V650 USER MANUAL

INTRODUCTION

Congratulations on your new V650! Designed for the most ambitious cyclist, the V650 helps you ride with confidence and reach your peak performance.

This user manual includes complete instructions to help you get the most out of your new riding companion. To check the video tutorials and the latest version of this user manual, please go to www.-polar.com/en/support/v650.

POLAR V650

The Polar V650 offers a host of unique features to help you ride better. Here you can find a summary of the most important ones.

- **Profiles**: The V650 has three profiles for cycling and one profile for other sports,which you can customize to fit your needs. You can, for example, set up to six training views for each profile, one training view containing up to eight data fields.

- **Integrated GPS**: With an integrated GPS, the V650 tracks your cycling speed, distance and route. The **Back-to-start** and **Route tracking** features help you to travel all the way back to the starting point of your trip.
- **Barometric Pressure Sensor**: In addition to altitude, your V650 measures comprehensive data such as ascent/descent, incline/decline, real time VAM (mean ascent velocity), temperature and altitude compensated calories.
- **Training Load & Recovery**: This feature is available in the Polar Flow web service. It shows how much each training session loaded you, and how long it takes you to recover from it, helping you find the perfect balance between training and rest.
- **Training Benefit**: The V650 gives motivating feedback about the effect of your training immediately after your session.

USB CABLE

Charge and transfer data with the USB cable

POLAR FLOW WEB SERVICE

Polar V650 is a great training device by itself, but you will benefit even more by using it with the Polar Flow web service.

The Polar Flow web service provides you with an in-depth analysis of your training. Plan your training or utilize ready made training programs. See your route on a map and receive detailed information about your session. Track your training load and recovery to stay fresh. Share your training results and route with others in the community.

GET STARTED

CHARGE THE BATTERY

The V650 has an internal, rechargable battery. Use the USB cable included in the product set to charge your V650 via the USB connector on your computer.

1. Plug in your V650 to your computer's USB port with the USB cable.
2. The charging animation appears on the display. Charging the battery fully takes up to five hours.

INITIAL SETUP

Wake up your V650 by pressing the side button. The first time you do this, your V650 will take you through an initial set up process.

Start by choosing your language from the following options: **Dansk**, **Deutsch**, **English**, **Español**, **Français**, **Italiano**, **Japanese**, **Nederlands**, **Norsk**, **Português**, **Suomi**, **Svenska** of **Simplified Chinese**.

If your language is not visible, swipe up to scroll the list. Choose a language by tapping it. The field turns to red. Confirm and proceed to the following setting by tapping ▶ at the bottom of the screen.

INFO: To get the most accurate and personal training data, it's important that you're precise with physical settings like your age, weight and sex.

Units: Choose **Metric** (kg/cm) or **Imperial** (lb/ft) units.

Time of day: Change the time format by touching 12h/24h (image). The chosen time format is written in white. If you choose the **12h** time format, also select **AM** or **PM**. Then enter the local time.

Use GPS time: If you want the V650 to read the Coordinated Universal Time (UTC) from the GPS satellites, tick the box and choose the UTC Time Zone that is closest to you.

Date: Enter current date.

Sex: Select **Male** or **Female**.

Height: Enter your height.

Weight: Enter your weight.

Date of birth: Enter your date of birth.

To change your settings, tap ◀ at the bottom of the screen to return to the desired setting. To accept the settings, tap ▶. The V650 enters the main view.

MENU AND FUNCTIONS

MENU ITEMS

1. **HISTORY**: See the details of your sessions and the totals of your cycling history.
2. **PULL-DOWN MENU**: Swipe down to open the pull-down menu. There you can adjust the front LED and the volume.
3. **SETTINGS**: Modify the settings to suit your needs.
4. **PROFILE** : Select the profile for your ride.
5. **BIKE**: Select the bike for your ride.
6. **ICONS**: See the status of GPS and sensors.

BUTTON FUNCTIONS

There is one physical button on the side of the V650 and another button on the front.

1. Press the side button to view the following options:
    - Calibrate sensors
    - Lock screen
    - Turn off the device
2. Press the front button to start and pause recording. Alternatively, you can set the button to take a lap. See Sport profile settings for instructions.

TOUCH SCREEN FUNCTIONS

Tap

- Open what you tap
- Choose an item. The item you choose, turns to red.
- Return to the previous level or proceed further by tapping the arrow at the bottom of the screen
- In certain settings, you can toggle the values directly from the menu by tapping the item until the correct value is displayed.

Swipe right or left

- Switch training views during training
- Browse training view layouts in Sport Profile Settings
- Scroll details of your training session in History

Swipe down from the top edge of the screen Open the pull-down menu. There you can adjust the safety light, the backlight and the training sounds.	
Swipe up or down Scroll through what's on the screen.	

GET READY FOR A RIDE

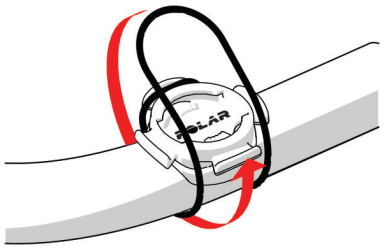
INSTALL BIKE MOUNT

You can install the bike mount on the stem or on the left- or right-hand side of the handlebar.

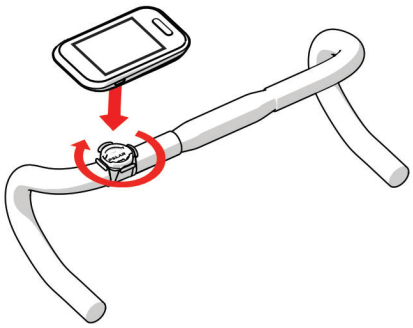
1. Place the rubber base on the stem/handlebar

2. Position the bike mount on the rubber base so the POLAR logo is in line with the handlebar.

3. Secure the bike mount on to the stem/handlebar with the O-ring.



4. Align the ledges on the back of the V650 with the slots on the bike mount and turn clockwise until the V650 is in its place.



SET UP ACCESSORIES

Set up an optional sensor as instructed in the sensor's user manual. When you activate an optional sensor for the first time, it needs to be paired with the V650. For more information, see **General Settings** in Settings.

CUSTOMIZE SPORT PROFILES

V650 has three profiles for cycling (and one profile for other sports).

Adjust the settings for the sport profiles to suit your training needs in **SETTINGS** > **Sport profiles**. You can, for example, customize each profile with up to six different training views, to see the information you really want.

TRAINING

WEAR THE HEART RATE SENSOR

When you use our heart rate sensors when training, you get the most out of Polar's unique smart coaching features. Heart rate data gives you an insight into your physical condition and how your body responds to training. This will help you fine-tune your training plans and reach your peak performance.

Although there are many subjective clues as to how your body is doing during exercise (perceived exertion, breathing rate, physical sensations), none is as reliable as measuring heart rate. It is objective and is affected by both internal and external factors - meaning you will have a dependable measure of your physical state.

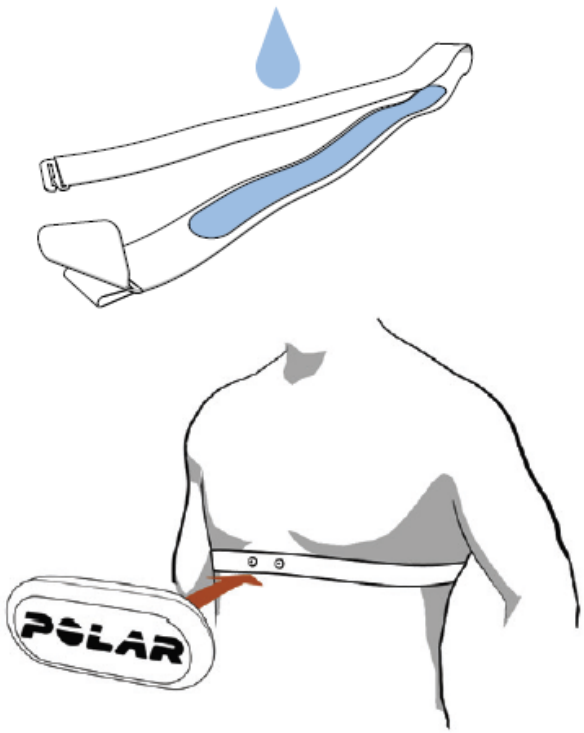
A heart rate monitor gives you a physiological window, through accurate heart rate measurement, into your body's response to the moment-to-moment changes in your physical activity.

1. Moisten the electrode area of the strap.

2. Attach the connector to the strap.

3. Tie the strap around your chest, just below the chest muscles, and attach the hook to the other end of the strap. Adjust the strap length to fit tightly but comfortably.

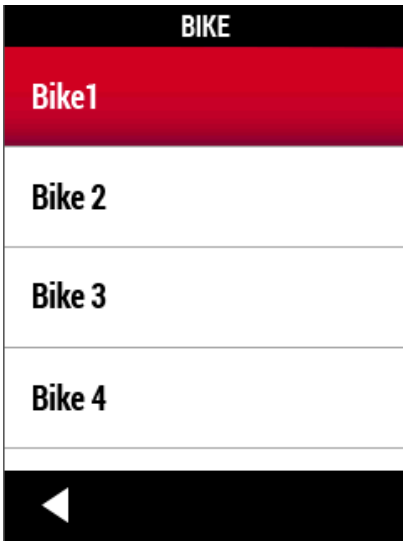
4.Check that the moist electrode areas are firmly against your skin and that the Polar logo of the connector is in a central and upright position.



INFO: Detach the connector from the strap, and rinse the strap under running water after every training session. Sweat and moisture may keep the heart rate sensor activated, so also remember to wipe it dry.

START A TRAINING SESSION

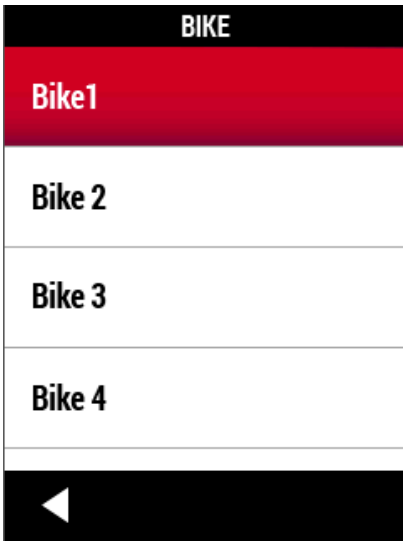
1. Go to **PROFILE** to choose **Road biking**, **Mountain biking**, **Indoor cycling** or **Other**. Tap to confirm.



If you have turned on GPS in the profile you chose, the V650 automatically starts searching for the GPS satellite signals.

- Keep your V650 still with the display facing upwards during the search. It typically takes 30-60 seconds the first time. On future occasions it should take only a few seconds.
- The V650 is ready once the GPS icon is fully rounded with a green circle.

2. Go to **BIKE** to choose **Bike 1**, **Bike 2**, **Bike 3** or **Bike 4**. Tap to confirm.



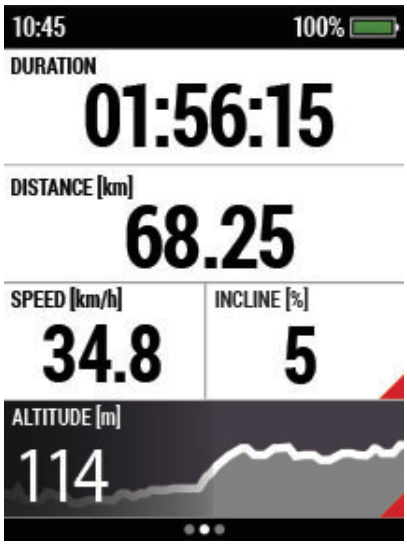
If you have linked compatible bluetooth smart sensor to the bike, your V650 automatically starts searching a for the signals from the sensors.

Wait until the symbol on the display turns green to indicate V650 has found the sensor.

3. Press the front button to begin your ride.

YOUR TRAINING DATA

You can choose the information you want to see during your rides in **Settings** > **Profiles** > **"profile"** > **Training Views**. As an example of how the information is displayed, see the default training views of the profile **Road biking**:



Change the training views with a quick swipe across the screen.

The red triangle indicates that you can quickly toggle the information shown, from speed to average speed, for example.

The below tables presents the data fields, which you can choose for your training views:

Data	On the display
Altitude Current altitude	
Altitude graph Altitude graph displays the elevation in feet or meters	
Ascent Ascended meters/feet	
Barometer	

Data	On the display
Back to start This feature guides you back to the starting point. For more infromation, see Back to Starting Point Iso widget nuolella, muuten pelkkä etäisyys km	
Cadence Speed at which you turn the cranks of your bicycle	
Cadence avg Average speed at which you turn the cranks of your bicycle	
Calories The expended calories so far. The cumulation of calories starts when your heart rate is displayed.	
Distance The distance you've traveled during the ride	
Duration Total duration of your training session so far	
Heading The direction you are moving	
Heart rate Your heart rate in beats per minute (BPM) or percent of max-	

Data	On the display
imum hear rate (%)	
HR zones Time spend on each zone	
HR graph	
HR avg Your average heart rate	
Inclination Your average heart rate	
Lap time	
Lap distance	
Route	
Speed Current speed (km/h or mph)	
Speed avg Average speed (km/h or mph)	
Speed graph	

Data	On the display
Shows your current speed (km/h or mph) and the latest speed changes in a graphical form	
Temperature Current temperature	
Time of day Current time of day	
VAM Ascent in feet/meters per hour	

BACK TO STARTING POINT

The Back to starting point feature guides your way back to the starting point. When theV650 finds the GPS satellite signals in the beginning of the training session, your location is saved as a starting point.

When it is time to return to your starting point, do the following:

- Browse to the BACK TO START-view.
- Keep moving in order for theV650 to determine which direction you are going. An arrow will point in the direction of your starting point.
- To get back to the starting point, turn in the direction of the arrow.
- The V65 0also shows direction coordinates and the direct distance (beeline) between you and the starting point (?).

When you reach the starting point, Starting point reached (?) is displayed.

INFO: Always keep a map at hand in case the RC3 GPS loses the satellite signal or the battery runs out.

INFO: This feature uses the GPS function. Set GPS on in Sport Profile Settings.

FUNCTIONS DURING TRAINING

Delete this text and replace it with your own content.

PAUSE AND STOP TRAINING

1.To pause training recording, press the front button. To continue training recording, choose **CONTINUE**.

INFO: If you have set the front button to take a lap, long-press it to pause recording.

2. To stop recording completely, choose STOP.

3. The following summary of your training information is displayed

- Textual feedback, for example Steady state training+, is displayed if you trained at least a total of 10 minutes in the sport zones. See the feedback in more detail in Training Files. For more information, see Training Benefit.

Care for your heart rate sensor after training. Detach the connector from the strap and rinse the strap under running water after every use. For complete care and maintenance instructions, see Caring for Your Product.

ANALYZING

HISTORY

The V650 saves the basic data of your ride in **History** > **Sessions**. There you can see a list of stored sessions with the following information; profile, date and start time. Select a session to view the details.

Browse the session history by swiping left or right. Here's an example of session history:

IMAGE

The V650 records your training data when the training session has lasted at least one minute.

For deeper analysis, transfer your training history to Polar Flow web service with the USB cable and FlowSync software. The web service offers various options to analyze the data with.

TOTALS

To view totals of the training files go to **History** > **Totals**

TRAINING BENEFIT

The Training Benefit feature helps you better understand the effectiveness of your training. This feature requires the use of the heart rate sensor. After each training session you get textual feedback on your performance providing that you have trained at least a total of 10 minutes in the sport zones. The feedback is based on training time distribution on sport zones, calorie expenditure and duration. In Training Files you get the feedback in more detail. The descriptions of different training benefit options are listed in the table below

Feedback	Benefit
Maximum training+	That was a hard session! You improved your sprint speed and the nervous system of your muscles, which make you more efficient. This session also increased your resistance to fatigue.
Maximum training	That was a hard session! You improved your sprint speed and the nervous system of your muscles, which make you more efficient.
Maximum & Tempo training	What a session! You improved your speed and efficiency. This session also significantly developed your aerobic fitness and your ability to sustain high intensity effort for longer.
Tempo & Maximum training	What a session! You significantly improved your aerobic fitness and your ability to sustain high intensity effort for longer. This session also developed your speed and efficiency.
Tempo training+	Great pace in a long session! You improved your aerobic fitness, speed, and ability to

	sustain high intensity effort for longer. This session also increased your resistance to fatigue.
Tempo training	Great pace! You improved your aerobic fitness, speed, and ability to sustain high intensity effort for longer.
Tempo & Steady state training	Good pace! You improved your ability to sustain high intensity effort for longer. This session also developed your aerobic fitness and the endurance of your muscles.
Steady state & Tempo training	Good pace! You improved your aerobic fitness and the endurance of your muscles. This session also developed your ability to sustain high intensity effort for longer.
Steady state training +	Excellent! This long session improved the endurance of your muscles and your aerobic fitness. It also increased your resistance to fatigue.
Steady state training	Excellent! You improved the endurance of your muscles and your aerobic fitness.
Steady state & Basic training, long	Excellent! This long session improved the endurance of your muscles and your aerobic fitness. It also developed your basic endurance and your body's ability to burn fat during exercise.
Steady state & Basic training	Excellent! You improved the endurance of your muscles and your aerobic fitness. This session also developed your basic endurance and your body's ability to burn fat during exercise.
Basic & Steady state training, long	Great! This long session improved your basic endurance and your body's ability to burn fat during exercise. It also developed the endurance of your muscles and your aerobic fitness.
Basic & Steady state training	Great! You improved your basic endurance and your body's ability to burn fat during exercise. This session also developed the endurance of your muscles and your aerobic fitness.
Basic training, long	Great! This long, low intensity session improved your basic endurance and your body's ability to burn fat during exercise.
Basic training	Well done! This low intensity session improved your basic endurance and your body's ability to burn fat during exercise.
Recovery training	Very nice session for your recovery. Light exercise like this allows your body to adapt to your training.

TRAINING LOAD

The training load feature in the calendar view in Polar Flow web service will conveniently tell you how hard your training session was, and how much time is needed for complete recovery.This feature tells you if you have recovered enough for your next session, helping you find the balance between rest and training. In Polar Flow web sercive you can control your total workload, optimize your training, and monitor your performance development.

Training load takes into consideration different factors which affect your training load and recovery time, such as heart rate during training, duration of training, and your individual factors, e.g. sex, age, height, and weight. Continuous monitoring of training load and recovery will help you recognize personal limits, avoid over or under training, and adjust training intensity and duration according to your daily and weekly targets.

Training Load feature helps you to control total workload, optimize your training, and monitor your performance development. The feature makes different kinds of training sessions comparable with each other, and helps you to find the perfect balance between rest and training.

SETTINGS

GENERAL SETTINGS

PAIRING

Before taking a new sensor into use, it has to be introduced to your V650. This is called pairing and only takes a few seconds. Pairing ensures that the V650 receives signals from your sensor only, and enables disturbance-free training in a group. You can, for example, activate the sensors you want to use in different sports. When you start a riding session using the sport profile, the V650 detects the needed sensors automatically.

To pair, select **Pair new device**. The V650 lists the sensors it finds. Tap the sensor you want to pair.

View all the devices you have paired with your V650 in **Paired devices**. These can include heart rate sensors, speed sensors and cadence sensors.

USE GPS TIME

If you want the V650 to read the Coordinated Universal Time (UTC) from the GPS satellites, tick the box in **USE GPS TIME** field, and choose the UTC Time Zone that is closest to you.

TIME

Tap the **TIME** field to enter local time. Confirm and return to previous menu by tapping ◀.

INFO: If you want to change the time format, tap 12h/24h (image).The currently selected format that is written in white. If you choose the **12h** time format, also select **AM** or **PM**.

DATE

Tap the **DATE** field to enter the date.

LANGUAGE

Tap the **LANGUAGE** field to enter the language settings. Choose a language from the list by tapping the language field.

UNITS

Tap the **UNITS** field to toggle between **Metric** and **Imperial**.

PIN CODE LOCK

You can set the V650 to ask for a PIN code every time it is turned one. Tap the **PIN CODE LOCK** field. Enter a four-digit PIN code and tap . Re-enter and confirm by tapping .

SAFETY LIGHT

Manual: Turn the safety light on manually from the pull-down menu. Adjust the **Blink rate** by dragging the slider.

Automatic: The V650 turns on the safety light according to predefined activation level. Adjust the **Activation level** and the **Blink rate** by dragging the slider.

DISPLAY BACKLIGHT

Manual: Turn the backlight on manually from the pull-down menu.

Always on:

Automatic: The backlight turns on automatically according to predefined activation level. Adjust the activation level by dragging the slider.

AUTOMATIC POWER OFF

Tap the **AUTOMATIC POWER OFF** field to toggle **On**/**Off**.

ABOUT V650

SPORT PROFILES

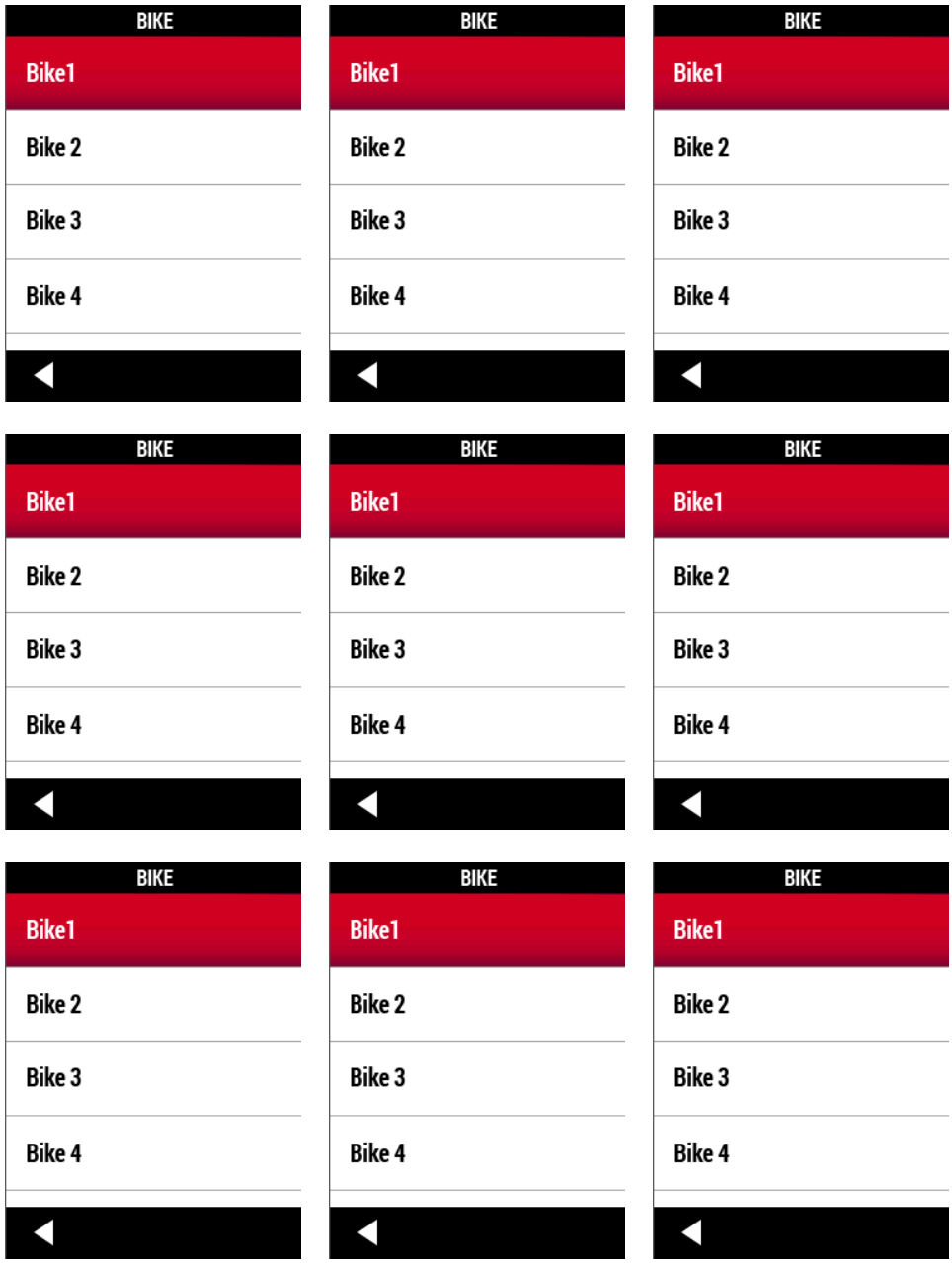
TRAINING VIEWS

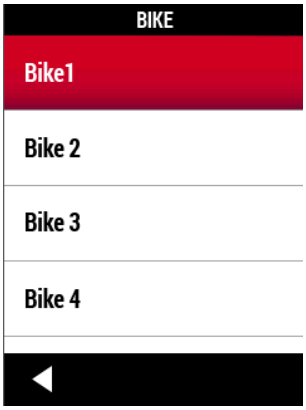
You can set up to six training views for each profile, each training view containing up to eight data fields. In addition, you can choose an additional lap view.

Tap **TRAINING VIEWS** to enter the settings.

1. Tick the box on the left side of **View 1**, **View 2**, **View 3**, **View 4**, **View 5** or **View 6** to choose it. Tap the field to edit the view.

2. Swipe left or right to find a desired layout for the view. These are the options:





3. Once you have chosen the layout, you can change the data displayed. Tap the data field and choose a data from the list. The data options depend on the layout. See full list of options in....
4. When the layout is complete, return to the **TRAINING VIEWS** menu by tapping ◀.
5. If you want to set more training views for the profile, repeat the steps 1-5 .
6. If you want to set the **Lap view** on in this profile, tick the box in the field **Lap view**.
7. Then, when you're ready, tap ◀ in **TRAINING VIEWS** menu to save your changes.

HR VIEW

Tap the **HR view** field to toggle between **%** (percent of maximum heart rate) or **bpm** (beats per minute).

SPEED

Tap the **Speed** field to toggle between **km/h** or **min/km**.

TRAINING SOUNDS

Tap the **Training sounds** field to toggle between **Mute**, **Soft**, **Loud** and **Very loud**.

GPS

Tap the **GPS** field to toggle **On**/**Off**.

AUTOMATIC PAUSE

Automatic pause: Tap the field to enter the setting.

1. Tick the box to turn on **Automatic pause**.
2. Tap **Activation speed** to set the speed when the **Automatic pause** is activated.

AUTOMATIC LAP

Tap the **Automatic lap** field to enter the setting.

1. Tick the box to turn on **Automatic lap**.

2. Tap **Duration**/**Distance** to set the automatic lap duration or distance. You can toggle between duration and distance by touching (kuva). The currently selected is written in white.

FRONT BUTTON TAKES LAP

Tap the **Front button takes lap**field to toggle **On**/**Off**

INFO: As default, pressing the front button pauses training recording. If you set the front button to take a lap, long-press it to pause recording.

CHECK HR ZONE LIMITS

Check HR zone limits

BIKE SETTINGS

Adjust the bike setting in **Settings** > **Bike Settings**. Set a name (service only) and a wheel size to each bike. Pair new devices with V650 and link them to a bike. When you select a bike for your ride, the V650 detects the linked devices automatically.

BIKE NAME

WHEEL SIZE (cm): Set the wheel size to xxx cm. For more information, see measuring the wheel size.

SENSORS: View all the sensors you have linked to the bike.

PHYSICAL SETTINGS

It is important that you are precise with the physical settings, especially when setting your weight, height, date of birth and sex, as they have an impact on the accuracy of the measuring values, such as the heart rate limits and calorie expenditure.

SEX

Tap the **SEX**field to toggle between **Male** or **Female**.

HEIGHT

Tap the **HEIGHT** field to set your height. Confirm and return to previous menu by tapping .

WEIGHT

Tap the **WEIGHT** field to set your weight.

DATE OF BIRTH

Tap the **DATE OF BIRTH** field to set your date of birth.

HR MAX

HR MAX:Set your maximum heart rate, if you know your laboratory measured current maximum heart rate value. Your age-predicted maximum heart rate value (220-age) is displayed as a default setting when you set this value for the first time.

About maximum heart rate

HR_{max} is used to estimate energy expenditure. HR_{max} is the highest number of heart-beats per minute during maximum physical exertion. HR_{max} is also useful when determining training intensity. The most accurate method for determining your individual HR_{max} is to perform a maximal exercise stress test in a laboratory.

RESTING HR

RESTING HR: Set your resting heart rate.

About resting heart rate

A person's resting heart rate (HR_{rest}) is the lowest number of heart beats per minute (bpm) when fully relaxed and without distractions. Age, fitness level, genetics, health status and gender affect the HR_{rest}. HR_{rest} is decreased as the result of cardiovascular conditioning. A normal value for an adult is 60-80 bpm, but for top athletes it can be below 30 bpm. An exceptionally high HR_{rest} can be a sign of over-exertion or illness.

VO2 MAX

VO2max: Set your maximal oxygen uptake, $VO2_{max}$.

About $VO2_{max}$

A clear link exists between oxygen consumption (VO2) of the body and cardiorespiratory fitness because oxygen delivery to tissues is dependent on lung and heart function. $VO2_{max}$ (maximal oxygen uptake, maximal aerobic power) is the maximal rate at which oxygen can be used by the body during maximal work; it is related directly to the maximal capacity of the heart to deliver blood to the muscles. $VO2_{max}$ can be measured or predicted by fitness tests (e.g. maximal tests, submaximal tests, Polar Fitness Test). $VO2_{max}$ is a good index of cardiorespiratory fitness and a good predictor of performance capability in aerobic events such as distance running, cycling, cross-country skiing, and swimming.

$VO2_{max}$ can be expressed either as milliliters per minute (ml/min = ml ■ min-1) or this value can be divided by the person's body weight in kilograms (ml/kg/min = ml ■ kg-1■ min-1).

The relationship between oxygen uptake (VO2) and heart rate (HR) is linear within an individual during dynamic exercise. Percentages of VO_{2max} can be changed to % of HR_{max} with the following formula: $\%HR_{max} = (\%VO2_{max} + 28.12)/1.28$.

$VO2_{max}$ is the basic variable of the intensity of exercise. When determining target exercise intensities heart rate is more practical and useful because it is easily and non-invasively obtained, e.g. on-line during exercise with heart rate monitors.

SMART COACHING

POLAR HEART RATE ZONES

Polar heart rate zones introduce a new level of effectiveness in heart rate-based training. Training is divided into five heart rate zones based on percentages of maximum heart rate. With heart rate zones, you can easily select and monitor training intensities.

HRmax = Maximum heart rate (220-age). Example: 30 years old, 220–30=190 bpm.

Training in heart rate zone 1 is done at a very low intensity. The main training principle is that performance improves when recovering after, and not only during training. Accelerate the recovery process with very light intensity training.

Training in heart rate zone 2 is for endurance training, an essential part of any training program. Training sessions in this zone are easy and aerobic. Long-duration training in this light zone results in effective energy expenditure. Progress will require persistence.

Aerobic power is enhanced in heart rate zone 3. The training intensity is higher than in sport zones 1 and 2, but still mainly aerobic. Training in sport zone 3 may, for example, consist of intervals followed by recovery. Training in this zone is especially effective for improving the efficiency of blood circulation in the heart and skeletal muscles.

If your goal is to compete at top potential, you will have to train in heart rate zones 4 and 5. In these zones, you exercise anaerobically in intervals of up to 10 minutes. The shorter the interval, the higher the intensity. Sufficient recovery between intervals is very important. The training pattern in zones 4 and 5 is designed to produce peak performance.

The Polar target heart rate zones can be personalized by using a laboratory measured HRmax value, or by taking a field test to measure the value yourself. When training in a target heart rate zone, try to make use of the entire zone. The mid-zone is a good target, but keeping your heart rate at that exact level all the time is not necessary. Heart rate gradually adjusts to training intensity. For instance, when crossing from heart rate target zone 1 to 3, the circulatory system and heart rate will adjust in 3-5 minutes.

Heart rate responds to training intensity depending on factors such as fitness and recovery levels, as well as environmental factors. It is important to look out for subjective feelings of fatigue, and to adjust your training program accordingly.

BATTERY INFORMATION

CHARGING

The V650 has an internal, rechargable battery. Use the USB cable included in the product set to charge your V650 via the USB connector on your computer.

1. Plug in your V650 to your computer's USB port with the USB cable.
2. The charging animation appears on the display. Charging the battery fully takes up to five hours.

INFO: Use a USB 2.0 compliant USB A-to-micro B cable included in the set package. If you charge from a USB hub, for example, the charging time might be prolonged. If you use an AC adapter, make sure that the adapter is marked with "output 5Vdc 0.5A - 2A max". Only use an AC adapter which is adequately safety approved (marked with "LPS", "Limited Power Supply" or "UL listed").

OPERATING TIME

Battery operating time depends on many factors, such as the temperature of the environment in which you use your V650, the features you select and use, and battery aging. The operating time is significantly reduced in temperatures well below freezing.

You can increase the battery operating time significantly by using Available Accessories instead of the GPS function for measuring speed and distance when you do not need route information.

BATTERY STATUS INDICATION

The battery icon in the upper right hand corner of the display shows the battery charging status and approximately how much charge is left in the battery.

IMPORTANT INFORMATION

CARE AND MAINTENANCE

Like any electronic device, the Polar V650 should be treated with care. The suggestions below will help you fulfil guarantee obligations and enjoy this product for many years to come.

POLAR V650

Keep your training computer clean. Use a damp paper towel to wipe dirt from the training computer. To maintain the water resistance, do not wash the training computer with a pressure washer. Do not immerse the training computer in water. Never use alcohol or any abrasive material such as steel wool or cleaning chemicals.

After each time of using the USB port of the training computer, check visually that there is no hair, dust or other dirt on the sealing surface area of the lid/back case. Gently wipe to remove any dirt. Do not use any sharp tools or equipment for cleaning, which could cause scratches to the plastic parts.

INFO: Not suitable for bathing or swimming. Protected against wash splashes and raindrops. Do not immerse the training computer in water. Using the training computer in excessive rainfall may cause interference on GPS reception

HEART RATE SENSOR

Connector: Detach the connector from the strap after every use and dry the connector with a soft towel. Clean the connector with a mild soap and water solution when needed. Never use alcohol or any abrasive material (eg. steel wool or cleaning chemicals).

Strap: Rinse the strap under running water after every use and hang to dry. Clean the strap gently with a mild soap and water solution when needed. Do not use moisturizing soaps, because they can leave residue on the strap. Do not soak, iron, dry clean or bleach the strap. Do not stretch the strap or bend the electrode areas sharply.

INFO: Check the washing instructions on the label of the strap.

SPEED SENSOR AND CADENCE SENSOR

Clean the sensors with a mild soap and water solution and rinse them with clean water. To maintain the water resistance, do not wash the sensors with a pressure washer. Do not immerse the speed sensor or cadence sensor in water. Never use alcohol or any abrasive material such as steel wool or cleaning chemicals.

Avoid hard hits to the sensors, as these may damage the sensor units.

Storing

Keep your training computer and sensors in a cool and dry place. Do not keep them in a damp environment, in non-breathable material (a plastic bag or a sports bag) nor with conductive material (a wet towel). Do not

expose the training computer to direct sunlight for extended periods, such as by leaving it in a car or mounted on the bike mount.

It is recommended to store the training computer partially or fully charged. The battery slowly loses its charge when it is stored. If you are going to store the training computer for several months, it is recommended to recharge it after a few months. This will prolong the battery lifetime.

Dry and store the strap and the connector separately to maximize the heart rate sensor battery lifetime. Keep the heart rate sensor in a cool and dry place. To prevent snap oxidation, do not store the heart rate sensor wet in non-breathing material, such as a sports bag. Do not expose the heart rate sensor to direct sunlight for extended periods.

Service

During the two-year guarantee/warranty period we recommend that you have service done by an authorized Polar Service Center only. The warranty does not cover damage or consequential damage caused by service not authorized by Polar Electro. For further information, see Limited International Polar Guarantee.

For contact information and all Polar Service Center addresses, visit www.polar.com/support and country-specific websites.

Register your Polar product at http://register.polar.fi/ to ensure we can keep improving our products and services to better meet your needs.

INFO: The username for your Polar Account is always your email address. The same username and password are valid for Polar product registration, polarpersonaltrainer.com, Polar discussion forum and newsletter registration.

BATTERIES

The Polar V650 cycling computer has an internal, rechargable battery.At the end of the working life of the product Polar encourages you to minimize possible effects of waste on the environment and human health by following local waste disposal regulations and, where possible, utilizing separate collection of electronic devices. Do not dispose of this product as unsorted municipal waste.

The Polar H6 heart rate sensor has a user changeable battery. To change the battery yourself, please follow the instructions carefully as instructed in chapter Change the Heart Rate Sensor Battery.

The batteries for the speed sensor and cadence sensor cannot be replaced. Polar has designed the sensors to be sealed in order to maximise mechanical longevity and reliability. The sensors have long-life batteries inside. To purchase a new sensor contact your authorized Polar Service Center or retailer.

Keep the batteries away from children. If swallowed, contact a doctor immediately. Batteries should be disposed of properly according to local regulations.

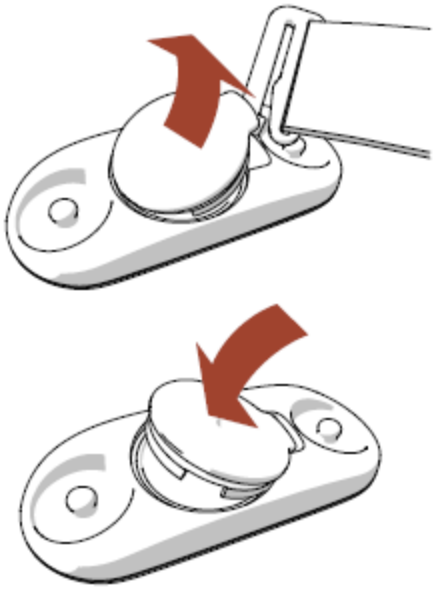
CHANGE THE HEART RATE SENSOR BATTERY

To change the battery of the heart rate sensor yourself, carefully follow the instructions below:

When changing the battery, make sure the sealing ring is not damaged, in which case you should replace it with a new one. You can purchase the sealing ring/battery kits at well-equipped Polar retailers and authorized Polar Services. In the USA and Canada, the additional sealing rings are available at authorized Polar Service Centers. In the USA the sealing ring/battery kits are also available at www.shoppolar.com.

When handling a new, fully charged battery, avoid clasp-like contact, i.e. simultaneously from both sides, with metal or electrically conducting tools, like tweezers. This may short circuit the battery, causing it to discharge more rapidly. Typically, short circuiting does not damage the battery, but it may decrease the capacity and the lifetime of the battery.

1. Lever the battery cover open by using the clip on the strap.
2. Remove the old battery from the battery cover with a suitable sized small rigid stick or bar, such as a toothpick. A non-metal tool is preferable. Be careful not to damage the battery cover.
3. Insert a new battery (CR 2025) inside the cover with the negative (-) side facing up.
4. Align the ledge on the battery cover with the slot on the connector and press the battery cover back into place. You should hear a snap.



Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

PRECAUTIONS

The Polar V650 shows your performance indicators. The training computer is designed to indicate the level of physiological strain and recovery during and after an exercise session. It measures heart rate, speed and distance. It also measures cycling cadence when used with a cadence sensor. No other use is intended or implied.

The training computer should not be used for obtaining environmental measurements that require professional or industrial precision.

INTERFERENCE DURING TRAINING

Electromagnetic Interference and Training Equipment

Disturbance may occur near electrical devices. Also WLAN base stations may cause interference when training with the training computer. To avoid erratic reading or misbehavior, move away from possible sources of disturbance.

Training equipment with electronic or electrical components such as LED displays, motors and electrical brakes may cause interfering stray signals. To solve these problems, try the following:

1. Remove the heart rate sensor strap from your chest and use the training equipment as you would normally.

2. Move the training computer around until you find an area in which it displays no stray reading or does not flash the heart symbol. Interference is often worst directly in front of the display panel of the equipment, while the left or right side of the display is relatively free of disturbance.

3. Put the heart rate sensor strap back on your chest and keep the training computer in this interference-free area as much as possible.

If the training computer still does not work with the training equipment, it may be electrically too noisy for wireless heart rate measurement. For further information, see www.polar.com/support.

Parts of RC3 GPS are magnetic. It may attract metallic materials and it's magnetic field may interfere with a compass. To avoid interference, it is recommended to wear your compass on one arm (at the level of your chest) and your RC3 GPS on the other arm's wrist. Do not place credit cards or other magnetic storage media near RC3 GPS, because information stored on them may be erased.

MINIMIZING RISKS WHEN TRAINING

Training may include some risk. Before beginning a regular training program, it is recommended that you answer the following questions concerning your health status. If you answer yes to any of these questions, we recommend that you consult a doctor before starting any training program.

• Have you been physically inactive for the past 5 years?

• Do you have high blood pressure or high blood cholesterol?

• Are you taking any blood pressure or heart medication?

• Do you have a history of breathing problems?

• Do you have symptoms of any disease?

• Are you recovering from a serious illness or medical treatment?

• Do you use a pacemaker or other implanted electronic device?

• Do you smoke?

• Are you pregnant?

Note that in addition to training intensity, medications for heart conditions, blood pressure, psychological conditions, asthma, breathing, etc., as well as some energy drinks, alcohol, and nicotine may also affect heart rate.

It is important to be sensitive to your body's responses during training. If you feel unexpected pain or excessive fatigue when training, it is recommended that you stop the training or continue at a lighter intensity.

Note! If you are using a pacemaker, you can use Polar training computers. In theory interference to pacemaker caused by Polar products should not be possible. In practice no reports exist to suggest anyone ever having experienced interference. We cannot however issue an official guarantee on our products' suitability with all pacemakers or other implanted devices due to the variety of devices available. If you have any doubts, or if you experience any unusual sensations while using Polar products, please consult your physician or contact the implanted electronic device manufacturer to determine safety in your case.

If you are allergic to any substance that comes into contact with your skin or if you suspect an allergic reaction due to using the product, check the listed materials in Technical Specifications. To avoid any skin reaction to the heart rate sensor, wear it over a shirt, but moisten the shirt well under the electrodes to ensure flawless operation.

Your safety is important to us. The shape of the s3+ stride sensor is designed to minimize the possibility of it getting caught in something. In any case, be careful when running with the stride sensor in brushwood, for example.

INFO: The combined impact of moisture and intense abrasion may cause a black color to come off the heart rate sensor's surface, possibly staining light-colored clothes. If you use perfume or insect repellent on your skin, you must ensure that it does not come into contact with the training computer or the heart rate sensor.

TECHNICAL SPECIFICATIONS

POLAR V650

Battery type:	Rechargeable 1900 mAh Li-ion Polymer battery
Operating time:	10 h
Operating temperature:	-20 °C to +50 °C / -4 °F to 122 °F
V650 materials:	Acrylonitrile butadiene styrene (ABS), Polycarbonate (PC), Asahi Dragontrail (glass), Polyamide (PA)
Bikemount materials:	Polyoxymethylene (POM)
Watch accuracy:	

GPS accuracy:	
Altitude accuracy:	
Ascent/Descent resolution:	
Maximum altitude:	
Sample rate:	
Accuracy of the heart rate monitor:	
Heart rate measuring range:	
Current speed display range:	
Water resistance:	Water proof IPX7 Protected against wash splashes and raindrops. Do not immerse the V650 in water. Using the V650 in excessive rainfall may cause interference on GPS reception.

V650 limit values

Maximum number of files:	
Maximum time recorded to one file:	99 h 59 min 59 s
Maximum time recorded to files with different sensor combinations:	
Maximum number of laps recorded in one training session:	
Maximum number of automatic laps recorded in one training session:	
Total distance:	
Total duration:	
Total calories:	
Total training files count:	

HEART RATE SENSOR

Battery life:	300 h
Battery type:	CR2025
Battery sealing ring:	O-ring 20.0 x 0.90 Material Silicone
Operating temperature:	-10 °C to +50 °C / 14 °F to 122 °F
Connector material:	ABS

Strap material:	38% Polyamide, 29% Polyurethane, 20% Elastane, 13% Polyester
Water resistance:	30 m

GUARANTEE AND DISCLAIMER

LIMITED INTERNATIONAL POLAR GUARANTEE

- This guarantee does not affect the consumer's statutory rights under applicable national or state laws in force, or the consumer's rights against the dealer arising from their sales/purchase contract.
- This limited Polar international guarantee is issued by Polar Electro Inc. for consumers who have purchased this product in the USA or Canada. This limited Polar international guarantee is issued by Polar Electro Oy for consumers who have purchased this product in other countries.
- Polar Electro Oy/Polar Electro Inc. guarantees the original consumer/purchaser of this device that the product will be free from defects in material or workmanship for two (2) years from the date of purchase.
- The receipt of the original purchase is your proof of purchase!
- The guarantee does not cover the battery, normal wear and tear, damage due to misuse, abuse, accidents or non-compliance with the precautions; improper maintenance, commercial use, cracked, broken or scratched cases/displays, armband, elastic strap and Polar apparel.
- The guarantee does not cover any damage/s, losses, costs or expenses, direct, indirect or incidental, consequential or special, arising out of, or related to the product.
- Items purchased second hand are not covered by the two (2) year warranty, unless otherwise stipulated by local law.
- During the guarantee period, the product will be either repaired or replaced at any of the authorized Polar Service Centers regardless of the country of purchase.

Guarantee with respect to any product will be limited to countries where the product has been initially marketed.

Polar Electro Oy is a ISO 9001:2008 certified company.

CE This product is compliant with Directives 1999/5/EC and 2011/65/EU. The relevant Declaration of Conformity is available at www.polar.com/support.

 This crossed out wheeled bin marking shows that Polar products are electronic devices and are in the scope of Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE) and batteries and accumulators used in products are in the scope of Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators. These products and batteries/accumulators inside Polar products should thus be disposed of separately in EU countries. Polar encourages you to minimize possible effects of waste on the environment and human health also outside the European Union by following local

waste disposal regulations and, where possible, utilize separate collection of electronic devices for products, and battery and accumulator collection for batteries and accumulators.

COMPLIANCE STATEMENT

CANADA

Polar Electro Oy has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

Polar Electro Oy n'a approué aucune modification apportée à l'appareil par l'utilisateur, quelle qu'en soit la nature. Tout changement ou toute modification peuvent annuler le droit d'utilisation de l'appareil par l'utilisateur.

Industry Canada (IC) regulatory information

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Avis de conformité à la réglementation d'Industrie Canada

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Class B digital device notice

This Class B digital apparatus complies with Canadian ICES-003, RSS-Gen and RSS-210.

Cet appareil numérique de la classe B est conforme à la norme NMB-003, CNR-Gen et CNR-210 du Canada.

USA

Polar Electro Oy has not approved any changes or modifications to this device by the user. Any changes or modifi cations could void the user's authority to operate the equipment.

FCC regulatory information

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency

energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/ TV technician for help.

This product emits radio frequency energy, but the radiated output power of this device is far below the FCC radio frequency exposure limits.

This equipment complies with FCC RF radiation exposure limits forth for an uncontrolled environment. Nevertheless, the device should be used in such a manner that the potential for human contact with the antenna during normal operation is minimized.

DISCLAIMER

• The material in this manual is for informational purposes only. The products it describes are subject to change without prior notice, due to the manufacturer's continuous development program.

• Polar Electro Inc./Polar Electro Oy makes no representations or warranties with respect to this manual or with respect to the products described herein.

• Polar Electro Inc./Polar Electro Oy shall not be liable for any damages, losses, costs or expenses, direct, indirect or incidental, consequential or special, arising out of, or related to the use of this material or the products described herein.