Lane:

The results list by lane includes the following:

Headline of the List:
　　The headline tells what kind of list it is and the name of the competition.

Race information:
　　The race information includes the data about the race:
　　discipline, competition number, race number, date, start time, city of event, and wind speed.

Ranking list:
　　The start list includes the data about each competitor in a race:
　　lane, name and surname, age, club, bib, time, and rank

Bottom line:
　　The bottom line shows the directory and file name of the race.

Responsible Referee:
　　The responsible referee must check the list and sign it. This signature is always on the last page of the list.

9.4.   Times by Photocell:

You can print as well the times taken with the photocell. The photocell times are the times who control the recording and stop the time on the screen and display board. Next to the photocell time it shows the image number of image where the time is stored).

Headline of the List:
　　The headline tells what kind of list it is and the name of the competition.

Race information:
　　The race information includes the data about the race:
　　discipline, competition number, race number, date, start time, city of event, and wind speed.

Photocell time:
　　Each photocell time is printed with the image number.

Bottom line:
　　The bottom line shows the directory and file name of the race.

9.5. Image:

Image with Time:

It prints the image that it is shown on the screen. All times that you have transferred form the image to the competitor list are shown on the printout under the time line.

If you have a time jump in a picture, it shows a dashed black and white line.

Over the picture it shows a information line. There it prints the race information, as well as the file name of the race.

Image without Time:

It prints the picture that it shows on the screen. Below the graphic it prints a time scale.

If you have a time jump in a picture, it shows a dashed black and white line.

Over the picture it shows a information line. There it prints the race information, as well as the file name of the race.

Cropped Image with Time:

It prints the detail that you select (see page 30). The times that you have transferred to the competitor list from this detail are shown on the printout under the time line.

If you have a time jump in a picture, it shows a dashed black and white line.

Over the picture it shows a information line. There it prints the race information, as well as the file name of the race.
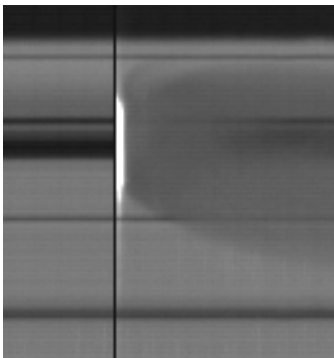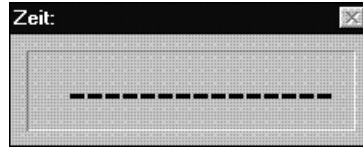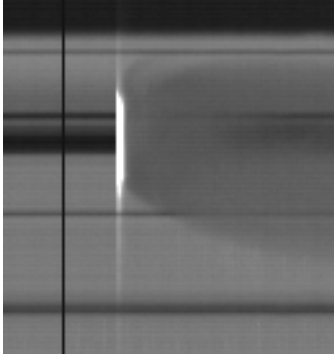
Cropped Image without Time:

It prints the detail that you select (see page 30). Below the graphic it prints a time scale.

If you have a time jump in a picture, it shows a dashed black and white line.

Over the picture it shows a information line. There it prints the race information, as well as the file name of the race.

Teststart:
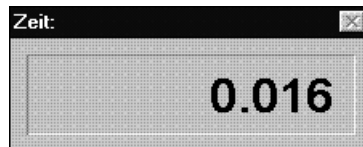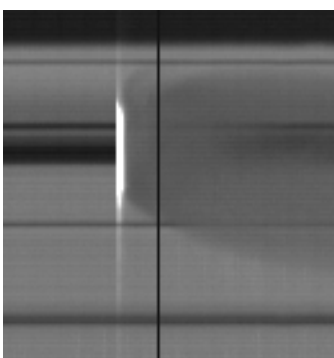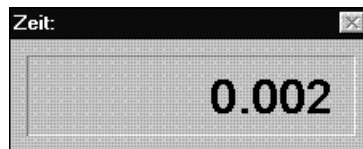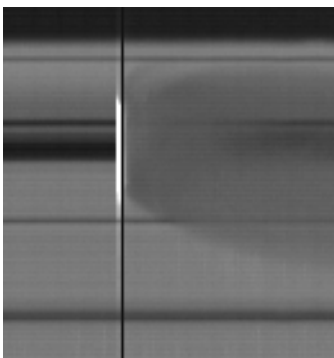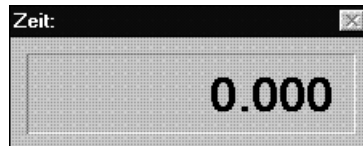
You can check the start of the OPTI1sw very easy. All you have to do is to go into the mode "TESTSTART" and shoot the gun on the finish lane. The recorded shoot (you can see the flame of the gun) must start exactly at 0.000 s. If this happens it guarantees a proper synchronization between startshoot and system start (time).

✔ adjust OPTI1sw for the event

✔ adjust camera correct on the finish lane

✔ Adjust contrast and brightness of the OPTI camera

✔ connect Strartmicrophne SM7 with the OPTI

✔ mount the Startmicrophone SM7 on the startgun

✔ set the startgun on the finish lane

✔ make the background of the startgun dark (maybe a dark paper)

✔ click on <Start options>

✔ click on <Test start>

✔ press key <F2>

✔ trigger startgun

✔ check the recorded picture

✔ the time must start to run with the flash of the shoot