

# LUDUS COMBAT SIMULATOR SYSTEM

CS- TRAINING



# USER MANUAL



LUDUS ALLIANCE

---

# Table of Contents

<b>Introduction</b> .....	<b>1</b>
Who is Ludus? .....	1
What is the CS-System? .....	1
What does the CS-System measure? .....	2
Health Warning .....	2
Proper Handling.....	3
<b>Getting to Know the Ludus Combat Simulator System (CS-S) 4</b>	
What does the Ludus Combat Simulator System (CS-S) consist of?.....	4
How does the Ludus Combat Simulator System (CS-S) Work?..	5
Android and iOS Requirements.....	5
Downloading the Ludus Coach and Warriors App .....	5
<b>CS-Paddle Set Up and Basics .....</b>	<b>6</b>
CS-Paddle Components .....	6
Handle.....	6
Safety Strap.....	7
Strike Area.....	7
Signal Lights .....	7
Touch Zone .....	7
Height Sensor.....	7
Charger Port .....	8
Reset Button .....	8
Control Panel and Screen.....	8
Charging and Starting Up the CS-Paddle .....	12
Registering and Syncing the CS-Paddle.....	13
Turning on Bluetooth (BLE) Mode .....	13
Coach Registration of the CS-Paddle.....	14
Uploading data from the CS-Paddle .....	14
<b>Wristband Basics .....</b>	<b>15</b>
Wristband Registration and Upgrade.....	16
Registering a Wristband .....	16
Wristband Sequences and Upgrading a Sequence .....	18
<b>Training Basics .....</b>	<b>18</b>

---

Connecting the CS-Paddle to a Wristband .....	18
Training Signal Lights .....	20
Training Modes.....	21
Freestyle .....	21
Time interval.....	21
Stamina.....	22
<b>Using the Ludus CS-Paddle without a Wristband .....</b>	<b>24</b>
<b>Support .....</b>	<b>24</b>
Troubleshooting.....	24
Do's and Don'ts .....	25
Contact Us.....	26
<b>Technical Specifications.....</b>	<b>26</b>
<b>Return Policy .....</b>	<b>27</b>

---

# Introduction

## Who is Ludus?

Ludus Materials Ltd is a hi-tech company that specializes in training and testing equipment for martial arts. Our technology enables the creation of objective measurements that could not be measured before.

Our goal is to provide innovative technology to the world and as a result, to unite all martial arts from around the globe.

We are the Ludus Alliance.

## What is the CS-System?



The Ludus Combat Simulator System (CS-System) is a unique training system that enables both coaches and athletes to objectively measure and analyse

various performance parameters of martial arts training.

## What does the CS-System measure?

### 1. **Response Time**

The time it takes an athlete to respond to stimuli.

### 2. **Decision Making**

The time it takes an athlete to respond to stimuli when given multiple options (fakes, strikes).

### 3. **Stamina**

The amount of time an athlete can sustain prolonged physical or mental effort.

### 4. **Power**

The power or strength of a punch or kick.

### 5. **Height**

### 6. **Number of Strikes**

### 7. **Number of Mistakes**

## Health Warning

- ✓ Before using Ludus Products, you should get a medical check-up.
- ✓ It is important that you warm up and stretch before each workout, and that you train responsibly.

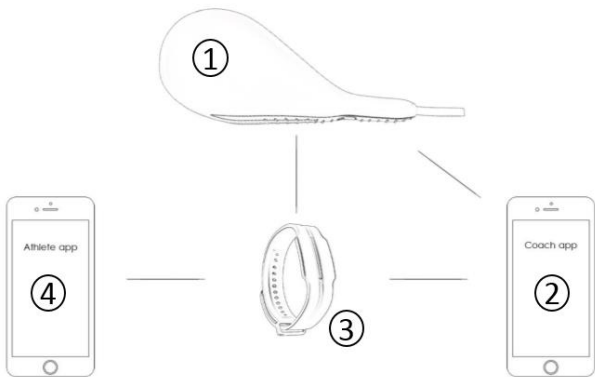
- ✓ If you experience any pain, feel weak, dizzy, or exhausted, or become short of breath, immediately stop your workout.
- ✓ When you work out, you assume all inherent risks.
- ✓ Not recommended during pregnancy.

## **Proper Handling**

- ✓ Training with the CS-Paddle should be supervised/operated by a qualified coach.
- ✓ Do not strike on or near, the CS-Paddle's Control Panel or Handle, as this can lead to injury or damage to the product.
- ✓ Always use the Products in a safe environment.
- ✓ Under the environment with electrostatic discharge, the sample may malfunction and need user reset to recover sometimes.
- ✓ Follow the usage instructions fully in order for the system to work properly.
- ✓ In the case that the CS-Paddle is opened/the internal components are exposed in any way, stop operation immediately and refer to Customer Support.

# Getting to Know the Ludus Combat Simulator System (CS-S)

What does the Ludus Combat Simulator System (CS-S) consist of?



The Ludus Combat Simulator System (CS-S) consists of:

1. Ludus CS-Paddle
2. Coach App
3. ID Wristband
4. Warriors App

## **How does the Ludus Combat Simulator System (CS-S) Work?**

The Ludus CS-S works by using the ID Wristband as a personal identifier for every athlete with the system. Before beginning training with the CS-S, the athlete connects their ID wristband to the CS-Paddle. At the end of the training, the athlete disconnects. The CS-Paddle then stores the data from the training according to the athlete and their wristband.

The coach then uploads the data from the CS-Paddle (i.e. syncs the CS-Paddle), allowing for both the Athlete and Coach to view the performance on the Coach and Warrior Apps.

## **Android and iOS Requirements**

Both the Ludus Coach and Warriors App run on Android 4.4 and above and iOS 9.0 and above.

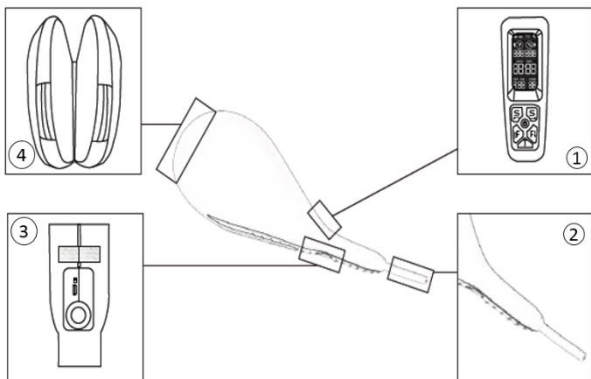
## **Downloading the Ludus Coach and Warriors App**

Both Warriors and Coach App can be downloaded from App Store and Google Play.



# CS-Paddle Set Up and Basics

## CS-Paddle Components



1. Control Panel
2. Handle with safety strap
3. Touch Zone and reset button
4. Signal lights

### Handle

The handle of the Ludus CS-Paddle is built using special technology that allows for high levels of shock absorption, reducing the impact received by the CS-Paddle Operator.

## Safety Strap

The safety strap attached to the handle prevents the CS-Paddle from falling during training.

## Strike Area

The soft surface of the Ludus CS-Paddle is the athlete's target area.

## Signal Lights

At each side of the Ludus CS-Paddle there are signal lights which flash in different colours, depending on the training exercise (any timed mode from beginning to end) or function being carried out. For further information, see [Training Signal Lights](#).

## Touch Zone

The Near Field Communication (NFC) 'Touch Zone' is marked by a red rectangle on the underside of the CS-Paddle. The Touch Zone allows the user to **touch in** with their Wristband in order to connect to the CS-Paddle. For further information see [Training Basics](#).

## Height Sensor

The **Height** sensor, on the underside of the handle, uses ultrasonic sensor technology to measure the height of each strike.

## Charger Port

The CS-Paddle is charged through the micro-USB charger port on the underside of the handle.

## Reset Button

The **Reset** button clears the CS-Paddle cache memory of current activity (period that begins when an athlete connects to the system, and ends when they disconnect) and restarts the system. It does not clear the data from the CS-Paddle.

## Control Panel and Screen

The [control panel](#) is where the Ludus CS-Paddle Operator can set a range of training exercises and see the status of their CS-Paddle.

## CS-Paddle Control Panel Components

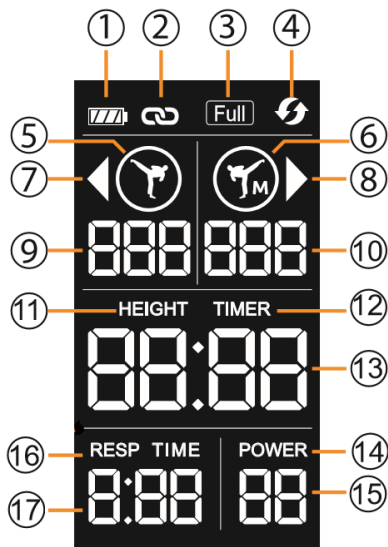


No.	Description
1	<b>Power/Clear.</b> Used to turn the CS-Paddle on and off, and to return to the <b>Home</b> screen during a training activity.
2	<b>T</b> button. Used for switching between exercise and connection modes.
3	<b>Strike Left/Left.</b> Used to activate the left strike signal on the CS-Paddle and for navigation / selection.
4	<b>Strike Right/Right.</b> Used to activate the right strike signal on the CS-Paddle and for navigation / selection.

No.	Description
5	<b>Fake Left/Up.</b> Used to activate the left fake signal on the CS-Paddle and for setting the timer.
6	<b>Fake Right/Down.</b> Used to activate the right fake signal on the CS-Paddle and for setting the timer.

For further information see [Training Basics](#).

### CS-Paddle Screen Components



<b>No.</b>	<b>Description</b>
1	Battery status indicator
2	<b>Wristband Connection</b> icon. Flashes when the CS-Paddle is in NFC mode and waiting for a Wristband to connect. Steady when connected.
3	<b>Memory Full</b> icon. When flashing during an activity, it indicates that the limit for the number of activities has been reached. When shown steadily, it indicates that the CS-Paddle memory is full.
4	<b>Connection</b> icon. Flashes when waiting for Bluetooth connection. Steady when connected.
5	<b>Time Interval Icon.</b> Flashes during selection of Time Interval Mode.
6	<b>Stamina Icon.</b> Flashes during selection of Stamina Mode.
6*	<b>Fake Icon.</b> Displayed when an athlete responds to Fake signals activated by the operator.
7, 8	<b>Left</b> and <b>Right</b> arrows displayed during timer and mode configuration. The arrows indicate which side the strike was received on.
9	Strike Counter (positioned under <b>Time Interval Icon</b> )

No.	Description
10	Fake-Mistake Counter (positioned under <b>Fake Icon</b> )
11	<b>Height.</b> Shown only during freestyle mode
12	<b>Timer.</b> Used only during timed modes
13	<b>Height and Time</b> indicator.
14	<b>Power</b>
15	<b>Power Indicator.</b> Displays power levels 1-7; 1 being the weakest and 7 - the strongest.
16	<b>Response Time</b>
17	<b>Response Time Indicator.</b> Displays the measured response time (up to 3 seconds).

## Charging and Starting Up the CS-Paddle

Before using the Ludus CS-Paddle, make sure it is sufficiently charged. To charge the CS-Paddle, insert a micro USB cable into the charging port.

- ✓ Use a standard USB-to-Micro USB cable and connect it to the USB port on a computer or a USB wall charger.
- ✓ The 4 bars within the battery icon on the CS-Paddle screen will light up and flicker, indicating that the CS-Paddle is charging. It should take 3-4 hours to completely charge the battery (at which point all 4 bars will be steadily lit).

- ✓ Do not attempt to operate your Ludus CS-Paddle while it is being charged.

**Important:**

In case of empty battery, charge the CS-Paddle and sync your data before starting a new activity to assure accurate and complete data synchronization.

## Registering and Syncing the CS-Paddle

### Turning on Bluetooth (BLE) Mode

In order to register your CS-Paddle or sync data, you must first set it to Bluetooth (BLE) mode as follows:

1. Ensure the Ludus CS-Paddle is set to the **Home** screen.
2. Press and hold the **T** button for at least 3 seconds.
3. Press the **Left** button to select **BLE** mode. The screen will read **BLE** and the connection icon will start blinking letting you know the Ludus CS-Paddle is in BLE (connection) mode. Once the connection is established the connection icon will display steadily.



## Coach Registration of the CS-Paddle

Before you can begin syncing data from the CS-Paddle, it must be registered to your Ludus Coach App account as follows:

1. Set the Ludus CS-Paddle to BLE mode (see [Turning on Bluetooth \(BLE\) Mode](#)).
2. Ensure that the Bluetooth on your Smartphone is active, and the phone is connected to the internet.
3. On the navigation panel of your Ludus Coach App, tap **Inventory** and select the **CS-Paddles** tab.
4. Under **CS-Paddles**, tap **+**. The App will display a list of all CS-Paddles in range with BLE Mode activated, which you have not yet registered to your account.
5. Select the CS-Paddle you wish to register. Once you have successfully registered it, a “Registration Successful” message will appear.
6. Register additional Ludus CS-Paddles, if necessary.

## Uploading data from the CS-Paddle

To sync the data from your CS-Paddle:

1. Set the CS-Paddle to BLE mode (see [Turning on Bluetooth \(BLE\) Mode](#)).

2. Ensure that the Bluetooth on your Smartphone is active, and the phone is connected to the internet.
3. On the navigation panel of your Ludus Coach App, tap **Inventory** and select the **CS-Paddles** tab.
4. Select the CS-Paddle whose data you wish to upload then tap **Sync**. The sync progress bar will appear. Once finished, you will receive a “Sync Successful” message and be returned to the CS-Paddles Screen.

**Notes:**

- Sync time may vary according to the amount of data you wish to upload
- You may need to perform the sync multiple times on the same CS-Paddle in order to complete a full data sync.
- If the sync process stops in the middle due to connection issues (CS-Paddle runs out of battery, or out of range), recharge the CS-Paddle and/or press the **Clear** button then sync again.

## Wristband Basics

The Wristband is the central element of the Ludus Combat Simulator System. It acts as the athlete’s personal identifier and when connected (touched in)

to the CS-Paddle, it immediately identifies the athlete and saves their data accordingly.

The Wristband allows for the personalized experience for every athlete.

**Note:** | In order so the Wristband will not fall during training, ensure that the Wristband is securely fastened on the wrist with the closing pin.

## Wristband Registration and Upgrade

### Registering a Wristband

In order for a Wristband to become valid and for an athlete to begin training, the Wristband must be registered. Once registered, the Wristband can be connected to the CS-Paddle and the data can then be collected.

When an athlete receives a new rank, they will need to upgrade their Wristband. This will create a sequence of Wristbands (see [Wristband Sequences and Upgrading a Sequence](#) for further explanation).

**Note:** | Wristbands must be registered by the Coach before they are registered by the Athlete. This creates the connection between the two and allows for both the Coach and Athlete to access the data.

## Coach

1. On the navigation panel of your Ludus Coach App, tap **Inventory** and select the **Wristbands** tab.
2. Tap **+**. The barcode scanner screen will open.
3. Scan the barcode connected to the tag on your Wristband. After a successful registration, a message “Registration Successful” will be displayed.
4. Register additional Wristbands if necessary.

## Athlete

1. On the navigation panel of your Ludus Warriors App, tap **My Account** and select the **My Wristbands** tab.
2. Tap **+**. The barcode scanner screen will open.
3. Scan the barcode connected to the tag on your Wristband. After a successful registration, a message “Registration Successful” will be displayed.
4. Select a name for your Wristband and tap **Save Wristband** to complete registration.

**Note:** | If the barcode scanner fails to read the barcode, tap **Manual** in the top-right corner of the screen to manually input the Wristband ID number.

## Wristband Sequences and Upgrading a Sequence

When an athlete receives a new Wristband from the same coach for whatever reason (getting a new rank, damaging or losing a previous Wristband), the athlete will need to “upgrade” their Wristband. This is known as “creating a sequence”.

The Ludus Apps makes the upgrading process fast and simple, by automatically identifying pre-existing Coach connections. If the athlete already has a Wristband registered with the same coach, the Ludus System will identify and upgrade it.

**Note:** | You will be able to see the data from every Wristband within the sequence, including the previously used ones.

## Training Basics

### Connecting the CS-Paddle to a Wristband

In order to open an activity and begin a training exercise, the Athlete’s wristband must be connected to the CS-Paddle.

The act of connecting your wristband is referred to as **Touching in**, while disconnecting to end the current activity is referred to as **Touching out**.

To connect/disconnect the CS-Paddle to/from a Wristband:

<b>Step</b>	<b>Operator</b>	<b>Description</b>
1	Coach	Navigate to CS-Paddle <b>Home</b> screen
2	Coach	Press and hold the <b>T</b> button for at least 3 seconds.
3	Coach	Press the <b>Right</b> button to enter Touch (NFC) mode.
4	Athlete	Touch the <a href="#">Touch Zone</a> with the Wristband. A connection icon will appear on the Control Panel and green signal lights will flash twice, letting both the Coach and Athlete know that the CS-Paddle is now connected to the Wristband.
5	Coach	At the end of an activity, return to the Home screen and press and hold the <b>T</b> button for at least 3 seconds to finish the activity and save the data. The connection icon will disappear, and the blue signal lights will flash twice.

**Notes:** | ✓ Only one Athlete can be touched in at a time

- ✓ During an activity, the Connected Athlete can perform multiple exercises.
- ✓ A maximum of 500 strikes per activity is permitted. In case you reach this limit, the activity will be closed automatically. The text **FULL** will appear in place of the timer.
- ✓ Up to 500 activities can be saved on the CS-Paddle at a time. If you reach this limit, the memory limit **FULL** indicator will be displayed on the CS-Paddle screen. Sync your CS-Paddle in order to save more data.

## Training Signal Lights

The Ludus CS-Paddle has three training light signals – **Strike**, **Fake**, and **Stamina**.

These are represented by three different colours:

- ✓ **Green (Strike)** signals the Athlete to strike the target area on the side of which the signal light appeared. The strike must occur within three seconds to be counted.
- ✓ **Blue (Fake)** signals the Athlete **not** to strike the target area. If they do, this will be counted as a mistake.

A fake is valid for two seconds; however, it can

be overridden with a Fake-to-Strike command, if one of the Strike buttons is pressed within a two-second timeframe. Using Fake and Fake-to-Strike commands helps to keep the Athlete to remain alert at all times.

- ✓ **Purple (Stamina)** signals the Athlete to strike the CS-Paddle as many times as possible during the selected time period.

## Training Modes

The CS-Paddle operates in three modes:

- [Freestyle](#)
- [Time Interval](#)
- [Stamina](#)

### Freestyle

There are no time restrictions in freestyle mode and both **Strike** and **Fake** signals can be used.

### Time interval

Time interval mode lets the CS-Paddle Operator set a timeframe for the athlete's exercise. In this mode, both **Strike** and **Fake** signals can be activated.

To begin a **Time Interval** exercise:

1. Press the **T** button, to reach the selection screen. The **Time Interval** and **Stamina** icons will be displayed.



2. Press the **Left** button to select **Time Interval** mode.
3. Press the **Left** button to set minutes.
4. Press the **Right** button to set seconds.
5. Use the **Up** and **Down** buttons to increase or decrease the number of minutes or seconds.
6. Once you have input the required time, press the **T** button.
7. To begin the exercise, press the **T** button again. In the final 5 seconds of the exercise, the timer on the CS-Paddle will begin flashing, to alert the operator.  
At the end of the exercise both signal lights will flash red.

## **Stamina**

Stamina mode is also time-restricted. The CS-Paddle Operator can set a specific time on the control panel (e.g. 2 minutes, 5 minutes) for an exercise.

The connected athlete must then strike the CS-Paddle as many times as possible during the selected time period.

To begin a **Stamina** exercise:

1. Press the **T** button, to reach the selection screen. The **Time Interval** and **Stamina** icons will be displayed.

2. Press the **Right** button to select **Stamina** exercise.
3. Press the **Left** button to set minutes.
4. Press the **Right** button to set seconds.
5. Use the **Up** and **Down** buttons to increase or decrease the number of minutes or seconds.
6. Once you have input the required time, press the **T** button.
7. Press either the **Strike Left** or **Strike Right** button to select which side the stamina exercise will be performed on.
8. Press the **T** button to begin the exercise.
9. Once the **Stamina** exercise has begun, a purple light will appear on the selected side of the CS-Paddle. This will remain lit throughout the entire exercise time.
10. In the final 10 seconds of the exercise, the purple light will begin flashing, to let the athlete know the exercise is almost over. In the final 5 seconds of the exercise, the timer on the Ludus CS-Paddle will begin flashing, letting the operator know that time is almost up.
11. At the end of the exercise, both signal lights will flash red.

# Using the Ludus CS-Paddle without a Wristband

Athletes can train in all the above modes without using a Wristband, however, no data will be saved.

## Support

### Troubleshooting

It is considered a malfunction if any of the below cases occur:

- ✓ The signal lights do not turn off or on
- ✓ The timer does not start
- ✓ Height is not displayed
- ✓ Power is not shown (not relevant in **Stamina** mode)
- ✓ The strike counter does not respond to strikes
- ✓ Data sync does not work

If any of the above occur, do the following in the order shown below, until the malfunction ceases:

1. Press the **Clear** button on the Control Panel.
2. Turn the CS-Paddle off and on and retry the attempted activity.
3. If the situation does not change, press and hold the **Reset** button on the underside of the CS-Paddle until the CS-Paddle screen turns off.

If the above troubleshooting solutions do not solve the problem, refer to Customer Support immediately.

## Do's and Don'ts

For your experience with the Ludus Combat Simulator System (CS-S) to be as smooth as possible, it is important to adhere to the following guidelines:

- ✓ Do not attempt operate the CS-Paddle when it is connected to a power outlet.
- ✓ Charge the CS-Paddle for at least three to four hours before heavy use.
- ✓ Do not hold the CS-Paddle along or against the body.
- ✓ Do not press any buttons that are not relevant to/during a specific situation – it can cause problems including invalid data
- ✓ To use the full functionality of your app including data sync and reports, ensure you have a continuous internet connection.
- ✓ Do not press more than one button on the CS-Paddle control panel at a time.
- ✓ Do not strike on or near the Control Panel or Handle, as this can lead to injury or damage to the product.
- ✓ Do not submerge the CS-Paddle, or part of it, in water.

- ✓ In order to get an accurate height measurement, ensure that you:
  - ✓ Hold the CS-Paddle parallel to the ground.
  - ✓ Do not cover the height sensor.

## Contact Us

For any questions or queries, please call us on +998.977773368.

Our telephone lines are open from 8 am to 8 pm EST. Alternatively, you can email us at [info@ludus-materials.com](mailto:info@ludus-materials.com)

We aim to reply to emails within 2 working days of receipt.

Our website: [www.ludusalliance.com](http://www.ludusalliance.com)

## Technical Specifications

The Ludus CS-Paddle captures and measures the most relevant parameters of martial arts training, such as (but not limited to) power, response time, and height for every strike.

The CS-Paddle incorporates various sensors and technology including:

- ✓ Ultrasonic Sensor (Height)
- ✓ Accelerometer 400G 3-AXIS Support (Strike detector and power indicator)

- ✓ Near Field Communications (NFC) used for identifying users
- ✓ Side Emitting LED Light Pipe indicators
- ✓ BLE - Bluetooth (Data transfer and registration)

## **Return Policy**

Ludus Materials Ltd. (“Ludus”) offers a 14-day money back guarantee on its wristbands (the “Wristbands”) and paddle (the “CS-Paddle”, and together with the Wristbands—the “Products”), provided that:

- (i) the Products were not damaged;
- (ii) the Products were not used;
- (iii) the Products are in its original packaging and
- (iv) you provide us with the original receipt, evidencing the purchase.