Thank you very much for choosing the MICROSPORT In-Line Skate Speedometer. This speedometer is easy to install and has an outstanding accuracy.

Before you start using your speedometer please read this operating manual carefully. The actual installation procedure will not take you longer than 10 minutes.

ATTENTION:

1. MICROSPORT's In-Line Skate Speedometer uses some small components which can be swallowed and can cause death by suffocation.
2. Always check the your equipment before skating. Check the bearings and the fitting of the axle to avoid blocking or loosening of a wheel.
3. Skating accidents can always happen, even to experienced skaters. To avoid serious damage always wear the complete protective gear.
4. Skating needs the full attention of the skater, so don't let the MICROSPORT In-Line Skate Speedometer disturb you from the traffic around you.

A. A watchlike **Display**
B. An orange **Wheel** with an included **magnet**
C. A **puck**, housing the skate **computer**. The puck is approximately 1 cm high and has a 5 cm diameter
D. Two kinds of **spacers, one cylindrical the other one looks like a thick ring.**
E. One **distance ring**
F. Two **outer spacers** to fit the MICROSPORT-Wheel in wider frames.

The different components of your speedometer are shown in picture 1.

2. Installation

2.1. Installation of the MICROSPORT Wheel

First you have to replace one of your current wheels with the MICROSPORT-Wheel. In principal it does not matter which wheel of your skates you replace, but we recommend to chose the second or the third wheel. This guarantees the best protection of you speedometer by the frame of your skate. Also we recommend to replace a wheel on the left skate if you want to wear the display on the right wrist and vice versa.

Attention: Please use adequate equipment to replace the wheel, e.g. a special Skate-Tool (not included in this package).

1. **Disassemble the axle of the wheel to replace.** The wheel is fixed to the frame of your skates by two screws to the left and the right of the frame. These screws form the axle. While you turn out one screw have an eye on the other screw as well. If the other screw begins to turn freely please fix it with you hand or another tool. Store the two screws carefully (Picture 2) for later reassembling.
2. **Extract the bearings of the wheel.** In the wheel you have disassembled you find two bearings and one spacer in the middle. You now have to take these bearings and the spacer out of the wheel. This is most easy with a special skate tool. If you don't have such a tool you can also use the cylindrical spacer type 1 in combination with a small screwdriver. If your skate uses a type 1 spacer you can push out the first bearing by placing the cylindrical MICROSPORT spacer on top of the original spacer (Picture 3) and press. The second bearing can then be pushed out from the inside (Picture 4). If

with your fingers into the hole of the orange MICROSPORT-Wheel (Picture 6).

4. **Place the correct spacer into the orange MICROSPORT-Wheel.** Decide which of the MICROSPORT-Spacers you need. Principally if your original spacer look cylindrical you need the cylindrical MICROSPORT-Spacer type 1. If your original spacer is a 1cm thick ring you need the 3mm MICROSPORT ring spacer. Now place the MICROSPORT Spacer into the MICROSPORT-Wheel (Pictures 7a+7b).
5. **Press the second bearing into the MICROSPORT Wheel.** The MICROSPORT-Spacer is now fixed between the two bearings (Picture 8). Use a screwdriver to fix a spacer type 2 in the center of the hole.
6. **Place the distance ring** (smallest of the delivered rings) **on the bearing of the inner side of the MICROSPORT-Wheel (Picture 9).** The inner side can be recognized by the significant hole to house the computer puck. The distance ring avoids that the wheel and the puck can touch each other and grind.
7. **Put the computer puck into the MICROSPORT-Wheel.** Please note, that the MICROSPORT logo which is a stylish M with transmission waves shows to the outside (Picture 10). The wheel is now prepared for reassembly into your skate. Therefore put the complete wheel into the frame again.
8. **Stick the long axle screw through the frame and the MICROSPORT-Wheel and fix it with the second, smaller screw on the other side of the frame (Picture 11).** Attention: If the wheel moves after tightening of the screws in the direction of the axle unscrew the axle one more time and place one or two of the outer spacers in front of the puck and behind the wheel to cover the distance (Picture 12). Now the axle can be put in again.
9. **Check that the puck does not turn with the wheel but keeps its fixed position while the wheel is spinning freely.**

You have completed the installation of the wheel now. You do not need any technical skills for the further steps. In just two minutes you can start your first trip.

2.2. Display (wrist watch)

The bracelet of the Basic-Display is extra long and can be adjusted with a ‘click’-lock individually. The bracelet of the Plus-Display is equipped with an elastic part under the actual watchcase which allows you to lengthen the bracelet. You can therefore decide between wearing the display directly on the wrist or over the recommended wrist pads.

Determining the perimeter of new wheels
The following list helps you to find the perimeter of your wheel. Diameter ∅ 72mm ⇔ PM 226; ∅ 76mm ⇔ PM 239; ∅ 78 mm ⇔ PM 245; ∅ 80 mm ⇔ PM 251.

Generally you can calculate the perimeter of a wheel from the diameter which is usually written on the wheel with the following formula: Perimeter = Diameter · 3,14

Usage of the MICROSPORT Speedometer with used wheels
You can easily use the Microsport speedometer with a used set of other skate wheels. Most skate brands allow the “rockering” of the skate wheels. This feature it meant to assemble wheels of different sizes into one frame. You can determine the ability of your skates by dismantling one wheel. When taking out the axle you can see a small plastic or metal part called “washer” with the whole for the axle. This hole is not in the centre of the washer so it depends of the installation of the washer which height the axle is built into the frame. If your MICROSPORT wheel is bigger than the others you have to built in the axle close to the boot. If your MICROSPORT wheel is smaller the axle should be close to the ground.

If „rockering“ is not possible with your skates please use the next bigger Microsport wheel. The exposure of this wheel will soon be worn out by the higher pressure on this wheel. The bigger size of the wheel does not effect the accuracy of the measurement. Pay attention that you always program the perimeter of the MICROSPORT wheel in the display and not hte perimeter of your other wheels.

Adjusting the perimeter for used wheels
The built in wear out function is based on the statistical normal use of skates. The real perimeter reduction may differ individually due to the conditions of the ground usually skated on as well as the weight and technique of the skater. If you get the feeling that the displayed perimeter differs from the real perimeter, you should reprogram the watch with the actual value to guarantee the precision of the measurement.

Measuring the actual perimeter of the wheel
To measure the actual perimeter of your wheel, make a dot on the MICROSPORT wheel. When you roll your skate over a piece of paper and mark the places when the dot is closest to

press the **MODE** button followed by the **SET** button. On the display you will see the ***PM*** icon. The pre-programmed perimeter is 239mm, which refers to a 76mm diameter. You can program values between 210mm and 251mm. Select your perimeter from the list above and press **SET** as long as you have reached the appropriate value.

2. When you have reached the correct value for the perimeter press **MODE** to confirm the programming.
3. You can now select between showing the results in miles (M) or in kilometres (Km). Press the **SET** button until you see the unit you want. Then press **MODE** to confirm.
4. The display is now ready for skating and changes automatically to the viewing mode.

2.2.2. Programming the Plus Display:

The Plus version of the MICROSPORT In-Line Skate Speedometer has additional features such as a watch, a lap- and a calorie-counter. These functions have to be programmed before usage. The calorie function is based on a research of the University of Massachusetts. To improve the accuracy of the measurement Microsport also integrates the number of skating steps in the individual calorie calculation.

1. **Setting the perimeter:** To enter the programming mode press **SET**. The LCD display the actual perimeter and the icon ***PM*** . The pre-programmed perimeter is 239 which is equivalent to a 76mm diameter wheel. The first digit of the perimeter is blinking. By pressing the **UP** and **DOWN** buttons you can switch to the correct value. Press **MODE** to confirm the programming. Proceed with the 2nd and 3rd digit as described above. After confirming the 3rd digit with **MODE** the display switches to the weight unit selection area.
2. You can chose between kilograms (KG) and pound (LBS) for the unit of the weight. Press **UP** or **DOWN** to select the preferred value and confirm with **MODE**.
3. Please enter your weight for the calorie-counter in the unit chosen before. This procedure is equivalent to the programming of the perimeter. Confirm each digit with the **MODE** button.
4. After confirming the weight with **MODE** you can select between showing the results in kilometres (KM) or miles (M). Switch between the units with the **UP** and **DOWN** buttons and confirm with **MODE**.

selected the weight unit to be pounds (LBS) the time will be displayed in am and pm otherwise in 0-23 hours mode.

3. Operating the Speedometer

3.1. In-Line Skate Speedometer BASIC

This chapter explains the usage and the effects of the different buttons of your speedometer. In the Basic version for different display modes can be separated:

1. Data Mode: This mode has to be activated during skating for recording your speed and distance information.
2. Viewing Mode: You can browse through the values stored during you last trip. The recording of data is not possible.
3. Programming Mode: Choose the velocity unit and set the correct perimeter of your MICROSPORT wheel.
4. Sleep Mode: The display is blank to reduce the battery consumption. Stored values are kept in the memory.

Data Mode

To activate the Data Mode press **START**. You can see a small wheel icon in the upper right corner of the display. This symbol indicates that the display is searching for a transmission of the puck. As soon as a correct puck signal is identified the symbol starts blinking and the display switches to the function you have used during the last trip. If the receiver can not detect a correct signal in 10 seconds the display returns to the Viewing Mode and the wheel icon vanishes.

If the connection between puck and display can not be established correctly you might check the following two reasons:

1. The puck is not transmitting. The transmission of the puck will be activated automatically when you turn the wheel. Please be sure that the MICROSPORT wheel is turning before you press **START**.
2. The battery power is low. Please change the batteries in the puck and the display according to the instructions in Chapter 4.

SPD	Actual speed
MX SPD	Maximum speed
AV SPD	Average speed
TRP TIME	Trip time
TRP DST	Trip distance
DST	Total distance
PM	Actual perimeter

During a break your speedometer can switch off automatically. First the wheel icon will vanish and the speedometer enters the Viewing Mode and after not pressing any buttons for 20 seconds the speedometer switches to the Sleep Mode. If you stop skating for a longer period please always switch off your speedometer by pressing **OFF**. This cuts the connection between transmitter and receiver and helps to save energy while the display enters the Viewing Mode,

Please be aware that the pushing **START-**, **SET-** and the **RESET-** buttons have no effect while the speedometer is in the Data Mode.

Viewing Mode

There are two ways to enter the Viewing Mode. Either by pressing **OFF** when the display is in the Data Mode or by pressing **MODE** when the display is in Sleep Mode.

In the Viewing Mode you can browse through the different speedometer functions by pressing **MODE** By pressing **RESET** the values for ***MX SPD***, ***AV SPD***, ***TRP TIME*** and ***TRP DST*** are reset to zero. In the Viewing Mode the pressing of **SET** lets you enter the Programming Mode and the Pressing of **START** activates the Data Mode.

If you don't press any button for more that 20 seconds the display automatically enters the Sleep Mode until you wake the display up again. Pressing the **OFF** button has no effect in the Viewing Mode.

Sleep Mode

It is the intention of the Sleep Mode to save your battery energy. You can leave the Sleep Mode either by pressing **MODE** to enter the Viewing Mode or by pressing **START** to activate the Data Mode.

manual.

Attention: In the unlikely event that the display does not react to any of your actions the display computer might have encountered a system failure. In this case of a breakdown please take out the battery, see section 4.1., for at least one minute for rebooting the display software.

3.2. In-Line Skate Speedometer PLUS

The black, central button of the Plus display will be referred to as **HOTKEY**. This chapter explains the usage and the effects of the different buttons of your Plus speedometer. In the Plus version for different display modes can be separated:

5. Time Mode: You can use your Plus speedometer as a normal watch. Additionally you can browse through the different stored values of your last trip.
6. Data Mode: This mode has to be activated during skating for recording your speed and distance information.
7. Programming Mode: You can set the wheel perimeter, weight and time. Also you can select between the units kilometres and miles as well as kilograms and pound
8. Sleep Mode: Switches off the display the values are stores as well as the watch works normally in the background.

1. Time Mode

a. The display shows the actual time. If you don't press any button between 2 hours the display automatically switches to Sleep Mode.
b. The **SET**-button activates the Programming Mode
c. The **START**-button activates the Data Mode
d. The **RESET**-button resets the internal buffer to zero for the following values:
    i. Average speed, ***Av SPD***
    ii. Maximum speed, ***Mx SPD***
    iii. Trip distance, ***Trp DST***
    iv. Trip time, ***Trp Time***
    v. Trip calories, ***Trp Cal***
e. The **MODE**-button enables you to select between the following functions:
    i. Actual speed, ***SPD***

f. The **HOTKEY** is programmed to show the following functions:
    i. Total distance, ***DST***
    ii. Perimeter, ***PM***
    iii. Maximum Speed, ***MX SPD***
    iv. Real Time, ***Time***

2. Sleep Mode

a. During the Sleep Mode the LCD of your display is switched off while your data and the watch continue to work in the background.
b. The pushing of any display button wakes up the Time Mode of the display and the actual time is shown.

3. Data Mode

a. You enter the Data Mode by pressing **START**. The display then show you the word **go** followed by a number. This number is part of the digital coding of your speedometer and identifies the puck of your speedometer. Normally you don't have to worry about that number only if you are skating together with another user of the Microsport In-Line Skate Speedometer Plus often and both displays show the same code number. In this case one of the skaters should remove his puck battery for at least 1 minute. After replacing the battery the puck randomly generates a new code number. After that reset the display software by pressing **SET, START, MODE** and **RESET** at the same time. The next time you press **START** after the reset the display will identify the next puck transmission with its code as the new transmitter.
b. If a correct signal is received the display shows you the actual speed.
c. If you don't receiver a correct signal after 10 seconds the display shows **Err**. After five additional seconds the display changes to the Time Mode.
d. While the display shows **go**or **Err** all other are frozen. Only the **HOTKEY** enables you to leave immediately to the Time Mode.
e. If the normal reception is interfered (Missing Data) the display shows you the word **Err**until the connection is restored. If the missing data status lasts longer then 10 seconds the display changes to the Time Mode. Please try to establish the connection again by pressing **START**. If you still can not get the signal please a. check whether the display is coded to your puck or b. the

iii. **RESET** -> Blocked in Data Mode

iv. **MODE** -> Shows you the following functions: ***SPD, Av Spd, Trp DST, Trp Cal, Trp Time, LP, Time***

v. **HOTKEY** -> Shows you the following functions: ***DST, PM, Mx SPD, Time***

4. Programming Mode

During the programming of the watch you can always leave this mode by pressing the **HOTKEY.** This might be useful if you don't want to program all features again. The different variables in the Programming Mode are discussed in Section 2.2.2.

Attention: In the case that the display does not reply of any of your inputs you can reset the display software by pressing **SET, START, MODE** and **RESET** at the same time. This will reboot your display software.

4. Changing the Batteries

The lifespan of the display battery and the puck battery are the same. If you need to replace the batteries please always change both. The changing of the batteries and the speedometer maintenance is very easy with the MICROSPORT Battery Service Kit. It contains of 2 CR 1632 batteries, o-rings and screws for maintaining the water resistance, a small screwdriver and an instruction manual. You can get the Battery Service Kit in your local sports store or at MICROSPORT at www.microsport.de.

4.1. Changing the display battery

Open the Watch Case Cover and carefully remove the old battery from the battery clip. Dismantle the isolator from the battery if present and attach it to the top (+) of the new battery. Insert the new battery of the type CR 1632 with + facing up and reinstall the battery clip. Close the back cover of the watch with the screws again. To check the successful installation press **MODE.**

If all segments of the display are on after installation you have entered the display test mode accidentally. Please try again until the display reacts normally

4.2. Changing of the puck battery

If you are using the Battery Service Kit for changing the batteries we recommend to replace the o-rings of the puck case as well. Also use the small o-rings for the screws for improved water resistance.

5. Troubleshooting

Problem: Nothing appears on the display.
Solution: Press **MODE,** if the display remains blank replace batteries of watch and electronic puck and press **MODE** again.

Problem: Display readings fade out.
Solution: Batteries of watch and electronic puck are running out and have to be replaced.

Problem: Slow display response.
Solution: The current temperature is higher or lower than the operating temperature of the speedometer (0 °C to 55 °C/ 32 °F to 131 °F).

Problem: Black display.
Solution: Temperature is too high, perhaps the display has been exposed to direct sunlight for too long.

Problem: Grinding of the electronic puck against the wheel.
Solution: Your bearings are worn out. Replace bearings. We recommend at least ABEC-1 quality.

Problem: The displayed actual speed seems not to be realistic.
Solution: A. The transmission may have been interrupted for a short time. Such an interruption has no significance for the accuracy of the measurement of the distance, as long as the interruption is not for longer than 1 kilometre.
B. The underlying wear-out function is not equivalent to the real usage of the wheels. Check the perimeter of the MICROSPORT wheel and correct the programming if necessary.

Problem: The communication between puck and display does not work.
Solution: A. The transmitter in the puck is not activated jet. Turning the MICROSPORT wheel activates the transmitter after one turn. Check the connection by pressing START.

found the best antenna position.

Your MICROSPORT-Team hopes you enjoy this unique In-Line Skate Speedometer.
Comments are always welcome.

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The MICROSPORT In-Line Skate Speedometer fulfils the following requirements for devices in the EU and the USA:

The devices comply to the requirements of **ETS 300 683** Electro Magnetic Compatibility (EMC) standard for Short Range Devices (SRD) operating on frequencies between 9 kHz and 25 GHz.

The devices comply with the requirements of EEC directive **89/336/EEC** with regard to Electromagnetic Compatibility and fulfil the requirements of **99/5/EC** with regard to Radio Equipment and Systems (RES); Electro Magnetic Compatibility (EMC) standard for Short Range Devices (SRD).

FCC-ID: OWUPK622-6

The devices comply with Part 15 of the FCC rules. Operation is subject to the following two conditions:

This device may not cause harmful interferences and this device must accept any interference received, including interference that may cause undesired operation.