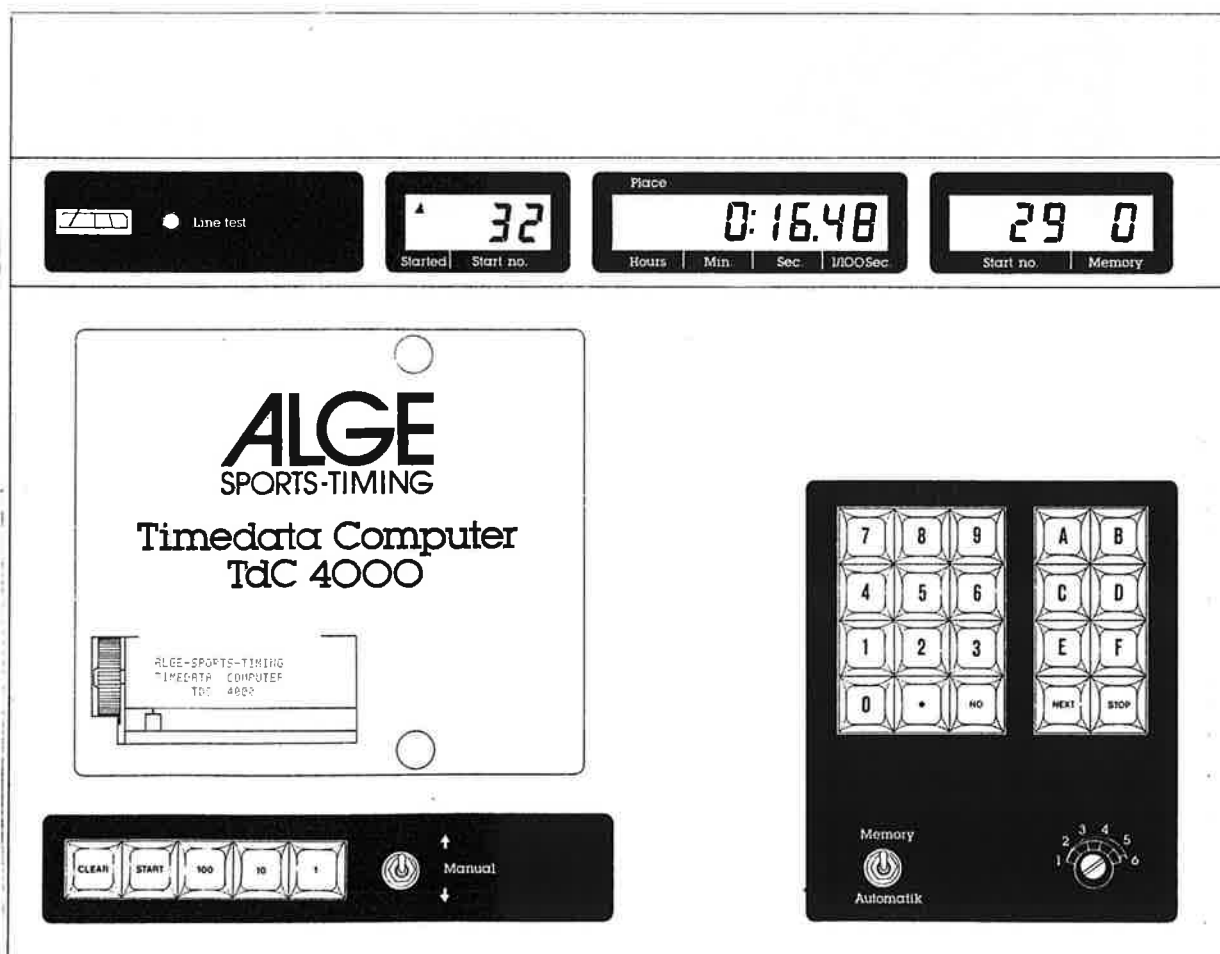


ALGE-SPORTS-TIMING

Timedata Computer TdC 4000

SPEED SKATING



- 1 ... Meter for monitoring power supply, photoelectric cell alignment and line status of the start-finish line.
- 2 ... Button for line test.
- 3 ... Cover release buttons for printer and battery compartment
- 4 ... No function in program speed skating
- 5 ... Display to show inside line startnumber
- 6 ... In the left corner (where it says place and hours) it shows the laps to go. At the right side it shows the time (inside- or outside track).
- 7 ... Display shows outside track startnumber.
- 8 ... Display shows which time it is in the in display (6). I = inside track; A = outside track
- 9 ... Keyboard with the following function keys:
 - A ... No function
 - B ... Key to adjust parameters (B-menu). You can adjust this parameters before you input "LAPS TO GO".
 - C ... Clears the last time of inside track.
 - D ... Clears the last time of outside track.
 - E ... No function
 - F ... No function

NEXT Switches the running time (display 6) between inside and outside track.

STOP Internal stop key for outside track.
- 10 ... Step switch for setting the delay time for stop with six levels
 - 1 ... 1 msec.
 - 2 ... 30 msec.
 - 3 ... 120 msec.
 - 4 ... 400 msec.
 - 5 ... 1 sec.
 - 6 ... 2 sec.
- 11 ... Automatic - Memory change-over switch:

If you switch on memory before you input the startnumber you can show the stored times in display (6).

- 12 ... Keyboard with the numbers 0 to 9 for the input of laps and startnumbers.
Confirm key
NO key
- 13 ... Metallic-paper printer furnishes all data and results required for the race.
- 14 ... No function
- 15 ... No function
- 16 ... Manual startkey
- 17 ... Key to erase the start.
If you press "CLEAR" after the competitors finished, you can input the next startnumber.
If you press two times "CLEAR" it is possible to input the "LAPS TO GO" or change parameters (menu B).
- 18 ... Power switch for tuning the TdC 4000 on or off.
- 19 ... Four completely identical DIN jacks in parallel, for connecting an external power supply (battery or charger) and photocells RLS1 for the finish times.
- 20 ... Banana plug connection for a start device with normally open contact.
- 21 ... Banana plug connection for stop impulses of the outside track with normally open contact.
- 22 ... Two completely identical serial data outputs with V24 interface (4800 baud asynchronous) for connecting an ALGE GAZ display board for example. If the display board does not work turn the plug 180 degrees.
- 23 ... Connection for audio set (headphone Q34)
- 24 ... On - Off switch for the printer (in case the paper runs out during operation or paper jams).
- 25 ... Parallel centronics output (see technical data)

STARTING UP THE Tdc4000

The instructions for starting up the Tdc4000 given below are to be carried out sequentially. The operation during or after termination of a race is explained in detail in the descriptions for the individual competitions.

POWER SUPPLY

Your Tdc4000 is delivered with an installed set (6 pcs. D size 4 Ah) Nicd batteries and a 110V charger. The batteries are accessible through the printer cover by pressing down the two buttons.

If an AC outlet is available the timer's batteries can be continuously charged during operation. If no AC outlet is present a full charge will provide approx. 10 hrs. of operation even in severe weather.

The charger is connected to one of the Tdc's recepticals (18) marked ext. power / light beam. Charge for approx. 14 hrs.

Please note! Nickel cadmium batteries tend to memorize the duration of the previous discharge periods e.g. if the timer is used every day for 2-3 hrs. it may occur that the 10 hrs. of operation will not be provided if needed. This may be remedied by letting the batteries completely discharge occasionally and then charging them for 14 hrs.

Further supplied is a battery cable with battery clamps. This cable is used with a 12V auto battery in case no AC outlet is available and the internal batteries are discharged.

To check the voltage supply of the mentioned sources, observe the needle in the level meter (1) as the timer is turned on and printer is in operation. If the needle stays in the green field, the supply is OK.

EXTERNAL CONNECTIONS

START IMPULSE: The timer can be started via a 2 lead wire connected to either the two green banana jacks (20) or to one of the four 5 pin DIN recepticals (19) pin 1 and 3. Pin 3 being ground.

The following triggering devices can be used:

ALGE Start Gate STS3 - STS3/II,

ALGE Infrared Photocell RLS1/E,

ALGE Start Transducer (adapter for pistols).

Please note: Start gate STS3 and STS3/II incorporate a speech amplifier and connection for a K158 headset which allows perfect communication via the single pair start to finish cable.

INTERMEDIATE IMPULSE: The timer receives an intermediate impulse via a two lead wire connected either to the two red banana jacks (21) or to one of the 4 DIN recepticals (19) pin 6 and pin 3.

The impulses received through these two recepticals result in different functions in some programs. Consult the example selection chart.

Triggering devices to be used are:

ALGE infrared photocell RLS1/E direct or externally powered or any mechanical device with normally open contact.

FINISH IMPULSE: The timer receives a stop impulse via a two or three lead wire connected to one of the 4 DIN recepticals (19) pin 2 + 3 or pin 2 + 3 + 5 respectively.

Please note: Connection made via a three lead wire to the RLS1/E photocell will carry the trigger signal pin 2 + 3 as well as supply +5 V (pin 5) to photocell. (Max. 150-200 ft.)

OTHER CONNECTIONS: Telephone headset K158 connected to DIN Jack (23) allows communication via a two lead cable connected to start input (20) and start gate STS3.

ALGE Display Board GAZ connected to data out (22) will provide identical information as on liquid crystal readout (6).

Data out 1 (25) centronics output provides identical information as on paper printout.

LINE TEST (START-FINISH LINE)

The "line test" button (2) is pressed to check the electrical connection between the start and the finish. Connect the start to finish cable to timer only (20) press line test button to check if the needle of the meter stays in the green area. If not, there is either too high a resistance or a short in the cable. If the needle stays in the green connect starting gate in closed position and repeat test procedure. Needle should stay in the green as long as the gate is closed. Open gate, needle must now deflect into gray area (as long as line test button is depressed).

PAPER ROLL - CHECKING AND EXCHANGE

Push the two cover release buttons (3), remove the cover and check the supply of paper. When the roll is about to run out, a black stripe on the side of the paper appears.

Proceed as follows when replacing the roll of metallized paper:

- Lift out used roll and tear off paper before it goes into the printer.
- Carefully roll out remaining paper with the white paper guide wheel.
- Insert new roll with the shiny side down.
- Carefully turn the paper guide wheel towards the rear until the stripe of paper comes out over the tear-off blade.
- Replace cover.

Caution! Do not pull on paper while printer is in operation. Always use paper advance wheel to advance paper.

Should the printer run out of paper during timing or should it jam, turn off the printer with the "printer on" switch (24). This allows you to continue timing since all times are stored. In the meantime a new roll can be inserted. The printer must also be switched off immediately if the paper jams for any reason. To remove any jammed paper, the printer's black lever with the arrow must be pressed completely forward in the direction of the arrow while carefully pulling out the paper at the same time.

SETTING THE DELAY TIME

This refers to the time in which the photoelectric cell no longer emits pulses after an interruption. This time is set with the six-level turn switch (10). The delay can be heard from the peep tone in the device when there is an interruption with the photoelectric cell connected to the finish input.

For alpine skiing, the delay time is set the longest because one racer does not immediately follow the other. This is different in cross-country skiing for example, where it is best to determine the ideal delay time through experimentation. A too long delay time could "swallow up" a second racer coming right behind. A too short delay time can be the cause of multiple triggerings. The following delay times are available: 1=1/1000, 2=30/1000, 3=120/1000, 4=400/1000, 5=1sec, 6=2sec.

* TdC 4000 - SPEED SKATING PAGE 1 *
* * * * *

SYSTEM DISCRIPTION:

=====

- max. distance 10,000 meters
- max. 25 laps a' 400 meters
- max 49 pairs of skaters (98 competitors)
- max. lap-time is 65 seconds (lap-time starts after 65 seconds again form zero)
- timing with 1/100 or 1/1000 seconds possible
- 4 to 6 GAZc are necessary: 2 for bib and lap, 2 for run-times, 2 for lap-times (all with special software)
- the TdC 4000 prints intermediate time, lap time and calculated finishtime (lap time and calculated finish time can be turned on or off)
- All times are automatically stored in the TdC 4000

```

*****
*   TdC 4000 - SPEED SKATING                      PAGE 2   *
*                                                                 *
*****

```

MEMORY:
=====

All times are automatically stored. If you turn the TdC 4000 on it asks you, if you want to clear the memory.

Clear the memory with key .

Memory stays with key NO

ADJUST PARAMETERS (MENUE B):
=====

If you press key "B" after the TdC prints "LAPS TO GO", it is possible to adjust some parameter for your special needs.

You can change parameters till you press the key "NO".

THOUSENDTH ON	(1) = 1/1000 sec. on
THOUSENDTH OFF	(2) = 1/1000 sec. off
TCXO..11.520MHZ	(3) = type of quartz
QUARTZ..9.216MHZ	(4) = type of quartz
CALC. FT PRINT ON	(5) = calulation of finishtime on
CALC. FT PRINT OFF	(6) = calulation of finishtime off
SEQU. - TIME ON	(7) = sequential time on
SEQU. - TIME OFF	(8) = sequential time off
TESTPROGRAM	(9) = internal testprogram
EXIT	(NO) = return into the program

LAPS TO GO:
=====

Before every race you have to input the "LAPS TO GO" (max. of 25 laps = 10,000 meters). The first stopimpuls for each track does not count the laps down (except for the 10,000 meters run), because they did not run a complete lap. The laps to go are shown in the display (6) at the hour position.

If the lap counter shows 00 it means the competitor reached the finish.

The "LAPS TO GO" have to be confirmed with key .

If you want to change the "LAPS TO GO" during the race press two times "CLEAR".

* TdC 4000 - SPEED SKATING PAGE 3 *
* *

INPUT THE STARTNUMBER:
=====

You can use startnumbers from 1 to 99. The maximum is 48 runs (98 competitors) for the memory.

Before each start you have to input the startnumber of both competitors. First you input the number of the inside runner (green display 5) then of the outside runner (red display 7).

Each startnumber must be confirmed with .

If you have a single runner at the start, confirm the empty track with .

If you want to change a startnumber, press key "CLEAR" and input the correct number.

TdC 4000 IS READY:
=====

The TdC 4000 is ready for the start. The max. lapttime is 65 seconds.

SWITCH DISPLAY:
=====

The Display (6) shows only the time of one track. With the key "NEXT" it is possible to switch the display between inside- and outside track. Display (8) shows, which time is shown.

I = inside track
A = outside track

FALSE START:
=====

A false start can be cleared with the key "CLEAR" (17).

FALSE PHOTOCCELL IMPULSES:

=====

If you get a wrong photocell impulse (e.g. from a coach) you can clear it with key "C" (inside track) or "D" (outside track).

LINE CHANGE:

=====

Since the competitors change the track each lap, you need a "LINE CHANGE LC1".

The LINE CHANGE has two switches, one for each competitor. Two LED shows the positions of each switches (inside or outside).

FINISH TIMES SHOWN ON THE DISPLAY:

=====

Any finish time can be shown in the display, if no competitor on the track (after it prints "STARTNUMBERS INPUT").

In order to show the stored finish times, you have to switch the toggle-switch (11) to position memory and input the startnumber. Every startnumber must be confirmed with .

PRINTER:

=====

The printer prints:

- startnumber (two digits)
- laps to go
- sequential time (lap time)
- finish time
- calculated finish time

DISPLAY BOARDS:
=====

For each track you need two display boards. One four-digit display (startnumber and laps) and one six-digit display (time).

The display board for time shows intermediate times for five seconds and lap times for four seconds (if turned on in menu B). When the competitor reaches the finish, it shows five seconds the finish time, four seconds the lap time and again the finish time till you input a new startnumber.

If the display board does not work after you plugged it, turn the plug on the backside of the TdC 4000 (22 or 23) 180 degrees.

=====
T I M I N G
=====

- Turn TdC 4000 with switch (18) on
- Clear memory with key
- Input "LAPS TO GO" or press key "B" (menue B) and input parameters
- Confirm "LAPS TO GO" with key
- Input startnumbers (first inside track, press , then outside track, press); the startnumber of the inside track is shown in display (5), the outside track is shown in display (7).
- Timer is ready for the start
- A false start can be cleared with key "CLEAR"
- With key "NEXT" you can switch between the time of the inside and outside track. Display (8) shows which time it shows (I = inside, A = outside) in display (6)
- Display (6) shows: laps to go, runing time, intermediate time, and lap time.
- When a competitor reaches the finish, it shows in display (6) 00 laps.
- If you get a wrong impuls from the photocell you can clear it with key "C" (inside track) or "D" (outside track)
- Before you are able to input the startnumbers for the next run, you have to press key "CLEAR"

6. TECHNICAL DATA

=====

Timing range: 23 hours, 59 minutes, 59.999 seconds

Accuracy: +/- 0.000003 sec by -20 to +60 degree celsius

Quartz frequency: 9.216 MHz

Operative temp. range: -25 to +50 degree Celsius

Memory: max. 950 start and finish times

Operating elements: 25 keys
1 turn switch
2 toggle switches
2 on-off switches
1 test button

Inputs: 1 input each for start, stop, and intermediate time (active low), 6 pin DIN jack 45322 (19) with following pin assignment: 1=start, 2=stop, 3=ground, 4=extern supply, 5=+5V stabilized for ALGE Photocell, 6=intermediate time.
Banana jacks (20) for start (green) and intermediate time (21, red). Max. cable resistance 2000 Ohm, switch point approx. 1.2 Volt. Input for extern supply (9 to 16 V), 6 pin DIN jack 45322.

Outputs: 6 pin DIN jack, 5 V stabilized for ALGE Photocell RLS1.
Two outputs (22) for ALGE display board GAZ, V24, 5 pin DIN jack 45327 with following pin assignment: 1 = ground, 2+4 = 9 to 16 V DC output, 3 = channel 1 (running time), 5 = channel 2 (final time).
Parallel output (centronic) D-subminiature plug (25) 15 pin.
Connection for headset, 5 pin DIN jack 41524 with following pin assignment: 1 = microphone, 2 = ground, 3 = audio frequency output (impedance greater than 25 ohm)

Power supply: Internal, 6 times UM - Alkali (buffer battery) or 6 times Ni-Cad 4 Ah batteries. (switching to charge resistance possible)
External 9 to 16 Volt, min 4Ah or ALGE 110 V charger.

Power consumption: Without printer at about 300 mA, through printing at about 800 mA.

=====

T E C H N I C A L D A T A S

=====

OUTPUT OF SEIAL CANAL 1:
 =====

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
BL	NZ	NE	LZ	LE	MZ	ME	SZ	SE	z	h	SZ	SE	z	h	MZ	ME	SZ	SE	RZ	RE
					RUNTIME					LAPTIME					CALCULATED FINISH TIME					

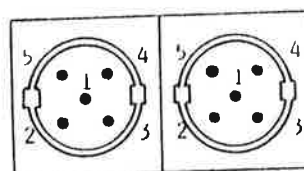
22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
BL	NZ	NE	LZ	LE	MZ	ME	SZ	SE	z	h	SZ	SE	z	h	MZ	ME	SZ	SE	RZ	RE	OD
					RUNTIME					LAPTIME					CALCULATED FINISH TIME						

Character 1 to 21 are datas for the inside competitor,
 character 22 to 42 are datas of the outside competitor.

- BL ... blank
- NZ ... startnumber ten
- NS ... startnumber one
- LZ ... laps ten
- LE ... laps one
- MZ ... minutes ten
- ME ... minutes one
- SZ ... seconds ten
- SE ... seconds one
- z ... tenth second
- h ... hundredth second
- RZ ... rank ten
- RE ... rank one
- OD ... carriage return

PIN CONNECTIONS OF 'DATA OUT 2':

- 1 GROUND
- 2 +9 to 15 Volt
- 3 serial OUTPUT 1
- 4 +9 to 15 Volt
- 5 serial OUTPUT 2



The serial DATA OUTPUTS and the serial DATA INPUT are also on
 the socket of the parallel interface.

GAZ 82 ADJUSTION FOR SPEED SKATING:



SWITCH1 SWITCH2

SWITCH 1:

- ← TIME
- STARTNUMBER - LAP

SWITCH 2:

- ← INSIDE TRACK
- OUTSIDE TRACK

IF SWITCH 1 IS ON TIME:

Thumbwheelswitch on position

- 1 --- RUNTIME
- 2 --- LAP TIME
- 3 --- CALCULATED FINISHTIME

