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KINVENT SENSORS

User manual



K-Sensors User Manual

K-Grip



K-Bubble



K-Push



K-Pull



K-Force Plates



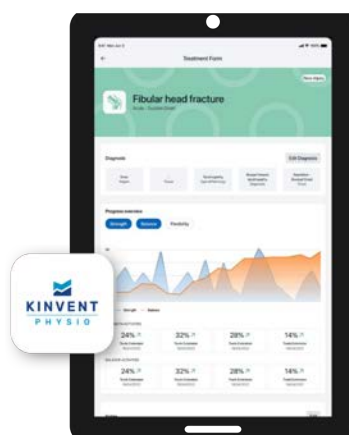
K-Deltas



K-Move

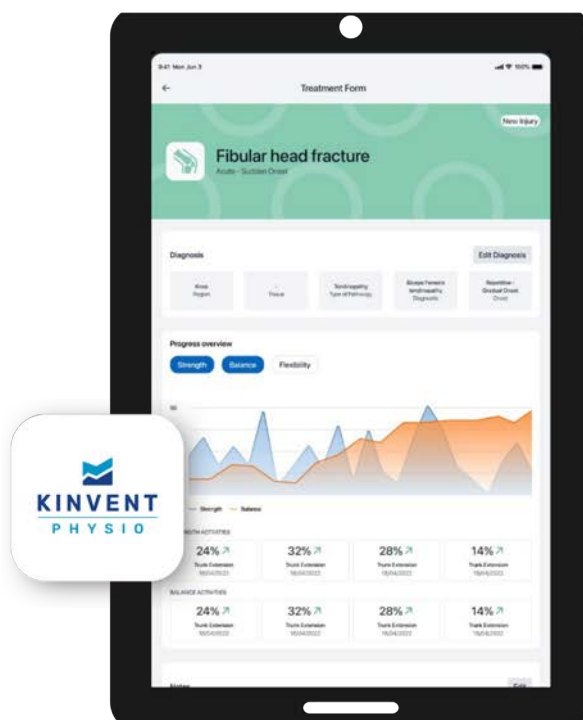


K-Deltas XL



K-Physio app

Kinvent Physio is the only app you will need for all your Kinvent Sensors. All tutorials for the invent Physio app are available online at: [Kinvent.link/quickstart](https://kinvent.link/quickstart)



This manual concerns K-SENSORS products. The information content of this manual belongs to KINVENT, and is provided only for the purpose of operating K-SENSORS and software. This manual is subject to modifications. The latest version is available on www.k-invent.com .

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Graphic Symbol

| | |
|--|--|
| | The sensors comply with electromagnetic regulations as laid out by the Federal Communications Commission. |
| | European Conformity MDR 2017/ 745 |
| | IEC 60878 Direct Current IN |
| | Recyclable Packaging Box |
| | Keep Dry |
| | sensor is provided nonsterile |
| | Attention, See Instructions for use |
| | Type B applied part - External Body only |
| | Serial Number |
| | Manufacturer |
| | sensor will not work when connected to AC outlet |
| | Class II Electrical Equipment |
| | An ISO 15223 symbol Indicating upper & lower temperature limits for operation, transport, and storage |
| | Nonionizing radiation |
| | Do not dispose of the units in normal household waste. Dispose products in accordance with local regulations |

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Introduction

Thank you for purchasing a K-Sensor.

K-SENSORS is the product line developed by KINVENT to objectively quantify rehabilitation. The product line of K-SENSORS is the complete tool designed for assessing, monitoring and exercising balance, strength, and joint motion. It consists of 7 sensors, all of them equipped with high precision measuring systems and with the KINVENT's excellence in interface development, mechanics and electronics.

K-Sensors series is composed of:

K-Grip



for the measurement of hand grip strength

K-Bubble



for the rehabilitation with biofeedback by the way of inflatable tools

K-Push



the handheld muscle dynamometer

K-Pull



for the strength measurement regardless of the operator

K-Force Plates



for the measurement of lower limb strength as well as balance

K-Deltas

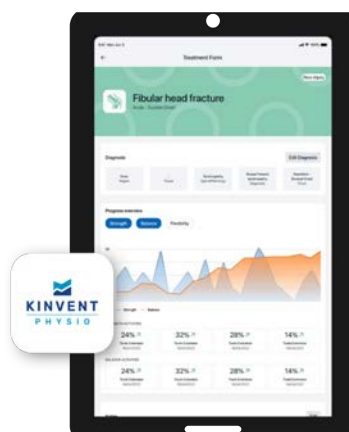


for high speed jump analysis and lower limb strength and balance

K-Move



the connected goniometer for the measurement of joint amplitudes



K-Deltas XL



for high speed jump analysis and lower limb strength and balance

Minimum Requirements: Android 5.0+ or iOS 10.0+, Bluetooth Low Energy, 5" (12.7cm) Screen diagonal

About us

KINVENT is specialized in the design and manufacturing of biomechanics equipment. Our strength is that we can conceive and implement solutions to any challenge in sports biomechanics and physical rehabilitation. Our products include ready-to-use force plates, inertial wireless sensors, simulators and various custom-made applications.

Find more information on our products at www.k-invent.com.

Important safety notice

Photosensitive seizure warning

A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns that may appear in video games. Even people who have no history of seizures or epilepsy may have an undiagnosed condition that can cause these “photosensitive epileptic seizures” while watching video games. These seizures may have a variety of symptoms, including altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion, or momentary loss of awareness. Seizures may also cause loss of consciousness or convulsions that can lead to injury.

Immediately discontinue playing and consult a doctor if you experience any of these symptoms. Parents should watch for or ask their children about the above symptoms.

CONTRAINDICATIONS

The K-Sensors are contraindicated under the following:

- On or near open wounds
- Patients having severe osteoporosis
- On or near burned tissue
- On or near the eye
- On or near fractures
- Not to be used for any purpose other than indicated

INDICATIONS

The K-Sensors are indicated under the following:

- Take care of the strong attachment or hold of each sensor.
- For a better reliability of the isometric strength measurement, the attachment position should always be the same and should be perpendicular to the exerted force direction.
- For a better reliability of the range of motion measurement, the initial position should be set as the zero-amplitude angle and the start should be pressed at this time. Take care to avoid compensation of other limbs.

WARNINGS AND PRECAUTIONS

- The K-Sensors should only be used by trained professionals.
- The K-Sensors and accessories are provided non-sterile and are not compatible with autoclave or other sterilization techniques. Do not autoclave.
- Use only a factory supplied wall pack power supply, charger. Use of another charger may result in electrical shock or equipment damage.
- K-Sensors are not intended for use while attached to wall pack power supply or a charger. Never attempt to operate the instrument while it is connected to the charger as electrical shock or damage to the instrument may occur.

- The K-Sensors are not protected against ingress of liquids. Keep sensors dry. Do not immerse the K-Sensors or their accessories in water.
- The K-Sensors are precision medical sensors. The sensors should be treated with care. Do not drop, bang, hit or subject the sensors to strong shock. Be careful to have a firm grip when holding sensors in order to avoid accidental fall of the system which may cause damage to the sensor or injury to the patient/operator.
- Not recommended for use in extreme temperatures, high humidity, or direct sunlight
- Ensure your patient is able to keep his balance while watching the screen to avoid fall
- Do not dispose of the K-Sensors sensor in fire.
- K-Sensors contain lithium-polymer batteries. *Do not dispose of the batteries with household waste*
- Sensors are not known to contain any hazardous materials. For proper disposal instructions, consult your local waste management facility. E-waste recycling should be used where available.
- Do not service the battery while in use with a patient.
- Never disassemble or modify the system using any accessories not specifically approved by KINVENT Biomécanique, LLC, this will void the warranty as well as reduce immunity to electromagnetic interference, or increase electromagnetic emissions, and result in improper operation.
- Don't place any K-Sensors components on unstable surfaces, or surfaces subject to vibration.
- Medical Electrical Equipment needs special precautions regarding EMC. K-Sensors need to be installed and put into service according to the information provided in this manual.

Replaceable Parts

- Straps
- Belts
- Handles
- Cushions
- Rubber attachments

General Operating Conditions

Operating Environment

K-Sensors must be used indoors. K-Sensors must be used only in clean, dry rooms with leveled floors. Make sure you have plenty of space around you when you use it.

Storage, Packaging and Transportation

Temperature: -10 °C to 40 °C (14 °F to 104 °F)

Air Humidity: 30 % to 75 %

When not in use, please store them in the protective carrying pouch.

If the K Sensors are stored for longer than 30 days, check battery level and recharge if necessary before using. Please observe the storage conditions and never store them in an automobile except when transporting them.

Calibration

K-Sensors gives you metrics on the human muscular force. K-Sensors are sold already calibrated, to make them ready for use out of the box.

We recommend that the product be tested for calibration at least once a year under normal use or sooner under severe conditions and usage. K-Sensors are not user serviceable and do not include a service manual. For more information on calibration as well as special requirements, please contact your K-Sensors dealer.

Interface

All K-Sensors share the same interface

- 1- Multi color LED
- 2- USB-C charge port
- 3- Power on/ Command orange button



LED States

- When the sensor is connected via USB, the sensor will turn on (**GREEN** flashing LED) and begin to charge the internal battery.
- After 10 min, if not connected to the application, it will automatically power off. The battery will continue to charge indicated by a pulsing **ORANGE** light.
- Once the battery reaches full charge the sensor will indicate this by switching to permanent **WHITE** light. If power is removed the sensor will power on again.
- The sensor can wake by plugging in the USB cable or pushing the orange button. The **GREEN** led starts blinking.
- When a successful connection over Bluetooth is attained then the light begins flashing **BLUE**
- If the battery is low, then a **RED** light will flash intermittently three times and every 5 seconds. Wireless range may be affected if operating under this condition.
- The sensor will switch off if the battery voltage is lower than 1%.
- A single push on the button will display the battery status via bright **red, yellow, or green** light depending on charge level.

Sensor is **OFF**
LED is **OFF**



Sensor is **ON**
LED is Blinking **GREEN**



Button pressed once
Shows battery status for 5 seconds.



Green >70% charge
Yellow >30% charge
Red <30%

Sensor **Connected**
LED is Blinking **BLUE**



Charging
LED Slow **ORANGE** blink



End of charge
LED is Steady **WHITE**



Sensor has **low battery (<10%)**
LED blinks **three times RED**



K-Grip



User qualification

The K-Grip must be used by a health professional.

Description

K-Grip is used for the evaluation of hand grip strength. You can assess isometric strength by the way of the peak force as well as of the average force. The Grip dynamometer quantitatively measures the grip weakness caused by injury compared to the strength of the healthy hand.

Benefits

K-Grip is equipped with electronic force transducers and gives you real-time biofeedback on your tablet or smartphone through the Kinvent Physio app. Therefore, you can set strength objectives for your patient and motivate him through the process of rehabilitation. You will, then, follow-up your patient's progress through the Kinvent Physio interactive database.

Technical Features

| | |
|---|--|
| Minimum Requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
| Weight | 170 g / 6 oz |
| Dimensions (H x W x D) A- Ribbon attachment point. B- Button | Metric : 146.5 x 36 x 60.5 mm US : 5.77 x 1.42 x 2.38 " |
| Wireless Range | Up to 40 meters / 44 yd |
| Max Force | 90 kgs / 198 lbs |
| Battery | 12 hours continuous use, 2h for charging |
| Power supply | Li-Po Battery 280 mAh |
| Radiated output Power | Max. 10 mW |
| Wireless transmission Frequency | 2.4GHz band (Bluetooth Low Energy 5.1) |
| Adjustable handle size | Soft TPE detachable (magnetic) grip covers |
| Accuracy | < 0.2%, +-0.1kg / +-0.22lbs |
| Eco features | Self activated "sleep" mode after 10 minutes. |
| Units | Selectable in application KgF, N, lbs |
| Acquisition frequency | 1000Hz |

Get Started

On the top surface of the sensor there are : one USB-C port used for charging, one LED indicator for the working state/charging state and one push-button.

You can charge your K-Grip sensor through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in/charging.

Disinfect K-Grip prior to use. Low level or intermediate level disinfectants should be used (e.g. alcohol wipes). Do not use bleach to clean the plastic parts, prefer alcohol blends

Press the orange power on button on K-Grip. The indicator begins flashing green. Your sensor is ON! Your sensor will turn off after 10 minutes of no Bluetooth connection or no application connection.

Once the sensor is turned on, select the K-Grip sensor activity in the Home Page. At this step, the K-Grip is connected and the LED starts flashing Blue.

While your K-Grip is connecting, don't apply force on the sensor, don't step on the sensor, don't move the sensor, keep it vertical on a flat surface.

Accessories

The K-Grip is provided with an attaching cord (removable) at the rear of the sensor. Use this cord to secure the sensor at the patient's arm

The K-Grip has optional changeable grip sizes that allow it to fit different sizes of hands. They are easily attached magnetically and removed by simply pulling them with about 1 kg /2 lbs of force straight forward. The sensor is supplied with the regular size bumper accessory. For further sizes please consult the catalog.

K-Push



User qualification

The K-Push must be used by a trained health professional. The user must have received sufficient training in clinical procedures to get reliable measurements.

Description

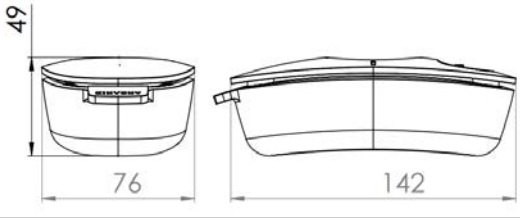
K-Push is a handheld dynamometer used for the strength evaluation of different muscles. You can assess isometric strength through the peak force as well as the average force for a specific muscle or muscle groups.

The K-Push allows to quantitatively measure the muscle strength and the deficit percentage caused by injury compared to the strength of the healthy side.

Benefits

K-Push is equipped with electronic force transducers and gives real-time acoustic and optic Biofeedback on your Smartphone or Tablet through the Kinvent Physio app. Through its Target oriented exercises, you can set objectives to your patient and encourage him to surpass himself. The app saves your participant's results. You can then follow-up his progress on Maximal Force, Endurance, and muscular Symmetry on the app's database.

Technical Features

| Minimum Requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
|--|--|
| Weight | 370 g / 13 oz (including the starter pillow) |
| Dimensions (H x W x D) | Metric 49 x 142 x 76 mm; US : 1.93 x 5.6 x 3"  |
| Wireless Range | Up to 40 meters / 44 yd |
| Max Force | 90 kgs / 198 lbs |
| Battery | 12 hours continuous use, 2h for charging |
| Power supply | Li-Po Battery 280 mAh |
| Radiated output Power | Max. 10 mW |
| Wireless transmission Frequency | 2.4GHz band (Bluetooth Low Energy 5.1) |
| Adjustable handle size | Silicon pillow with soft center |
| Accuracy | < 0.1%, +-0.1kg / +-0.22lbs |
| Eco features | Self-activated "sleep" mode after 10 minutes. |
| Units | Selectable in application KgF, N, lbs |
| Acquisition frequency | 1000Hz |

Accessories

The sensor has an option to fit accessories through the top magnetic coupling. The Twin Handle is an accessory that makes the K-Push easier to handle at greater forces. It is suitable for measures that require a stable and controlled two-handed grip. The use of a hand-held dynamometer has never been so comfortable.

The Nordic assessment set, allows secure mounting of the K Push on gym bars or iso-box to use for the nordic hamstring assessment protocol.

Get Started

The sensor comes with the cushion preinstalled on the sensor. The cushion can be very easily installed as it snaps in place.

Next, configure the strap length according to your hand and place it over it. Otherwise, you can replace the default handle by the Nordic or the Twin Handle accessory.

The cushion can be removed for cleaning. Use antiseptic alcohol wipes to **disinfect the cushion prior to use.**



To change the handle twist clockwise 45 degrees (diagonal position). The handle will lift on its own, so you can then easily pull and remove.

On the top surface of the sensor there are:

One USB-C port used for charging, one LED indicator for the working state/charging state and one push-button.

You can charge your K-Push sensor through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in/charging.

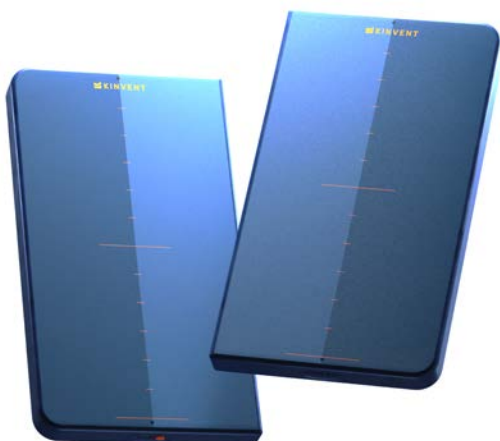
sensor

Press the orange power on button on K Push. The indicator begins flashing green. Your sensor is ON! Your sensor will turn off after 10 minutes of no Bluetooth connection or no application connection.

Once the sensor is turned on, select the K Push sensor in the Home Page. Select the body part you want to measure and then select one of the proposed exercises. Once the K Push is connected, the LED turns Blue.

While your sensor is connecting, do not load the sensor, do not step on the sensor, do not move the sensor, and do not apply force on the sensor.

K-Force Plates



User qualification

The K-Force Plates must be used by a health professional.

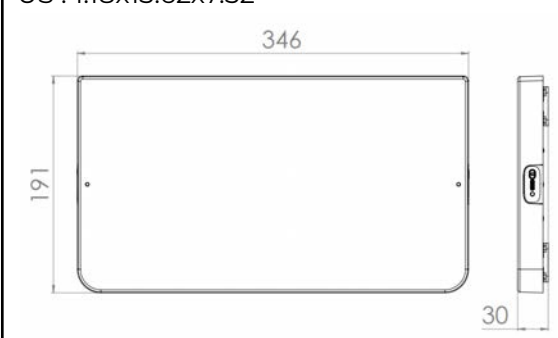
Description

K-Force Plates are two independent force platforms for rehabilitating balance and assessing lower limb muscular symmetry and strength.

Benefits

K Plates are equipped with electronic force transducers and give real-time acoustic and optic biofeedback on your Smartphone or Tablet through the Kinvent Physio app. Each platform has 4 independent sensors on the corners, allowing measurement of the center of pressure. Each foot comes with a mounting thread so that the sensor can be fixed on a surface.

Technical Features

| Minimum Requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
|--|--|
| Weight | 2000 grams / 4.4 lbs |
| Dimensions (H x W x D) | Metric 30 x 346 x 191mm US : 1.18x13.62x7.52"  |
| Wireless Range | Up to 40 meters / 44 yd |
| Max Force | 600 kg / 1322 lbs per platform |
| Battery | 20 hours continuous use, 2h for charging |
| Power supply | Li-Po Battery 800 mAh |
| Radiated output Power | Max. 10 mW |
| Wireless transmission Frequency | 2.4GHz band (Bluetooth Low Energy 5.1) |
| Accuracy | < 0.1%, +-0.1kg / +-0.22lbs |
| Eco features | Self-activated "sleep" mode after 10 minutes. |
| Units | Selectable in application KgF, N, lbs |
| Acquisition frequency | 1000Hz Full CoP |

Installation

Install K-FORCE PLATES according to the measurement selected.

On the floor

This configuration is ideal for balance exercises. You can place the K-FORCE PLATES on the ground either side by side or spaced apart. This increases the difficulty level of balance exercises, as you can work on your lower limbs muscular force at the same time.



On vertical surface

K-FORCE PLATES can be attached on a vertical surface (Wall) to measure upper limbs muscular strength, or even on weightlifting machinery such as a Leg Press Machine. To this end, use Velcro sticks with at least 200 cm² / 31 in² surface. **For your safety, please make sure that K-FORCE PLATES are well fixed on vertical surfaces before using.**

Accessories

The Jump Frame is an accessory for the K-Force Plates that allows it to stabilize the platforms and to obtain a larger surface at equal height to perform jumps in complete safety. It also allows you to adjust the distance between the plates to easily adapt it to the patient's comfort. In addition, it ensures reproducibility of measurements under similar conditions. The Jump Frame is made of rigid foam. Lightweight and transportable, it will ensure the safety of your patients.

Get started

On the side surface of the sensor there are

One USB-C port used for charging, one LED indicator for the working state/charging state and one push-button. On the top surface a second LED indicator is present that works together with the first on the side.

You can charge your K-Force Plates sensors through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in/charging

Disinfect K-FORCE PLATES prior to use, using antiseptic alcohol wipes.

Press the orange power on button on K-Force Plates. The indicators begin flashing green. Your sensor is ON! Your sensor will turn off after 10 minutes of no Bluetooth connection or no application connection. Turn on both platforms

Once the sensor is switched on, go to the homepage, and select Plates sensor and an activity.

Warning: While your sensor is connecting, do not load the sensor, do not step on the sensor, do not move the sensor, do not apply force on the sensor.

K-Bubble



User qualification

The K-Bubble must be used by a health professional.

Description

K-Bubble is a pneumatic sensor allowing to work your strength with convenient inflatable tools.

Benefits

K-Bubble is equipped with a pneumatic (pressure) sensor and gives you real-time biofeedback based on the pressure applied on the inflatable cushion used.

Technical Features

| Minimum Requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
|--|---|
| Weight | 36 g / 1.27 oz |
| Dimensions (D xH) | Metric Ø53 x30 mm ; US Ø2.09 x 1.18 " <div style="text-align: center;"> </div> |
| Wireless Range | Up to 50 meters / 54 yd |
| Max Pressure | 0.4 Bar / 5.8 PSI |
| Battery | 12 hours continuous use, 1.5h for charging |
| Power supply | Li-Po Battery 160 mAh |
| Radiated output Power | Max. 10 mW |
| Wireless transmission Frequency | 2.4GHz band (Bluetooth Low Energy 5.1) |
| Accuracy | < 1.5% |
| Eco features | Self-activated "sleep" mode after 10 minutes. |
| Units | Selectable in application KgF, N, lbs |
| Acquisition frequency | 125Hz |

Accessories

The K-Bubble accessory pack contains the following inflatable tools



Body Roll



Senso ball 23cm / 9.05"



Air Grip

Get Started

The sensor is equipped with a USB C port used for charging, 1 LED for the working/charging state and one push-button.

You can charge your K-Bubble sensor through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in / charging sensor.

Press the orange power on button on K Bubble. The indicator begins flashing green. Your sensor is ON! Your sensor will turn off after 10 minutes of no Bluetooth connection or no application connection.

Put the needle in the valve of your inflatable tool, then go to the homepage and select the corresponding inflatable tool and begin to work following the onscreen instructions.

Important

- **Moisten the needle before inserting in the inflatable accessories to prevent damage and improve the seal.**
- **Carefully insert the needle straight into the needle valve of the accessory.**
- **The needle must fit tight, without touching the internal opposite side of the inflatable accessory**

Zeroing of the pressure

The test result comparability is influenced by the pressure inside the inflatable accessory. After inserting the needle in the valve, unscrew about half a turn the needle from the socket to allow the pressure to equalize for about 5 sec. Then tighten the needle again. Please make sure that everything is tight and when squeezing and no air leak is heard or air bubbles are formed on the valve. Although the sensor is working in absolute terms and is thus unaffected by the external/internal pressure difference the inflatable accessory will behave differently if over- or under- inflated.

In order to change accessories the above process will have to be repeated.

K-Move



User qualification

The K-Move must be used by a health professional.

Description

K-Move is an inertial sensor to measure the range of motion and to compare the symmetry between the injured limb's amplitude and the healthy limb.

Benefits

K-Move is equipped with an IMU sensor and gives you real-time biofeedback based on the evolving range of motion compared to the initial movement position.

Accessories :

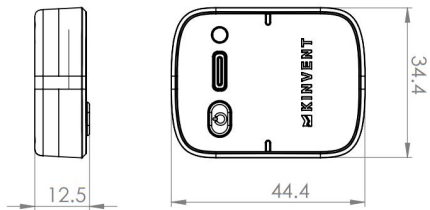
K-Move is provided with accessories for a turnkey operation:

Different size belts:

- 36cm / 14.1" used for biceps
- 57cm / 22.4" thighs/triceps
- 77cm / 30.3" torso/head



Technical Features

| | |
|--|---|
| Minimum requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
| Weight | 18 g / 0.63 oz |
| Dimensions (H x W x D) | Metric 12.5 x 34.5 x 44.5 mm ; US : 0.49 x 1.36 x 1.75 "  |
| Wireless range | Up to 50 meters / 54 yd |
| Max Accelerations | +/-16g |
| Static Accuracy | 2° |
| Dynamic accuracy (head., pitch, roll) | 7°, 2°, 2° |
| Power Supply | Li-Po Battery 160mAh |
| Battery | 12h of autonomy, 1.5h for charging |
| Wireless transmission frequency | 2.4GHz band (Bluetooth Low Energy 5.1) |
| Data rate | 400 Hz |

Get Started

The sensor is equipped with a USB C port used for charging, 1 LED for the working/charging state and one push-button.

You can charge your K-Move sensor through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in/charging

Press the orange power on button on K-Move. The indicator begins flashing green. Your sensor is ON! Your sensor will turn off after 10 minutes of no Bluetooth connection or no application connection.

Once the sensor is switched on, choose the joint's amplitude and the movement you want to assess. Attach the K-Move on the limb of your patient. Ask him to stay in a neutral position to initialize the reference position. When you click on START your patient can start moving. The range of motion is measured in degrees. Ensure the patient is not using compensation movement.

To assess a joint's amplitude of a movement not available in the list, create your own assessment.

K-Pull



User qualification

The K-Pull must be used by a health professional.

Description

Traction dynamometer for the measurement of isometric strength and biofeedback training. K-Pull enables independent measurements. It can be fixed on a physiotherapists table, on the espalier or on pulley machines.

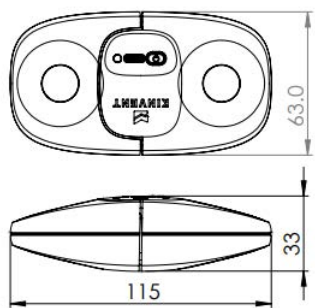
Accessories :

K-Pull is provided with accessories for a turnkey operation:

- 2 carabiners (rated for max 600 kg / 1322 lbs)
- 2 loop fastening accessories allowing attachment to a physiotherapy table or to a wall bar and to the desired limb with maximum force of 180 kg / 396 lbs
- 2 different resistance elastics for exercise with resistance.
 - Yellow Resistance Band 0.5-4 kg / 1.1 to 8.8lbs of resistance (lightest) used for Shoulders and shins
 - Red Resistance Band - 1-8 kg / 2.2 to 17.6 lbs of resistance (light) used for Biceps and triceps
- 1 adjustable rigid strap for the measurement of the maximum isometric force rated for max 600 daN / 611 kg / 1347 lbs .



Technical Features

| Minimum requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
|--|---|
| Weight | 150 g / 5.29 oz |
| Dimensions (H x W x D) | Metric: 115 x 63 x 33 mm ; US : 4.53 x 2.48 x 1.3 "  |
| Wireless Range | Up to 40 meters / 44 yd |
| Max Force | 300 Kg / 661 lbs |
| Battery | 12h of autonomy, 2h charging |
| Power supply | Li-Po battery 280 mAh |
| Wireless transmission frequency | 2.4GHz band (Bluetooth Low Energy 5.1) |
| Accuracy | < 0.1% , C3 Class |
| Acquisition frequency | 1000Hz |

Get Started

The sensor is equipped with a USB C port used for charging, 1 LED for the working/charging state and one push-button.

You can charge your K Pull sensor through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in/charging

Press the orange power on button on K-Pull. The indicator begins flashing green. Your sensor is ON! Your sensor will turn off after 10 minutes of no Bluetooth connection or no application connection.

Once the sensor is turned on, select the K-Pull sensor in the Home Page. Select the body part you want to measure and then select one of the proposed exercises. Once the K-Pull is connected, the LED turns Blue.

While your sensor is connecting, do not load the sensor, do not step on the sensor, do not move the sensor, and do not apply force on the sensor.

This is a high traction force sensor so extra care must be taken when selecting the anchoring point on the sensor or the included accessories. The strap and carabiner are rated for 600 daN /611 kg / 1347 lbs of maximum force while the elastics should not exceed an extension of 2.5 times their length.



K-Deltas

User qualification

The K-Deltas must be used by a health professional.

Description

K-Deltas are two independent force platforms for rehabilitating balance and assessing lower limb muscular symmetry and strength.

Benefits

K-Deltas are equipped with electronic force transducers and give real-time acoustic and optic biofeedback on your Smartphone or Tablet through the Kinvent Physio app.

Accessories

K-Deltas can be used with the following accessories

Deltas Frame is an accessory for the K-Force Deltas that allows it to stabilize the platforms and to obtain a larger surface at equal height to perform jumps in complete safety. In addition, it ensures reproducibility of measurements under similar conditions. The Deltas Frame is made of rigid foam. Lightweight and transportable, it will ensure the safety of your patients, it comes in a jigsaw format and can be easily dismantled for storage and transport

IMTP - Isometric Mid-Thigh pull accessory. This is a specialized , transportable tool for doing on field assessments. The accessory consists of a platform, a middle bar and a hand grip bar. The accessory along with the K-Deltas can be stored inside the same flight case.

Technical Features

| | |
|-------------------------------------|--|
| Minimum requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
| Weight | 8.8 kg/ 19.4 lbs per platform |
| Dimensions (H x W x L) | Metric 44 x 547 x368 mm US: 1.73 x 21.53 x 14.48 " |
| <i>5 mm / 0.2" ground clearance</i> | |
| Wireless range | Up to 20 meters / 22 yd |

| | |
|--|---|
| Max force | 2000 kg per platform (500kg/ sensor) 4410 lbs per platform (1103 lbs/sensor) |
| Battery | 20h of autonomy, 2h charging |
| Power supply | Li-Po battery 800 mAh |
| Radiated output power | Max.10 mW |
| Wireless transmission Frequency | 2.4 GHz band (Bluetooth Low Energy 5.1) |
| Accuracy | 0.1% |
| Acquisition frequency | 1000 Hz / 2000 Hz Full CoP |
| Cover | Anti-slip R11 film |

Installation

Install K Deltas according to the measurement programme selected according to the on-screen instructions.

On the floor

This configuration is ideal for balance exercises. You can place K Deltas on the ground either side by side or spaced apart. This increases the difficulty level of balance exercises, as you can work on your lower limbs muscular force at the same time.



Get started

Each Deltas platform is fitted with a USB C port used for charging, 1 LED for the working/charging state and one push-button.

You can charge K- Deltas sensors through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in/charging

Disinfect K- Deltas prior to use, using antiseptic alcohol wipes.

To switch on K-Deltas, press the on-off button on each platform . You will notice a green flashing LED. Your K-Deltas are on! Your K-Deltas will switch off after 10 minutes of inactivity.

Once the sensor is switched on, go to the homepage, and select K-Deltas sensor and an activity.

Warning: While your sensor is connecting, do not load the sensor, do not step on the sensor, do not move the sensor, do not apply force on the sensor.

K-Deltas XL



User qualification

The K-Deltas XL must be used by a health professional.


Description

K-Deltas XL are two independent force platforms for rehabilitating balance and assessing lower limb muscular symmetry and strength.

Benefits

K-Deltas XL are equipped with electronic force transducers and give real-time acoustic and optic biofeedback on your Smartphone or Tablet through the Kinvent Physio app.

Technical Features

| Minimum requirements | Android 5.0+ or iOS 10.0+, Bluetooth Low Energy |
|---|---|
| Weight | 12.8 kg/ 28.2lbs per platform |
| Dimensions (H x W x L) <i>5 mm/ 0.2" ground clearance</i> | 49x 810 x 470 mm Imperial: 1.93 x 31.89 x 18.5 "  |
| Wireless range | Up to 20 meters / 21 yd |
| Max force | 2400 kg per platform (600kg/ sensor) 5291 lbs per platform (1323 lbs / sensor) |
| Battery | 20h of autonomy, 2h charging |
| Power supply | Li-Po battery 800 mAh |
| Radiated output power | Max.10 mW |
| Wireless transmission Frequency | 2.4 GHz band (Bluetooth Low Energy 5.1) |
| Accuracy | 0.1% |
| Acquisition frequency | 4000 Hz Full CoP |
| Cover | Anti-slip R11 film |

Installation

Install K Deltas XL according to the measurement programme selected according to the on -screen instructions.

On the floor

This configuration is ideal for balance exercises. You can place K Deltas XL on the ground either side by side or spaced apart. This increases the difficulty level of balance exercises, as you can work on your lower limbs muscular force at the same time.



Get started

Each Deltas XL platform is fitted with a USB C port used for charging, 1 LED for the working/charging state and one push-button.

You can charge K-Deltas XL sensors through the USB A to USB C cable provided or with any USB-C charging cable. The sensor is supplied with the appropriate IEC 60601 medical USB power supply. If a different charger is used, ensure that it meets the minimum medical safety requirements and if unsure please do not use the sensor while plugged in/charging

Disinfect K-Deltas XL prior to use, using antiseptic alcohol wipes.

To switch on K-Deltas XL press the on-off button on each platform . You will notice a green flashing LED. Your K-Deltas XL are on! Your K-Deltas XL will switch off after 10 minutes of inactivity.

Once the sensor is switched on, go to the homepage, and select K-Deltas sensor and an activity.

Warning: While your sensor is connecting, do not load the sensor, do not step on the sensor, do not move the sensor, do not apply force on the sensor.

Troubleshooting

If any difficulties occur while using the system check if the symptoms appear in the following list. For further assistance please visit KINVENT's website or use the Kinvent Physio app assistance menu: "support".

Sensor difficulties

| Symptom | Actions |
|---|--|
| The sensor isn't turning on | <ol style="list-style-type: none"> 1. Connect a known working charger with a known working USB cable and charge the sensor for a minimum of 30 min. Plug and unplug the usb cable, an orange or green light should come on after a short while. 2. Press the On/Off button until an audible click is heard and felt. 3. If you suspect failure, contact your distributor or check our website for the replacement scheme or contact directly using the K PHYSIO assistance menu |
| While having closed the app, the sensors keeps the Blue LED on | <ol style="list-style-type: none"> 1. Make sure the app is closed. On Android hold the "Home" button or press the "Recently Used Apps" button to view the list of running apps. To close the app, swipe it to the left or to the right 2. Turn off the Bluetooth on the tablet or smartphone sensor. 3. Press the on/off push button for 5 sec to force it to turn off |
| The sensor isn't shutting down after 10 minutes of inactivity | <ol style="list-style-type: none"> 1. Check if an active connection is on (indicated by blue light) and close the application/bluetooth. Press optionally the on/off push button for > 5 sec to force shut down the sensor. 2. Make sure that no load is applied on the sensor. 3. If the issue persists, you can use the on-screen instruction on the app for resetting the baseline. |
| A calibration error message is shown. | <ol style="list-style-type: none"> 1. Close the app and try again while making sure that no load is applied on the sensors. For K-Force Plates / K-Deltas make sure the surface is flat and all feet are in contact with the ground and the platform does not wobble. For K-Move please do not move/bump the sensor while calibrating. 2. Contact KINVENT for scheduling a calibration. Calibration should be performed annually or sooner if special conditions apply. |
| A part is damaged/ lost | <ol style="list-style-type: none"> 1. Please contact KINVENT to arrange a replacement spare part. |

Connectivity difficulties

| Symptom | Actions |
|--|---|
| <p>The sensor is turned on but isn't connecting.</p> | <ol style="list-style-type: none"> 1. Make sure your smartphone or tablet is compatible with K Physio. 2. Check if Bluetooth and location services are enabled, on your tablet or smartphone 3. Check if the sensors are properly charged - pressing the button should light up the LED indicator and pressing a second time will bring a steady light indicating the battery charge level, make sure that it is green or orange. 4. Restart the app. On Android hold the "Home" button or press the "Recently Used Apps" button to view the list of running apps. To close the app, swipe it to the left or to the right 5. Restart your tablet or smartphone. 6. Make sure your sensor is close to your tablet or smartphone ideally no more than 5 meters/ 5.5 yd . 7. Don't pair manually the K-sensor in the Bluetooth settings of the tablet, otherwise please unpair immediately |
| <p>The sensor lost connection during training</p> | <ol style="list-style-type: none"> 1. Do not plug the USB C from the sensor to a computer or smartphone for charging during training. Only use the supplied or equivalent USB charger. |
| <p>While connecting the app is showing a gray or red circle on the sensor</p> | <ol style="list-style-type: none"> 1. Please turn off the sensor and try again. 2. Make sure that you are within range while using of the sensors 3. The official Bluetooth specifications state seven is the maximum number of Bluetooth sensors that can be connected at once. However, three to four sensors is a practical limit, depending on the sensor. Make sure that no other Bluetooth sensors (headphones/speakers etc.) are connected. |
| <p>After connection , Green led is still flashing.</p> | <ol style="list-style-type: none"> 1. Use the sensor registration menu in the application to identify using the serial number of the sensor the correct sensor. Another sensor is possibly nearby. 2. Check if other sensors are in the near area and either allow them to turn off or manually power them off. 3. In case of K Plates/ K- Deltas please verify that both a left and right sensor is present and powered on. |

Legal information

Warranty Terms

This warranty shall not apply if the product

- is used with non-compatible products
- is used for commercial purposes such as rental
- is modified
- is damaged by accident, misuse, wear, or any other cause not related to defectiveness of materials or fabrication.

A valid proof of purchase in the form of a bill of sale or receipt must be provided to obtain warranty services.

KINVENT excludes all liability for any data loss, loss of profit or any other loss or damage suffered by the end customer.

European Union

K-Sensors is warranted for its electronics and all mechanical components for a period of 2 years from the purchase date when used in accordance with the present manual. KINVENT can proceed to replace a K-Sensor covered by the warranty free of charge. The warranty is invalid in case of modification or replacement of any component in a K-Sensor, made without the KINVENT's authorization or the authorized K-Sensors dealer's authorization. KINVENT doesn't guarantee any therapeutic result when using K-Sensors. You must contact KINVENT or your authorized dealer to receive a return authorization and shipping instructions.

Other countries

K-Sensors is warranted for its electronics and all mechanical components for a period of 1 year from the purchase date when used in accordance with the present user's manual. KINVENT can proceed to replace a K-Sensor covered by the warranty free of charge. The warranty is invalid in case of modification or replacement of any component in a K-Sensor, made without the authorization of KINVENT or the authorized K-Sensors' dealer. KINVENT doesn't guarantee any therapeutic result when using K-Sensors. You must contact KINVENT or your authorized dealer to receive a return authorization and shipping instructions.

How to repackage for a return

- Pack the sensor in bubble wrap
- Print and fill the after-sales service form
- Pack the sensor + form in a package
- Stick the return voucher on the package and ship

Are considered as signs of material degradation

- Scratches
- Broken parts due to drops or inappropriate uses
- Modification or replacement of any component
- Wet environment exposition
- Underwater immersion
- Extreme temperature exposition

Service policy

You acknowledge that any time your K-Sensors product is serviced, this service may change your settings or cause loss of data or of some functionalities. Backup your data (stored on your tablet or smartphone) on a regular basis.

Warning

K-Sensors is a medical sensor. K-Sensors must be used according to the present User's Manual and its recommendations. Failure to do so may result in personal injury.

Users are responsible for their exercise manner and the manner in which they use K-Sensors. Movement promoted by K-Sensors can be associated with risks of injury.

Consult on a regular basis KINVENT's website for available information on contraindications, risks or side effects concerning K-Sensors. Kinvent doesn't offer treatment advice or any medical diagnosis.

In case you are currently under medication, injured or in delicate medical condition, consult a qualified professional prior to the use of any K-Sensors product. .

KINVENT doesn't guarantee any therapeutic result when using K-Sensors.

Declaration of Conformity

KINVENT Sensors are:

Class I measuring medical devices per Annex IX of Council Directive 93/42/EEC

K Plates, K Deltas are

Class I medical devices per CFR Title 21 Part 890 Subpart B, Sec. 890.1575

K Push, K Pull, K Grip, K Bubble are

Class II medical devices per CFR Title 21 Part 890 Subpart B, Sec. 890.1925

K Sens is

Class I medical devices per CFR Title 21 Part 888 Subpart B, Sec. 888.1500

KINVENT Sensors are:

Class II medical devices per Rule 10 of the Canadian Medical Devices Regulations

KINVENT Sensors also meet the following Technical Standards, to which Conformity is declared:

IEC 60601-1

IEC 60601-1-2

KINVENT Sensors are designed and manufactured in a facility certified to the following international standards:

ISO 9001:2015

ISO 13485:2016

FCC information

K-Sensors is a product using certain radio-frequencies during functioning. All K-Sensors equipment has been tested and found to comply with the limits for a Class B digital sensor, 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:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada

This sensor contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's license-exempt RSS(s). Operation is subject to the following two conditions:

1.This sensor may not cause interference.

2.This sensor must accept any interference, including interference that may cause undesired operation of the sensor.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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.

2.L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio transmitter has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this sensor.

Le présent émetteur radio a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antennes énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Japan

The Bluetooth module has received type certification, and is labeled with its own technical conformity mark and certification number, as required, to conform to the technical standards regulated by the Ministry of Internal Affairs and Communications (MIC) of Japan pursuant to the Radio Act of Japan.

Certificate number 020-200037, 201-190838/00

Switzerland

For the Swiss market, our product range is registered with swissmedic and our authorised representative for Switzerland (CH-REP) is Freyr Life Sciences GmbH.



United Kingdom

For the UK market, our product range is registered with the MHRA and our authorised representative for the UK (UKRP) is I3CGLOBAL(UK) (Office 54, No.58 Peregrine Road, Hainault, IG63SZ, England).

Contact Information

For any information or Assistance, please contact:

www.k-invent.com

support@k-invent.com

Rond-Point Benjamin Franklin
34000 Montpellier, FRANCE



KINVENT

MEASURE . MOVE . PROGRESS