Instruction manual for the training computer with digital display

ST2510-8 / ST2550-8, -9 / ST2551-8

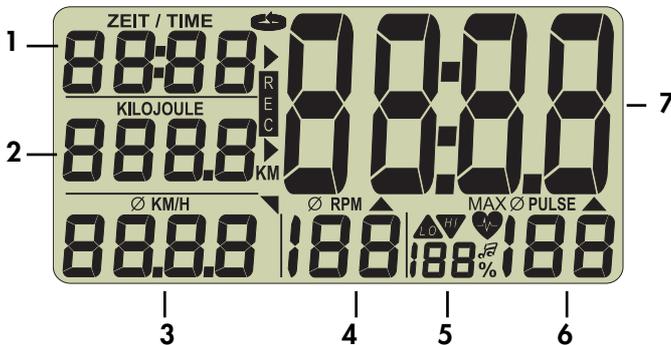## Symbols in the display
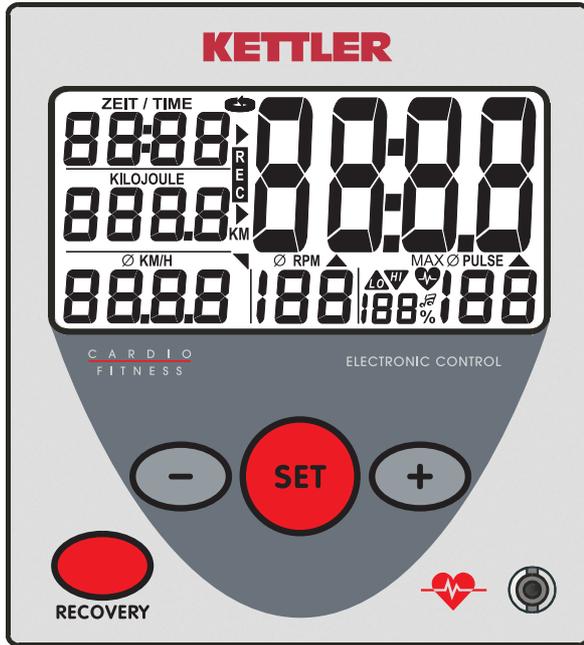
Equipment:

Values:

|		
1	Time	0:00 - 99:59 [min:sec]
2	Energy consumption	0 - 9999 Full kilometers (Odometer) [0 - 9999 km]
3	Speed Distance	0 - 99.9 [KM/H] 0 - 99,9 [KM]
4	Pedal frequency	20 - 199 [Revolutions/min] Pedal revolutions
5	Percent	Relationship: Current pulse – maximum pulse
6	Pulse	50 - 199 [Beats/min]
7	Large display	Room temperature [0 - 40 °] Fitness grade [F1.0 - F6.0]

Symbols:

a	REC	Recovery pulse
b	SCAN	Automatic display change
c	Arrow	current area in the large display
d	KM	Full kilometers
e	Average	Beat frequency + pulse
f	LO	Lower than the lower pulse value
g	HI	Higher than the higher pulse value
h	Heart	blinks in tact with the pulse
i	Percent	% of maximum pulse specification
j	Grade	acoustic maximum pulse supervision
k	MAX	Exceeding the maximum pulse

Keys:

Minus key	Lower value (display range back)
Set key	Function key [Specification, Change, Reset of the display]
Plus key	Increase values (display range up)
Recovery key	Function key [Fitness grade determination]

Attachment (front)
Connector — for the ear clip

Attachment (back)
Connector (4 pole) — for the hand pulse sensors (**not with Racer and Crossbike**)
Connector (2 pole) — for the speed recorded
Battery compartment — 2 batteries: Mignon1.5 Volt, LR6, AA,
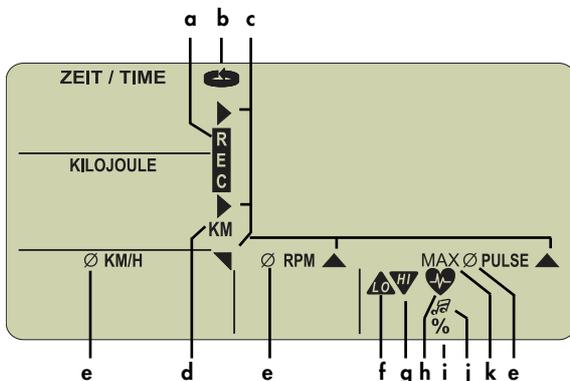
1.0 Display before exercising

1. **Room temperature** — Picture 1 [before and after exercising]
2. **Full display** — Picture 2 [after **pedalling** or **pushing button**, 1 sec]
3. **Full kilometer** — Picture 3 [Length of display: 10 seconds or key]
4. **Start display** — Picture 4

Picture 1 room temperature

Picture 2 full display

Picture 3 full kilometer

Picture 4 start display

2.0 Recording of pulse

This display offers two or three ways of recording the pulse:

1. with the hand pulse sensors **(not with Racer and Crossbike)**

2. with the ear clip

3. with a chest belt (as accessory available in shops)

Recording pulse with the hand pulse sensors

The hands cover the hand pulse sensors

Recording pulse with the ear clip

Plug the ear clip in the connection

Rub an earlobe to improve the circulation

Put the ear clip on the earlobe

Recording pulse with the chest belt

Put on the chest belt. Take notice of the corresponding instructions.

Pulse display

You have adjusted the start display (Picture 4).

The heart symbol (h) blinks in tact with your pulse.

After a few seconds, the pulse is shown as a value (6).

3.0 Exercising without specification of exercise data

Start exercising. All values are counted **upward**.

4.0 Exercising with specification of exercise data

Setting time (1), **Kilojoule** (2), **Distance** (3) and **Pulse** (6).

You have set the start display (Picture 4). Press the set key, enter the **set-**ting mode and set the desired values with the **+** or **– keys**.

If you press the **+/– key longer**, a **quick advance or return** of the setting values will follow.

If you press the **+/– keys together**, the value will go back to „**OFF**".

With the **set** key, you will reach the **next settings**.

After the pulse setting, leave the setting mode with the **set** key and see the display with the possible settings (Picture 16/17).

Press the set key longer and the display will go to the **full display (reset function)** (Picture 2).
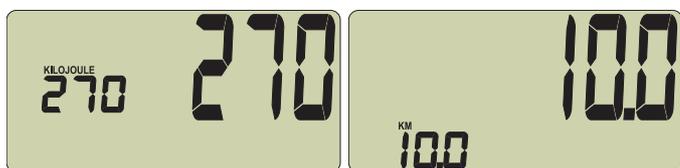
Note

If you do not enter a setting value within 4 minutes, the display will go to room temperature (Picture 1).

Picture 5

Picture 6

Picture 7

Picture 8

Picture 5: The time setting begins with "OFF"

Picture 6: Time setting: e.g. 18 minutes

Picture 7: Energy consumption setting: e.g. 270 Kilojoule

Picture 8: Distance setting: e.g. 10 KM

The right exercising pulse

The exercising pulse depends on age and exercise goal. For each age and exercise goal there is the "right" so-called aerobe exercise area which is designated by an upper and lower pulse limit (+/- 10 beats). The exercise pulse should always be within the aerobe zone. The maximum pulse frequency (220 minus age) may not be exceeded. Healthy people orient themselves on the following diagram (compare also 4.2).
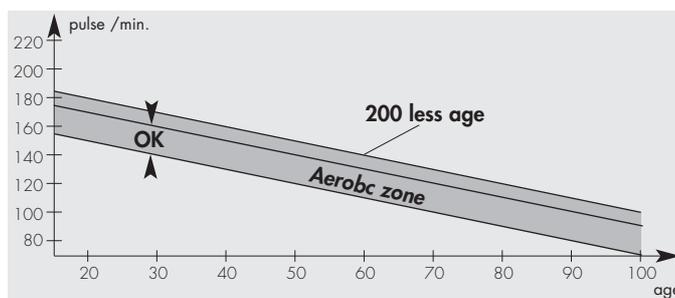
Pulse setting possibilities

The scheme shows the course of the pulse settings
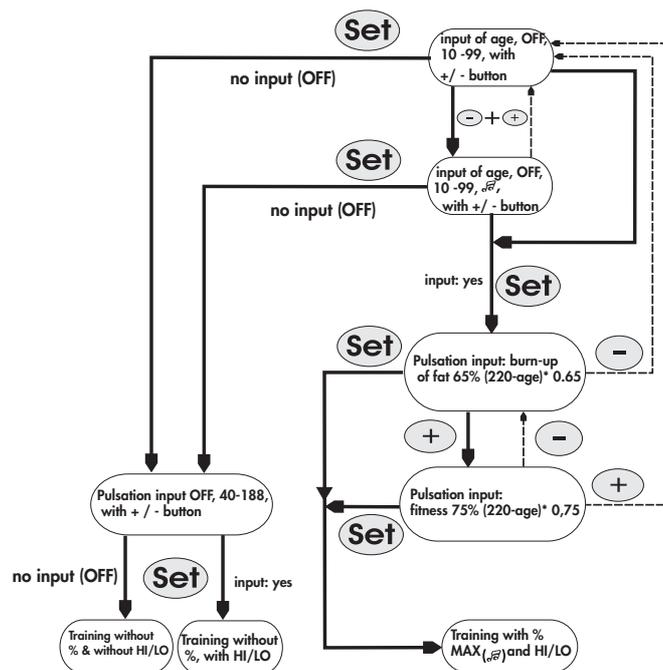
In detail:

Setting – exercise pulse

With the **set key**, you have access to successively **2 setting areas**:

1. Age   (Picture 9/10)
2. Pulse zones : burning of fat   [Fa 65%]   (Picture   12)
                Fitness   [Fi 75%]   (Picture 13)

4.1 Age setting / alarm signal ON/OFF

The age setting serves for the calculation of your maximum pulse.
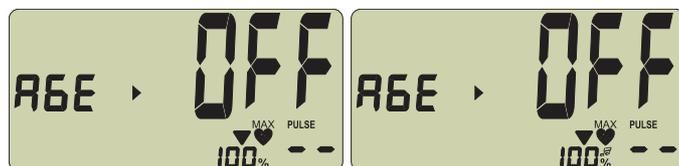
Picture 9

Picture 10

No setting "OFF". Shutting on of the alarm signal: press **+/–** keys together.

No setting "**OFF**" with "grade". When you exceed the maximum pulse, an alarm signal will ring.

When you enter your age, in the PULSE display (**6**) there will be a maximum pulse which depends o the age **(Formula: 220 – age)** (Picture 11). With settings up to 21 years, only 199 can be displayed as maximum pulse but the right value will be calculated.

Picture 11

Age setting e.g. 31 with maximum pulse display 189

4.2 Pulse zones

with the **+/– keys** you select **2 zones**. The age setting serves for the calculation of these pulse zones. This is visible with the % display (5).

1. Burning of fat [Fa 65%] (Picture 12)
Formula: (220 - age) x 0.65

2. Fitness Zone [Fi 75%] (Picture 13)
Formula: (220 - age) x 0.75

Picture 12

Pulse zone: burning of fat with 65%

Picture 13

Pulse zone: Fitness with 75%

Function

Through the setting of the pulse zones and the assumed maximum pulse, a pulse zone supervision is activated. If the **set exercise pulse falls short of 11** beats, the display shows "**LO**", if **11** beats are exceeded „**HI**". The "**LO**" supervision is active if first the given exercise pulse is reached **while pedaling**. If the rotation number falls below **20**, the "**LO**" function becomes **active** again when the given exercise pulse has been reached. The "**HI**" supervision is **always** active.

If the **maximum pulse** is exceeded by **1** beat, "**HI**" will blink and "**MAX**" appears. If the **acoustic alarm** is active, you will be able to hear the **alarm signal.** The value which is displayed with the % symbol is the comparison between current pulse value and maximum pulse value.
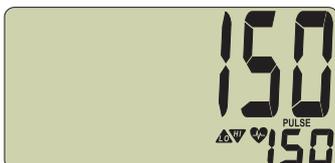
4.3 Pulse supervision (depending on age)

This setting is possible in the area from 40 – 188 with the +/- keys.
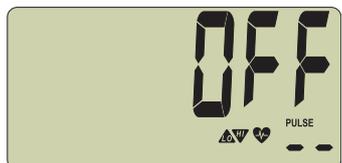
Picture 14
No setting "OFF"

Picture 15
Pulse value setting e.g. 150 with **HI LO** symbol

Function

The "HI" and "LO" display functions as described in 4.2.

The proportional pulse display as well as the acoustic alarm function are not available.

4.4 Finishing the settings

After the last setting, if you press the set key, your setting values (except for pulse setting) will be displayed (Picture 16).

If you have activated a pulse zone, under (5) the comparison between the current pulse value and the maximum pulse value or "– –" (Picture 17) with missing pulse signal will be shown.

Picture 16

Picture 17
Pulse zone setting (compare Picture 12/13)

Function

Start pedaling. All **setting values** count **backwards**, blink at zero for a cou-

ple of seconds and then count from the setting value upwards. In addition, short signal tones are emitted.

If your **pulse beat** exceeds the entered **pulse limit** or your **maximum pulse exceeds** it, first the HI and then the MAX symbol will be displayed.

5.0 Display while exercising

When you start exercising, in 5 second tact an automatic display change **SCAN** will begin (symbol **b** in the display). With the set key, you can shut it off. With the +/– keys you can then jump forward or back a display area.

6.0 Display before exercising, with breaks in the exercising, end

If you make less than 20 pedal rotations/min, the electronics recognize a break in the exercising. An automatic display changestops. The **SCAN** symbol disappears. Below KM/H (**3**), RPM (**4**) and pulse (**5**) the average symbol (**e**) and the average value is displayed.

If you do not continue exercising within 4 minutes, the display changes to **room temperature** (Picture 1). In doing so, the **distance** is added in full kilometers. All **other** values **are not stored**.

Note

Speed (3) and distance (3) change in 5 second tact.

With the +/- keys, you can jump forward or back one display area.

With the set key, you return to the setting mode. In doing so, all previous exercise data will be deleted. Settings remain.

7.0 Display when continuing exercising

Start exercising again. The values continue to count.

8.0 Measuring recovery pulse

The exercise computer is equipped with a recovery pulse function. This makes it possible to measure your recovery pulse when you finish exercising.

When you finish exercising, press the recovery key. The current pulse value is taken over under **Time** (1) (Picture 18). The computer measures your pulse during a 59 seconds countdown(Picture 18). Afterwards, the current pulse value is taken over under **Kilojoule** (2) and under **KM/H** (3) the difference of the pulse values within the return are given and a fitness grade is displayed with (F) (Picture 19). The calculation is explained under 9.0 General. If the measurement of the pulse is interrupted, instead of a value (P) is displayed. If you press the recovery key, the current exercise display will appear again.

The current pulse is always shown under **Pulse** (6).

Picture 18
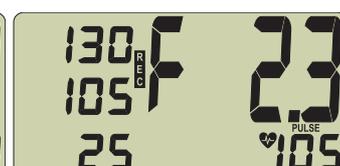
Picture 19

Picture 20
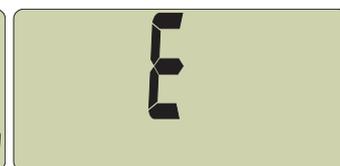
Picture 21

Picture 18: Measurement of the recovery pulse with time return (0:59 - 0:00)

Picture 19: Fitness grade display

Picture 20: No recognition of pulse (E) with recovery pulse measurement

Picture 21: No recovery pulse function (E)

Note:

If no pulse value is displayed, the recovery pulse function is not activated.

9.0 General

Calculation of speed

With **exercise machine, Racer, Crossbike:**

60 pedal rotations result in a speed of 21.3 km/h.

With Cross Trainers:

60 pedal rotations result in a speed of 9.5 km/h.

Calculation of kilojoules

The calculation is based on the medium load level and only changes through variation of the pedal frequency.

From a sport medicine point, with **bicycling** there is the following energy consumption: 1 hour **bicycling** at 24 km/h uses 1680 kJ – 1 kilometer results in 70 kilojoules.

Cross Training the following energy consumption: 1 hour **cross training** at 9.5 km/h uses 3344 kJ – 1 kilometer results in 352 kilojoules.

Fitness grade calculation

The computer calculates and assesses the difference between load pulse and recovery pulse and your resulting "fitness grade" according to the following formula:

$$\text{Mark (F)} = 6 - \left[\frac{10 \times (P1-P2)}{P1} \right]^2$$

P1 = load pulse P2 = recovery pulse
Grade 1 = very good Grade 6 = insufficient

The comparison of load and recovery pulse is a simple and quick possibility to check your body fitness. The fitness grade is an orientation value for your recovery ability after a physical load. Before you press the recovery pulse key and determine your fitness grade, you should exercise in your load area for a longer period of time, that is at least 10 minutes. With regular cardiovascular exercising, you will determine that your "fitness grade" will improve.

Average value calculation

For the calculation of the average value of speed, pedal rotations and pulse, all exercising intervals are taken into consideration until the "reset" function is activated or the "temperature" display appears.

Notes for measuring the pulse

The pulse calculation begins if the heart in the display blinks with the tact of your pulse.

With hand pulse (not with Racer and Crossbike)

After pressing the recovery key, quickly clasp again the hand pulse sensors or else the measuring of the pulse will be interrupted.

Avoid disturbing impulses.

A low voltage caused by the contraction of the heart will be registered through the hand sensors and evaluated by the electronics.

- Always clasp the contact surfaces with both hands.
- Avoid jerky clasping.
- Hold your hands quietly and avoid contractions and rubbing of the contact surfaces.

With ear clip

The pulse sensor works with infrared light and measures the changes of the transparency of your skin which are caused by your pulse. Before you put the pulse sensors on your earlobe, rub it strongly 10 times to increase the circulation.

Avoid disturbing impulses.

- Carefully attach the ear clip to your earlobe and look for a good point for the measurement (the heart symbol blinks without interruption).
- Do not exercise directly with strong lights (e.g. neon light, halogen light, spots, sunlight).
- Avoid in any case shaking or instability of the ear sensor including the cable. Using a clamp, always attach the cable to your clothing or even better to a headband.

With chest belt

Read the corresponding instructions.

Disturbances in the pulse display

Check the battery voltage of the electronics and the chest belt.

Disturbances with the exercise computer

Note the kilometer status. With unusual behavior with the exercise computer, take out the batteries, check the battery voltage and reinsert the batteries. **The stored full kilometers are lost when the batteries are changed.**

10. Exercise instructions

For your own safety

- Before beginning exercising, check with your doctor to make sure that you are healthy enough to exercise with this device. The medical finding should be the basis for the design of your exercise program. The wrong or excessive exercising can damage your health.

This exercise machine was developed especially for the leisure athlete. It is excellent for cardiovascular exercises.

The exercising is to be designed methodically according to the principles of endurance exercises. In particular changes and adjustments in the cardiovascular system are generated. This includes sinking the relaxation pulse and the load pulse.

Thus for the heart there is more time for filling the heart chambers and the circulation of the heart muscle (through heart coronary arteries). Furthermore, the intensity of breathing and the amount of air which can be inhaled (vital capacity) increases. Further positive changes take place in the metabolic system. In order to reach these positive changes, you have to plan exercising according to certain guidelines.

On the intensity of exercise

The intensity with exercising with the exercise machine is regulated on one hand through the pedal frequency and on the other hand through the pedaling resistance. The pedaling resistance determines the end of exercising with the brake force adjustment on the steering column. You should always make sure that you don't overstrain yourself and avoid overloading yourself in view of the intensity. The wrong or excessive exercising can lead to health damages.

Therefore control while exercising based on your pulse frequency if you have determined your exercise intensity correctly. A basic rule for the suitable pulse frequency is:

180 minus age

This means that e.g. a 50 year old person should determine their endurance exercises with a pulse frequency of 130.

Exercise recommendations based on this calculation is considered to be reasonable by numerous accredited sport physicians. Therefore you should set the pedal frequency and the pedal resistance when exercising in such a way that you reach your optimal pulse frequency according to the above named rule.

These recommendations are not only valid for healthy persons and are not valid for people with cardiovascular diseases!

On the load amount

The beginner only gradually increases the load amount of his exercises. The first exercise units should be relatively short and in intervals.

On the part of sport medicine, the following load factors are observed as fitness positive:

Frequency	Duration	
daily	10 min	
2-3 times weekly	20-30	min
1-2 times weekly	30-60	min

Beginners should not begin with an exercise unit of 30 – 60 minutes.

The beginner exercises can be conceived in the following manner in the first 4 weeks:

Training frequency	Extent of training session
1st week	
3 times a week	2 minutes of training Break of 1 minute for physical exercises 2 minutes of training Break of 1 minute for physical exercises 2 minutes of training
2nd week	
3 times a week	3 minutes of training Break of 1 minute for physical exercises 3 minutes of training Break of 1 minute for physical exercises 2 minutes of training
3rd week	
3 times a week	4 minutes of training Break of 1 minute for physical exercises 4 minutes of training Break of 1 minute for physical exercises 3 minutes of training
4th week	
3 times a week	5 minutes of training Break of 1 minute for physical exercises 4 minutes of training Break of 1 minute for physical exercises 4 minutes of training

For personally documenting your exercises, you can enter the reached exercise values in the performance table.

Before and after each exercise unit, 5 minutes of gymnastics can serve for warming up or cooling down. Between two exercise units there should be an exercise free day if you prefer exercising 3 times a week for 20 – 30 minutes. Otherwise there is no reason to not exercise daily.

Motion sequence (Cross Training)

The motion sequence of Cross Training is already determined through the elliptical rotation of the pedal surfaces and the suspension of the grip bar. Still some points should be observed:

■ Always make sure the construction and state of the device is correct before exercising.

■ When getting on the device, one pedal surface must be in the lower, on in the upper position. Grab the grip bar with both hands and first step on the lower pedal surface. When getting off, first get off the upper pedal surface.

■ Adjust the pedal surfaces on the optimal distance to the grip bar for you; make sure in doing so that there is enough freedom of the legs to the grip bar.

■ Exercise with the corresponding sports shoe and pay attention to the safe condition of the pedal surfaces.

■ Do not exercise without holding on. Hold the grips between the movable grip bars if you only want to exercise your lower body.

■ Make sure that you have an equal, round movement.

■ While exercising, vary between forward and backward movements of the pedal surfaces in order to stress the leg and bottom muscles in different ways.

With regular exercising, you can increase your endurance, your energy and thus your well being. The success of the exercises is optimized by a health-conscious lifestyle which is determined by a balanced, adequate diet.

date	resistance level	distance (km)	time (min)	P1	P2	fitness-note