

Instructions

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Please read the quick start guide for an annotated description of all of the systems, features and an explanation of how to get started fencing.

Please read and retain these instructions for future reference.

Wireless Essentials

- To turn the base station on, press the power button[A] on the left hand side of the face.
- To start fencing you need a fencer pack synchronised to each side of the base station.
- There is a 2 stage detection and synchronisation process, when a pack (or any item) is within the required distance from the antenna [B], the light [F] will show yellow to signify that the base station is attempting to synchronise with a pack, if a pack that is switched on is being held close to the antenna then it will show blue to signify that it is synchronising, once complete the light on the side of the base station that you are holding the pack over will show solid green. This indicates that the pack is synchronised to this side of the piste/box.
- Once a pack is synced to a base station each time the two units are turned on the pack will automatically link to the base station and bring on the green link light. You do not need to re sync your packs each time you fence.
- If you don't have a pack linked to each side of the base station you can't start fencing.
- Ensure that the fencer pack is placed in your pocket with the antenna logo facing outwards. This is essential to maintain a proper connection. The pack must be close to your body in a snug pocket, not loose, for example in a side pocket of tracksuit trousers. **If there is more than 1cm** between the pack and your body then the system may not work correctly.
- Select your weapon using the button [C] on the right hand side of face of the box.
- You then need to select if you are using a metal piste or not using the button [J] on the side of the base station. Press the button for a few seconds to switch between piste mode on (small green light on [K]) and off (small green light off). It is important that the piste mode is set correctly for your use.
- For Foil and Epee you will need to calibrate the system before you fence. You must do this each time you change a fencer or a piece of fencing equipment. In foil and epee mode as soon as the base station detects any hit the blue lights will come on until you have calibrated.
- To calibrate you must be in your full fencing equipment and wearing your mask and glove ready to fence. Neither fencer must be holding their blade with their non-fencing hand or touching their weapon to their lame. In Foil mode, you need to come en garde and hit your opponents target area twice times. Each fencer needs to do this in turn (2 hits then 2 hits). For epee come en garde and instead of hits to the target you need to do hits to the opponents guard. Once calibrated the blue light will go out and you are then ready to fence.

- You must recalibrate each time there is a change of fencer or in equipment. To recalibrate **you need to turn off any one** of the three pieces of kit momentarily. Switching one of the fencer packs off is the easiest way to tell the system to recalibrate. With a bit of practice you can do this without removing it from your pocket. It will then initiate a calibration before you start fencing again.
- Do not depress the tip in Foil or Epee with your non fencing hand or let another person or your opponent press the tip with their bare hand. **Hit registration on bare skin will not be reliable and it may upset the calibration.**
- Always test **ONLY** on the floor, your foot or your opponents target area. You may get a coloured light, white light or no light when you hit bare skin, this does not mean the system is faulty.
- When testing do not hold your weapon with you non fencing hand, allow your opponent to hold your weapon with their non-fencing hand or allow a third person such as the referee to hold your weapon. **Holding the blade will interfere with the proper registration of hits and may upset the calibration.**

Hardware and controls

Base station front face



A) Power switch and battery level indicator

Press to turn on

Red flashing	Less than 10% left
Red	Less than 30% left
Orange	Less than 50% left
Green	more than 50% left

We recommend that you do not charge the base station until you are down to 10% battery. This will help maintain the life of the battery.

B) Volume button

Press to cycle between mute, low, medium and high.

C) Weapon select

Press to toggle between weapons.

D) Proximity sensor and Link Light Left hand side

The proximity sensor detects packs that are held close to the side of the antenna. They then link to each other and the green link light should come on.

E) Proximity sensor and Link Light Right hand side

As above but for the fencer on the Right hand side of the piste.

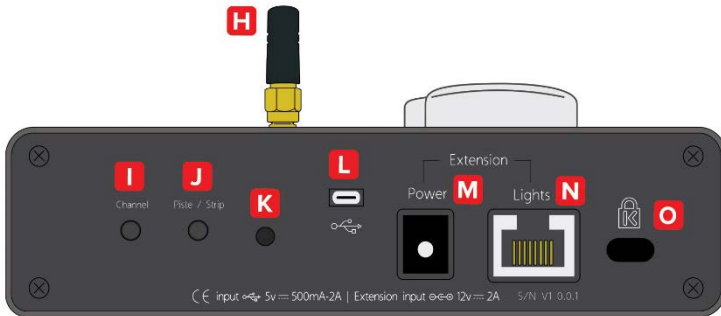
F) Hit indicator

This is the main hit indication lamp but will also show a yellow light when an object is in proximity to the antenna and a blue light when a pack has successfully synced to the base station

G) Amber blocking lamp

This will light amber when a fencer touches their lame with their own weapon.

Side panel



H) Antenna

This will be screwed when you receive the base. If you ever have to remove, ensure that it is finger tight when you replace it.

I) Channel select

This is only needed if there is interference and your system is behaving erratically. Press and hold the button to skip to the next radio channel.

J) Piste / strip select

Switch on piste detection when fencing on a metal piste and turn off when fencing on a normal floor.

K) Green LED piste indicator

Lit green when piste detection is on and off when it is off.

L) Micro USB power in

This accepts a standard micro USB 5v charger and is compatible with most phone and tablet chargers.

M) Power input for extension lights

If you want to use external extension lights you will need a power adapter which is available separately.

N) Extension light output

This will output the lights from the base station to external repeaters.

O) Kensington lock slot

This allows you to use a standard Kensington laptop lock to secure your base station against casual theft. Note, this side panel can be unscrewed so the lock will not deter a determined thief.

Fencer pack



A) Power switch with integral LED

The LED will light when the pack is turned on provided it is charged. We recommend you only charge the fencer pack when it gets to flashing red at which point you should still have several hours of fencing time left.

Red flashing	Less than 10% left
Red	Less than 30% left
Green	more than 30% left

B) Bodywire socket

Plug your bodywire in here just as you would normally plug it in to your spool.

C) Antenna side

IMPORTANT, you must always have the antenna side of the fencer pack facing away from your body and the other side with the Leon Paul logo not more than 10mm from your body. The best way to ensure this is to place it in the back pocket of your breeches with the Leon Paul logo facing towards you and the antenna logo facing away.

D) Micro USB power socket This accepts a standard micro USB 5v charger and is compatible with most phone and tablet chargers.

Detailed breakdown of functions

Radio link and sync process

How to sync packs to the base station

The fence packs have to be synchronised to the base station before use.

To sync a pack turn it on using the switch next to the three pin bodywire socket and with the base station also turned on lower it towards one side of the antenna on the base station. The base station will detect the pack and a yellow light will come on. The pack will then sync to the base station which can take up to 10 seconds. Once synced the yellow light will turn blue.

The green link light on the base station will then come on and remain on while the two units are connected. Once synced the pack will remain synced to that base station even if the power is turned off and will re connect again when both units are turned on again. **You do not need to sync the packs to the base station each time you fence.** If another pack is synced to the same side of the base station it will remove the previous pack.

Radio channel

Please note; you do not need to change radio channel unless you are having problems with the system. Wireless fencing works on the same free to use 2.4Ghz as most other wireless devices such as Wi-Fi routers and Bluetooth devices. This means that the system can be used without a licence anywhere globally. The system has a total of 16 possible channels but many sets of wireless fencing equipment can be used on a single channel. You should see no loss of performance with 20 or more sets all working on the same channel.

If your system seems to be working erratically then it might be due to interference on the radio channel that the set is using. To cycle through channels press and hold the channel button; the channel indicator lamp will then move through the channels and when it gets to 16 will go back to channel 1. All sets will come on channel 1 when they are new, to check what channel you are on press the channel button on the right hand side of the base station, channel one is indicated by the small amber blocking light which is below the main hit lamp on the left hand side of the base station. Channels are indicated as follows:

Channel	Indicator lamp	Channel	Indicator lamp
1	Amber LHS	9	Green link LHS
2	Red battery	10	Green Link RHS
3	Orange battery	11	Green hit LHS
4	Green battery	12	Green hit LHS + Amber LHS
5	Red foil	13	Green hit LHS + Red battery
6	Orange epee	14	Green hit LHS + Orange battery
7	Green sabre	15	Green hit LHS + Green battery
8	Amber RHS	16	Green hit LHS + Red foil

Top tip: If all of your base stations are set to the same channel then it will make the process of synchronising a fencer pack to a base station much faster. When you try to sync a pack to a base station it first looks on its last known channel and after that starts searching through the other 15 channels. Thus if all of your base stations are set to the same channel then the sync process if you move from one piste to the next will be almost instantaneous. If the base station has to search through all of the other channels than the process can take 5 – 10 seconds. We would therefore recommend that you keep all of your base stations on the same channel unless you have more than 20 sets.

Fencing

Pack location and orientation

The fencer pack must be worn with the antenna logo facing outwards. This is to prevent radio interference as the aerial is located on that side. It is necessary for the pack to be worn close to the body making the back pocket of breeches ideal. A fencer pack in loose fitting tracksuit trousers or very baggy breeches **will not work correctly**. If your pocket is too small or you are wearing breeches without a pocket, packs with a clip are available to attach the pack to your waistband.

Calibration

Calibration is needed for all foil and epee fencing.

Top Tip: It is essential that you re-calibrate the system each time you change either a fencer or a piece of equipment such as a bodywire or weapon. The quickest way to get the system to re-calibrate is to switch one of the fencer packs off and on again. With practice you can do this without even removing the pack from your pocket.

When you turn on the system and link two fencer packs, as soon as any hit is detected the main lights will go blue to show that you need to calibrate the system. It is essential at this point that you only do proper calibration hits which are to the target in foil and the guard in epee. You must be in your full fencing equipment including wearing your mask and glove. You must not . We suggest that you do this as the last thing before you start to fence. You must not hit anything else at this point especially pressing the tip with your bare non fencing hand or you will give the system incorrect calibration data. The system should calibrate after the 2nd hit and the blue light should go out on the side that has successfully calibrated.

If you have a faulty weapon then it may not be possible to get valid calibration data. You can tell if you have a faulty weapon because it will take more than the normal two hits to calibrate. After a total of 6 hits from a faulty weapon the system will use default calibration numbers and the calibration light will go out. You will still be able to fence but the system may be unreliable.

Piste detection

It is important that you select the appropriate mode because fencing on a piste with detection turned off or not fencing on a metal piste with it turned on will reduce the system's reliability. Press the button on the side of the unit so the **green** piste light is on to turn on piste detection, when the **green** piste light is turned off the piste detection is disabled.

*Top Tip: If you become very sweaty then it can become difficult to correctly distinguish the different types of hit. For epee we recommend regularly washing your glove to remove salt build up. If you are wet through then in the same way that a **wired** system can become unreliable and indicate hits on your whites the wireless system can become unreliable in the same way. Just as is the case in wired fencing; you must be reasonably dry and have clean equipment in good working order for wireless fencing to work correctly.*

Testing

Wireless fencing is fundamentally different to wired fencing so some things that happen with a wired setup may not happen in the same way with this wireless system. Things that may operate differently in wireless fencing include:

- In foil hitting your own hand can bring up a coloured light rather than a white light. This is the same effect as happens in normal wired epee and it is not considered a problem. The solution to this is to not hit your own hand or if you really want to make sure it doesn't happen then wear a glove on your non fencing hand.
- Holding your weapon in your non-fencing hand, holding your opponents weapon in your non-fencing hand or getting a third person such as the referee to hold the weapon disrupts the measurements needed for wireless fencing and may prevent proper signalling of hits.

If you want to test that the system is working please do a normal fencing action, a hit to target, off target, piste or floor.

Charging and power

When fully charged the base station should last for around 50 hours of fencing and the fencer packs should last for around 35 hours.

Both the base station and fencer packs can be charged from any standard micro USB charger, you should be able to use most mobile phone or tablet chargers and you can even charge them directly from a computer's powered USB port.

Due to the high capacity batteries they are best left to charge fully overnight, however; if you need a quick top up, every 1 minute of charge should give around 4 minutes of use.

We recommend that you allow the battery level to drop to the level where the red light is flashing before charging as this will maximise the lifespan of the battery.

Base station battery

Green	100 - 50%
Orange	49 - 30%
Red	29 - 10%
Flashing red	<10%

The micro USB socket is on the right hand side of the base station. When charging the red battery indicator will flash red and when fully charged the green indicator will turn on.

Fencer pack battery

The light on the switch will show the charge level when the pack is turned on. Green will be lit when the charge level is more than 30%, below 30% it will be red and below 10% it will flash red. You should still have at least a few hours fencing time after the pack starts to flash red. The micro USB socket is on the base of the fencer pack. When charging, the light will flash red until the battery is fully charged, then it will turn green.

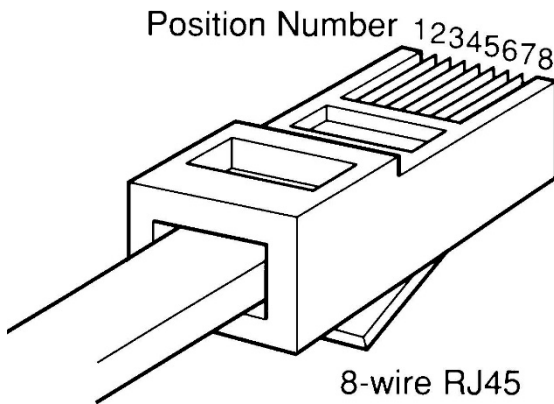
Extension / repeater lights

To power extension lights from the base station you will need a separate power supply plugged in to the side of the base station. This is a 12v 2A supply that can be purchased separately. The repeater light output is designed to drive Leon Paul tower lights or fencing technologies repeater lights that are commonly used in many fixed fencing salle installations. With appropriate adapters it will also drive some other extension lights. Because there are no industry standard specifications for repeater light control different manufacturers of repeater lights have used different inputs over the years. Leon Paul are not able to determine whether the output of our

system can control the input of a third party's repeater lights. You will have to consult the manufacturer of the repeater lights or a qualified electrician.

Please note this is not a data communication port. Do not attempt to plug it into a switch, router, computer or any other device.

RJ45 socket outputs:



Pin	Output
1	Green
2	Red
3	White (green side)
4	White (red side)
5	Yellow (green side)
6	Yellow (red side)
7	+12v
8	+12v

Troubleshooting

One side will not calibrate	Are two packs turned on and linked to the base station? You should have a green link light on both sides of the antenna on the base station.
Calibration takes more than three hits	Your weapon or bodywire are faulty and have high resistance. After 6 hits the base station will use default calibration numbers and you will be able to fence but the system may be unreliable. Check your weapon and bodywire to look for high resistance.
In foil hitting my bare hand brings on a coloured light	This is normal with this wireless system. If you want to prevent it then you can wear a glove on your rear hand.

Technical details

Base station	
Dimensions L/D/H	170mm/130mm/65mm (to top of antenna) 6.5in/5in/2.5in
Weight	539g 1lb 3oz
Battery	5200mAh 3.7v
Battery life	50 hours
Power	Micro usb 5v 500mA
Fencer Pack	
Dimensions L/D/H	125mm/80mm/35mm 5in/3 1/4in/1 1/4in
Weight	160g 5.6oz
Battery	3200mAh 3.7v
Battery life	35 hours
Power	Micro usb 5v 500mA
Set in a bag	
Dimensions L/D/H	190mm/190mm/75mm 7.5in/7.5in/3in
Weight	1083g 2lbs 6 oz
General	
Radio Frequency	2.4ghz ism band IEEE 802.15.4
Protocol	Proprietary encrypted