ErControl 3 Documentation

Document version 2

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Welcome to the ErControl 3 documentation.

> **Note**
>
> This manual is not yet complete and is continuously expanded.

1 Installation

This chapter describes how to install ErControl 3.

1.1 Requirements

- Windows 10 or 11
- An ergometer with a *serial interface*/USB port, *BLE FTMS* support, or *ANT+ FE-C* support
- For ANT+ (trainer or heart rate monitor), additionally: an ANT+ USB stick and the separately downloadable AntInterface archive (see below)

1.2 Installing via the setup

1. Download the current setup from the ErControl homepage.
2. Run the installer and follow the wizard.
3. Start ErControl 3 via the newly created Start menu icon.

1.3 Installing AntInterface (ANT+ only)

Only necessary if ANT+ hardware (trainer or heart rate monitor) will be used - this step is not needed for serial or BLE connections.

1. Download the AntInterface .7z archive from the ErControl homepage.
2. Extract it to any location.
3. Enter the path to `AntInterface.exe` under **Settings → ANT+ / AntInterface**.

2 Program Documentation

2.1 Starting Free Training

Here's how to start a free training session in ErControl 3:

1. Set up a training device in the **Devices** area and mark it active - *serial*, *ANT+ FE-C*, or *BLE FTMS*. Optionally also mark a heart rate monitor active.
2. In the main window, choose **Start Free Training**. ErControl then automatically tries to connect to the active training device (and any active heart rate monitor) using the configured connection type.
3. If no connection can be established, the connection dialog offers to continue with simulated data instead, or to cancel entirely.

During training, gear shifting, intensity, and map zoom can be controlled via the keyboard, see *Keyboard shortcuts during training*.

2.2 Training Overview

The training overview shows all past training sessions of the currently logged-in user and is opened via the entry of the same name in the navigation bar of the main window.

Layout

- Top left, a table listing all training sessions (newest first), with the fixed columns **Type**, **Start**, **Duration**, **Note**, and **Finished**.
- Bottom left, a chart for the currently selected training: for free training sessions as well as heart-rate and power profiles, the curves for heart rate, power, and cadence; for topographic profiles, the elevation profile of the route with the stage that was ridden instead.
- On the right, an optional detail panel with the values that are not currently shown as a table column (can be toggled with the **Details** button).

The **Columns** button lets you choose which further metrics are shown as table columns, including average and maximum values for heart rate, power, and cadence, distance, energy, fitness score, and, for topographic profiles, stage, ascent, descent, and total elevation. Column order and visibility are stored per user.

Actions

The following actions are available for the training selected in the table:

- **Continue** – continues a training session that has not yet finished. For a topographic profile with several stages, ErControl asks whether to start a new stage or continue the one last ridden, provided part of the profile has already been ridden.
- **Power profile** – creates a new power profile from the training's data.
- **Export (hrm)**, **Export (csv)**, **Export (Strava gpx)** – exports the selected training to the respective format.
- **Export (csv) all** – exports all displayed training sessions together as a single CSV file.
- **Delete** – permanently deletes the selected training after confirmation.

2.3 Profiles

Under **Profiles** you manage training profiles: topographic profiles (route), heart-rate profiles, and power profiles. The page is opened via the **Profiles** entry in the navigation bar of the main window, right below *Training Overview*.

Layout

- On the left, a tree of folders and profiles. The top-level entry **Profiles** represents the top level without a folder.
- On the right, for the selected profile, a name field plus metrics matching the profile type:
  - **Topographic**: length, elevation difference, ascent, descent.
  - **Heart-rate controlled**: duration plus target heart rate (min./max./average) in percent and beats.
  - **Power controlled**: duration plus target power (min./max./average) in watts.
- A chart shows the profile's curve (route profile, or heart-rate/power curve).
- For heart-rate and power profiles, additionally a points editor (a table with time and target-value columns) used to edit the curve manually. Topographic profiles have no points editor; they are created exclusively via GPX import.

A folder or profile is selected by clicking it in the tree; new folders/profiles are always placed at that location (shown as the tooltip "Location: …").

Actions

- **Start training** – starts a training session with the selected profile (the same training window as for Free Training, see *Starting Free Training*).
- **New Folder** – creates a new folder at the current placement location.
- **Heart-rate profile** / **Power profile** – creates a new, empty heart-rate or power profile, which you then fill with values via the points editor and apply with **Save** (**Cancel** discards unsaved changes).
- **GPX Import** – imports a GPX file as a new topographic profile.
- **Delete** – permanently deletes the selected profile, or the folder along with its contents, after confirmation. If a profile has already been ridden in a training session, it (and any folder containing it) is protected from deletion.

When you create a power profile from a training session in the *Training Overview*, you are automatically taken to this Profiles page afterwards.

2.4 Users

Under **Users** you manage the users set up in ErControl and their master data. The page is opened via the entry of the same name in the navigation bar of the main window, right below *Profiles*.

> **Note**
>
> This page is only for managing user data. Who is currently logged in (and whose trainings/profiles are shown in *Training Overview* and *Profiles*) is determined on the login screen at program start, not here.

Layout

- On the left, a list of all users.
- On the right, the master data of the selected user: user ID, last name, first name, date of birth, sex, weight, maximum heart rate, and starting power.
- A **Heart Rate Zones** field shows the ranges Light (60-70 %), Medium (70-80 %), and Hard (80-90 %) calculated from the maximum heart rate, in beats per minute; the values update automatically as soon as date of birth, sex, weight, or maximum heart rate are changed.

If no maximum heart rate is entered, ErControl suggests a value based on age, weight, and sex ("calculated: …"); **Apply** copies this suggestion into the maximum heart rate field.

Actions

- **New User** – creates a new user, who immediately appears in the list and can be edited.
- **Save** – applies changes to the selected user's master data.
- **Cancel** – discards unsaved changes.
- **Delete** – permanently deletes the selected user after confirmation. The currently logged-in user, as well as users who have already completed training sessions, cannot be deleted.

2.5 Gear Shifters

Under **Gear Shifters** you manage virtual gear shifters: named sets of gears that let you convert cadence into a simulated speed via the keyboard during a training session - similar to a real bicycle gearshift. The page is opened via the entry of the same name in the navigation bar of the main window, right below *Users*.

Two standard gear shifters (for bike and cross-trainer) are built in and cannot be edited or deleted.

Layout

- On the left, a list of all gear shifters (including the two standard gear shifters).
- On the right, the name of the selected gear shifter and the table of its **gears**: one value **Development (m)** per gear, i.e. the distance covered per pedal revolution. The position in the list corresponds to the gear number.

Actions

- **New Gear Shifter** – creates a new, empty gear shifter.
- **Add Gear** / **Delete Gear** – adds a gear to the selected gear shifter, or removes one.
- **Save** – applies changes to the name and gears.
- **Cancel** – discards unsaved changes.
- **Delete** – permanently deletes the selected gear shifter along with all its gears after confirmation. If the deleted gear shifter was set as a user's active gear shifter, the standard gear shifter is used again automatically for the next training session.

Use During Training

Which gear shifter is used during training is set under *Settings* on the Ergometer tab. The number of gears you can cycle through with Numpad +/- (see *Keyboard shortcuts during training*) exactly matches the number of gears stored here for the selected gear shifter.

Values of the Standard Gear Shifters

Both standard gear shifters have 14 gears. The tables show, for each gear, the development and the resulting speed at a cadence (TF) of 60 or 80 revolutions per minute.

Bike

Gear	Development (m)	Speed at TF 60/min	Speed at TF 80/min
1	1.80 m	6.5 km/h	8.6 km/h
2	2.04 m	7.3 km/h	9.8 km/h
3	2.32 m	8.4 km/h	11.1 km/h
4	2.65 m	9.5 km/h	12.7 km/h
5	2.99 m	10.8 km/h	14.4 km/h
6	3.41 m	12.3 km/h	16.4 km/h
7	3.87 m	13.9 km/h	18.6 km/h
8	4.40 m	15.8 km/h	21.1 km/h
9	4.99 m	18.0 km/h	24.0 km/h
10	5.69 m	20.5 km/h	27.3 km/h
11	6.45 m	23.2 km/h	31.0 km/h
12	7.32 m	26.4 km/h	35.1 km/h
13	8.34 m	30.0 km/h	40.0 km/h
14	9.47 m	34.1 km/h	45.5 km/h

Cross-Trainer

Gear	Development (m)	Speed at TF 60/min	Speed at TF 80/min
1	0.47 m	1.68 km/h	2.24 km/h
2	0.83 m	2.98 km/h	3.97 km/h
3	1.19 m	4.28 km/h	5.71 km/h
4	1.55 m	5.58 km/h	7.44 km/h
5	1.91 m	6.88 km/h	9.17 km/h
6	2.27 m	8.18 km/h	10.91 km/h
7	2.63 m	9.48 km/h	12.64 km/h
8	2.95 m	10.61 km/h	14.15 km/h
9	3.26 m	11.74 km/h	15.65 km/h
10	3.58 m	12.87 km/h	17.16 km/h
11	3.89 m	14.00 km/h	18.67 km/h
12	4.20 m	15.13 km/h	20.17 km/h
13	4.52 m	16.26 km/h	21.68 km/h
14	4.83 m	17.39 km/h	23.19 km/h

2.6 Devices

The devices area is reached via **Devices** in the main navigation and is split into two tabs: training devices and heart rate monitors. Applies only to the currently logged-in user.

Any number of named devices can be created per tab, but exactly one is marked **active** (star) - that's the device actually used when training starts. An active training device is required; an active heart rate monitor is optional.

Training devices

- List of created devices on the left, detail area on the right. Buttons **New**, **Save**, **Cancel**, **Delete**.
- **Name** of the device.
- **Connection type**: *serial*, *ANT+ FE-C*, or *BLE FTMS*. Depending on the selection, a matching section with a **Test** button appears:
  - **Serial**: select a COM port; Test connects over it on a trial basis.
  - **ANT+ FE-C**: choose the first device found or a fixed device number; Test connects accordingly via ANT+ on a trial basis.
  - **BLE FTMS**: choose the first device found or a specific device. If an address is already stored (or "first device found" is selected), Test connects directly; without a stored address, Test first opens a device selection (scan) - the device name is set this way, not typed freely ("Set by Test (scan), not freely editable"). A reset button undoes the device assignment.
- Star button per row: marks the device as active. The active device cannot be deleted.
- When the first device is created, it becomes active automatically.
- After updating from a previous version, no training device appears in this list yet - only when training is actually started for the first time is a device named "Migrated" automatically created from the previous settings (connection type, port or BLE address) and set active.

Heart rate monitors

Same layout as for training devices (list, detail area, New/Save/Cancel/Delete, star to activate).

- **Connection type**: *ANT+ HRM* or *BLE Heart-Rate-Service*.
  - **ANT+ HRM**: choose the first device found or a fixed device number. Test waits up to 12 seconds for the first heart rate reading - success shows the measured heart rate, otherwise a "no sensor found" notice.
  - **BLE Heart-Rate-Service**: same scan-or-direct behavior as BLE FTMS above, just against the heart rate service instead of FTMS.
- One difference from training devices: clicking an already-active heart rate monitor again **deactivates** it, instead of making another device active.
- An active heart rate monitor is optional - without one, the heart rate measured by the ergometer itself is used, provided the ergometer supports it.

Requirement for ANT+

The connection tests for ANT+ FE-C and ANT+ HRM require a valid path to `AntInterface.exe` to be set under **Settings → ANT+ / AntInterface → AntInterface (base)**. If that's missing, Test shows a corresponding error message.

2.7 Settings

The settings area is reached via **Settings** in the main navigation and is split into four tabs: Training, Ergometer, ANT+ / AntPowerBridge, and System. Changes only take effect once you click **Save**; **Cancel** discards them.

Training

Controls behavior during and after training. Applies only to the currently logged-in user.

- **Recovery heart rate**: When enabled, the recovery heart rate is automatically measured at the end of training (cadence = 0) and the fitness score is stored in the database.

- Turn automatic saving of training data on or off.

Ergometer

Hardware-level settings for the ergometer. Applies only to the currently logged-in user.

- **Maximum power** in watts.
- **Ergometer type**: bike or cross-trainer, plus the efficiency (16.7 %, 12.5 %, or custom).
- **Gear shifting**: automatic gear shifting with watt thresholds at which it shifts up or down.
- **Power control via PC only**: with gear shifting turned off, the gear-up/-down keys (Numpad +/-) directly adjust power in 5-watt steps instead of shifting gears. Intended for ergometers whose own buttons on the device stop responding once it has been controlled by the PC. Applies only to Free Training and the topographic profile, not to the power/heart-rate profile (there the profile dictates power anyway). See *Keyboard shortcuts during training* for all keyboard shortcuts during training.
- **Resistances**: physical parameters for the route simulation - rolling resistance coefficient (cr) and effective air drag (cw·A), with a reset button back to the default values.

ANT+ / AntInterface

Connects to the external `AntInterface.exe`.

AntInterface (base)

Establishes the ANT+ connection for trainers (FE-C) and heart rate monitors selected in the **Devices** area. It can also be used to forward power and cadence to another device (see below).

- Path to `AntInterface.exe` - it is started automatically when training starts, if a path has been set. Applies to all users on this PC.

The actual device pairing (which ANT+ or BLE trainer, fixed device number or first device found, connection test) is no longer here - that is now part of the **Devices** area.

Forward power/cadence

Additionally sends the training data as its own ANT+ sensor to another device, e.g. a Garmin watch.

- Checkbox **Enable ANT+** - applies only to the currently logged-in user.
- Device ID used for communication - applies to all users on this PC.

System

General program settings.

- Automatically check for new versions on program start (applies only to the currently logged-in user). **Note:** Only the setting exists so far - the actual version check is not yet implemented in the current ErControl 3 version.
- Set the log level and serial logging, open the log directory directly (applies to this Windows user account).

2.8 Keyboard shortcuts during training

During an active training session (Free Training, heart-rate/power profile, or topographic profile), individual functions can be controlled via the numeric keypad (Numpad). The keys work window-wide, regardless of which control currently has focus (e.g. even while the simulator slider is focused).

Always available

Key	Effect
Numpad 0	Turn gear shifting on/off. Has no effect with a heart-rate or power profile, since the profile already dictates power there.
Numpad +	With gear shifting active: shift up one gear. Otherwise, if **Power control via PC only** is enabled: increase power by 5 watts.
Numpad -	With gear shifting active: shift down one gear. Otherwise, if **Power control via PC only** is enabled: decrease power by 5 watts.
Numpad 9	Turn automatic gear shifting on/off. Only with a loaded profile (heart-rate, power, or topographic profile); has no effect in Free Training without a profile.

Gear shifting and power control via PC only are configured under **Settings → Ergometer**.

Depending on the training type

Numpad 1-3 and 4-6 carry different functions depending on the profile type:

Key	Free Training (no profile)	Heart-rate/power profile	Topographic profile
Numpad 1	no effect	Decrease intensity	Zoom map in
Numpad 2	no effect	Reset intensity	Reset map zoom
Numpad 3	no effect	Increase intensity	Zoom map out
Numpad 4	no effect	no effect	Shrink the elevation profile's zoom window (closer in)
Numpad 5	no effect	no effect	Show/hide marker icons in the elevation profile
Numpad 6	no effect	no effect	Enlarge the elevation profile's zoom window (further out)

- **Intensity** (Numpad 1-3 with heart-rate/power profile): factor between 0.1 and 2 in steps of 0.05, used to scale the target curve at runtime - affects the displayed target curve and the calculated target power or target heart rate. Not saved; applies only to the current training session.
- **Map zoom** (Numpad 1-3 with topographic profile): zoom level of the map view.
- **Elevation profile zoom window** (Numpad 4/6 with topographic profile): visible route section in the elevation profile chart, in steps from 200 m to 50 km.

> **Note**
>
> Free Training without a profile has neither a target curve nor an elevation profile - Numpad 1-6 have no effect there.

2.9 Tips & Troubleshooting

How realistic is riding with ErControl?

A good question, and not one with an easy answer. The philosophy behind ErControl's development is to make riding as realistic as possible - unlike, say, Kettler's original TourConcept software, which has a separate "realistic" setting for this: without it, riding uphill is definitely far too easy. ErControl deliberately has no equivalent setting.

That an average person can't ride a 200 km Tour de France stage in one go is probably obvious to everyone - and it would also spoil all the fun. That's exactly why such a mammoth profile can be ridden across several individual stages, see **Continue** in the *Training Overview*.

And if it's still too hard going uphill even in first gear, you can deactivate the gear shifter and set the power yourself - see the next point for that.

Riding uphill with the gear shifter – too hard even in first gear

In this case, you can deactivate the gear shifter via **Numpad 0** (see *Keyboard shortcuts during training*) and set the power yourself instead:

- Normally via the ergometer's own +/- buttons.
- If these stop responding once the ergometer has been controlled by the PC, the **PC-only power control** setting under *Settings* (Ergometer tab) helps - the Numpad +/- keys then take over power control in 5-watt steps.

Speed jumps when riding without the gear shifter

At the points in the profile where the gradient changes, the speed is also recalculated. ErControl models the inertia of the mass here, so the speed approaches the new gradient's value instead of adjusting abruptly - a visible jump at gradient changes can't be avoided completely, though.

> **Note**
>
> This doesn't apply with an active virtual gear shifter (see *Gear Shifters*): there, cadence determines the speed directly and without inertia, similar to a real bicycle gearshift.

The recovery pulse measurement is wrong

This can happen if the ergometer's own recovery pulse button was pressed. Please don't press that button. With recovery pulse measurement enabled (see *Settings*, Training tab), the measurement starts automatically at the end of the training session (cadence = 0).

Speed/distance covered doesn't match the ergometer's own data

That's because the ergometer determines speed solely from cadence. ErControl, on the other hand, calculates speed from the power (and the rider's weight).

3 Glossary

ANT+ FE-C
: ANT+ Fitness Equipment Control. A wireless protocol for fitness equipment, similar to *BLE FTMS*, but over ANT+ radio instead of Bluetooth.

ANT+ HRM
: ANT+ Heart Rate Monitor. Wireless protocol used by heart rate monitors (e.g. chest straps) to transmit heart rate via ANT+ - the heart-rate counterpart to *ANT+ FE-C*.

BLE FTMS
: Bluetooth Low Energy Fitness Machine Service. A Bluetooth standard used by fitness equipment (e.g. ergometers) to wirelessly transmit training data to a control app such as ErControl 3.

BLE Heart Rate Service
: Standard Bluetooth service used by heart rate monitors (e.g. chest straps) to transmit heart rate via Bluetooth Low Energy - the heart-rate counterpart to *BLE FTMS*.

Serial Interface
: Also called a COM port. Classic connection used by older Kettler ergometers to communicate with the PC - either via a genuine serial (RS-232) port or via a USB cable that presents itself to the PC as a virtual COM port.

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