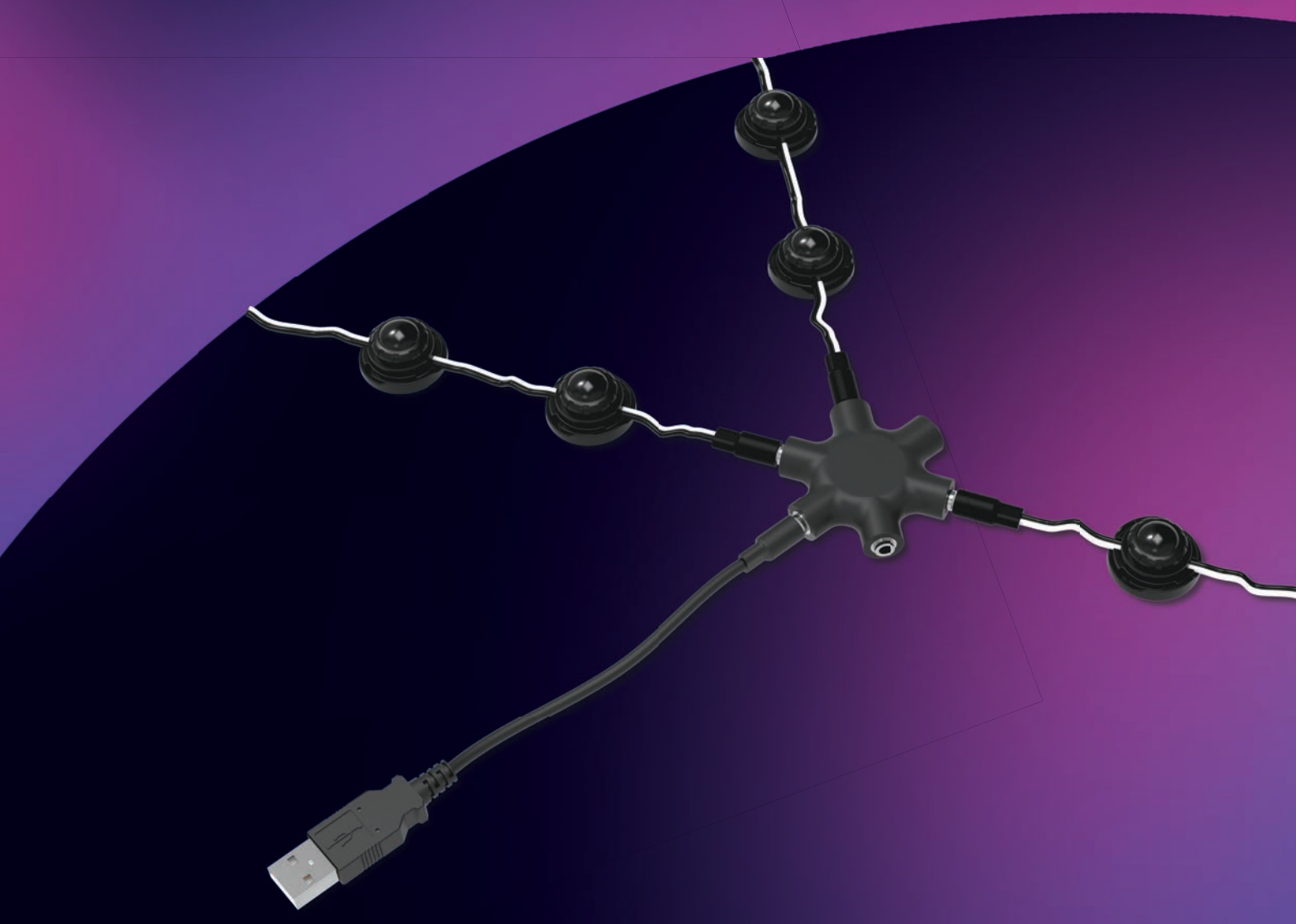
ORIGIN

Vicon Nova

Quick Start Guide



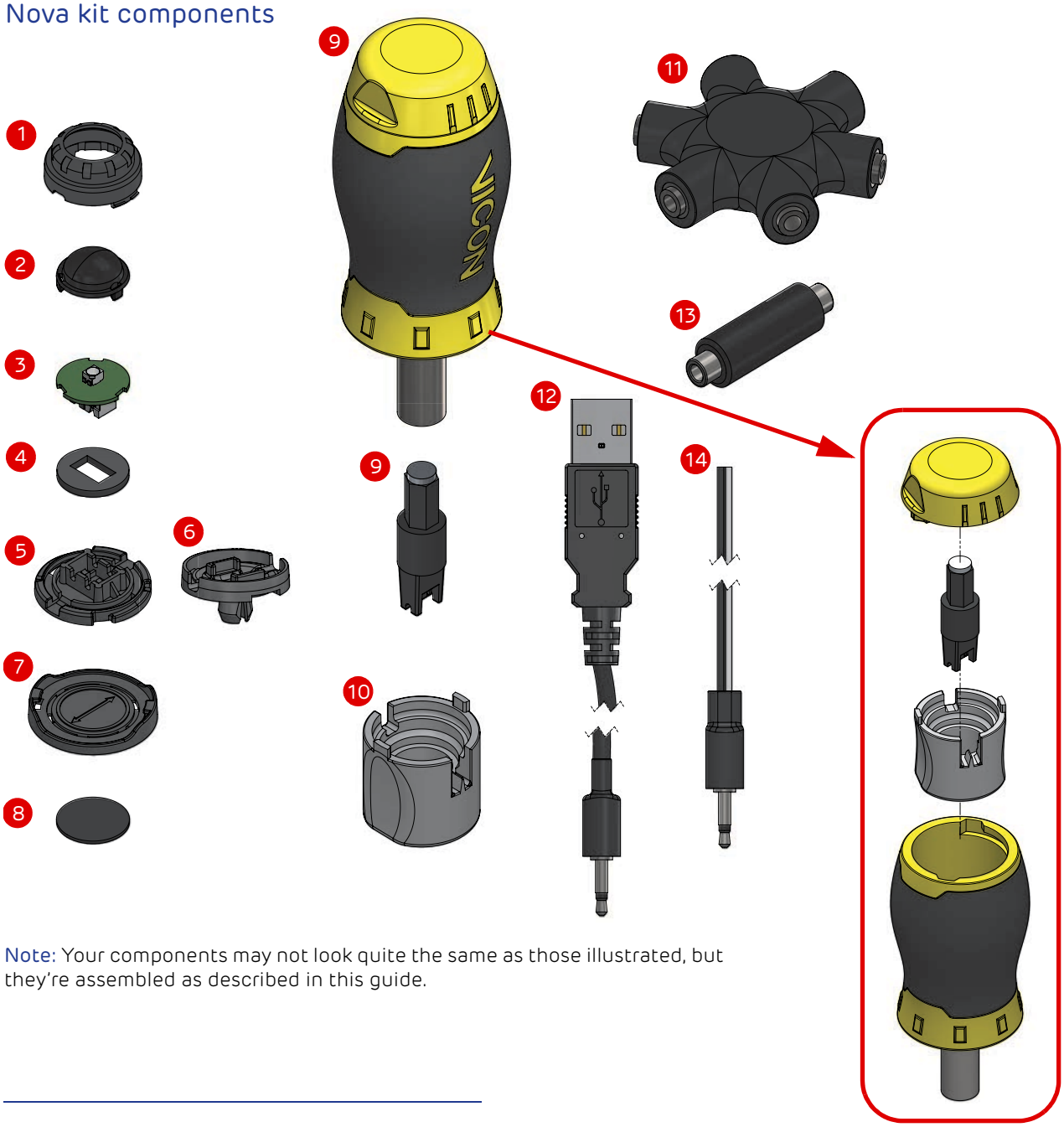
www.originbyvicon.com

A RANGE OF LOCATION BASED VR PRODUCTS BY VICON

Introducing Vicon Nova

Your Nova kit provides you with all that you need to mount one or more active markers (LEDs) on a variety of inanimate static and portable VR props*.

Nova kit components



Note: Your components may not look quite the same as those illustrated, but they're assembled as described in this guide.

*.Nova is not for use for direct body-mounting.

Components

1. Enclosure top x 10
2. Optic x 10
3. PCB x 10
4. Insulating washer x 10
5. Enclosure base x 10
   Use if you want to mount markers on the surface of a prop, with strands visible.
6. Through-hole base x 10
   Use instead of enclosure base if you need to hide strands on the inside of a prop (see About through-hole bases, right).
7. Mounting plate x 10
8. Sticky pad x 10
9. Insertion tool (two parts) x 1*
10. Insertion aid x 1*
11. Splitter x 1
12. USB power cable x 1
13. Inline 3.5 mm jack coupler x 1
14. Strand x 5

* Insertion aid & tip of insertion tool are stored in insertion tool handle.

Assembling the kit

Complete the following steps in your preferred order.

1. Connect the splitter/coupler

Connect the USB power cable to the splitter or coupler. In addition to the USB power cable, you can connect up to five strands to the splitter.

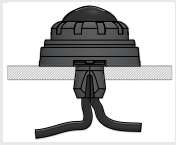
If space is too limited for a splitter and you need only a single strand (for example, if you are using a simple cylindrical prop), you can use an inline coupler instead.

2. Decide marker positions

Vicon Nova may include up to 25 active markers. You may distribute them in any combination over the 1–5 strands (eg, all on one strand, unequal numbers on each, etc). For recommendations on the best positions for markers, see Tips for marker placement on page 8.

a) Decide whether you need to hide the strands inside the prop (for examples, see page 8). If not, you can use surface-mounted enclosure bases 5. If you need to hide the strands, use through-hole bases 6.

About through-hole bases



A through-hole base lets you hide strands on the inside of a prop.
A mounting plate is not used and you thread the strands through the hole in the base to the inside of the prop.

b) Position the strands on the prop, so that you can see where to attach the markers. If required, you may cut the strands, but leave enough to reach the required position(s).

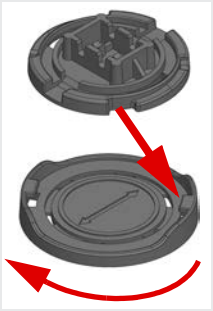
c) If you're using through-hole bases, make 6 mm holes in the prop in the required marker positions. Starting from the inside of the prop, for each marker, thread the strand through the hole in the prop and the base and back through the base into the prop, leaving loops in the strand length to attach the marker.

d) After you have decided on the required strand lengths and marker positions, you may want to detach the splitter, to make it easier to assemble the rest of the parts.

Use mounting plates for surface-mounted markers (optional)

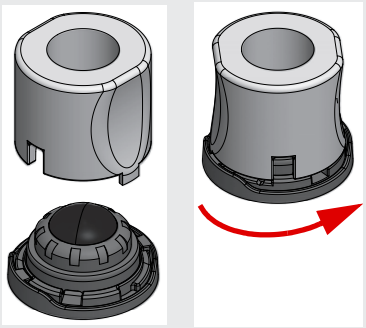
Mounting plates let you detach surface-mounted markers from props. You can attach the enclosure base of a marker to a mounting plate, which is permanently positioned on the surface of a prop. When you want to remove a marker, you detach its base from the mounting plate.

(If the active marker(s) will be permanently positioned on a prop or if you are using through-hole bases, you don't need to use mounting plates as you can attach the base directly to the prop.)

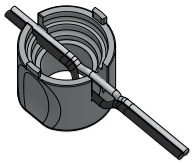


To attach an enclosure base to a mounting plate, align the two notches on the base with the two lips on the mounting plate (see image, above) and twist the enclosure base clockwise to tighten it.

To detach a marker, you can use the insertion aid to remove the enclosure base from the mounting plate. Position the insertion aid over the assembled marker (for assembly details, see page 4), and firmly twist anti-clockwise as shown below.



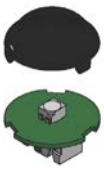
3. Split a strand



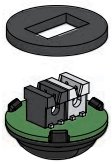
At the point on a strand where you want to attach a marker, split a short length to separate the white-striped cable from the black cable. As shown above, you can use the insertion aid to do this.

4. Attach a PCB to the strand

After you've split the strand, attach a PCB to it as follows.



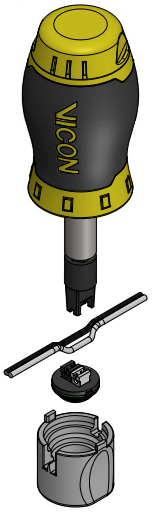
a) If you're using an optic, align its three clips with the indents on the PCB and press gently until it snaps into place.



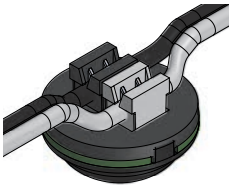
b) Peel the yellow paper from an insulating washer and carefully stick the adhesive side of the washer to the PCB.

c) Place the assembly (optic and PCB with insulating washer, and the strand) optic-down into the insertion aid, as shown below, left.

d) Align the strand so that the white-striped cable is over the white connector and the black cable is over the black connector.



e) With the insertion tool, firmly press the two cables downwards, so that they are pushed as far as possible into the connectors, as shown below.



5. Assemble the active marker

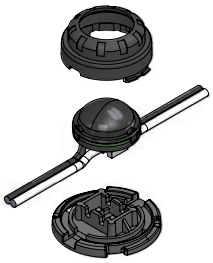
After you've attached the PCB and optic to the cable, you can assemble the active marker. Depending on the type of base that you are using, assembly will be slightly different.

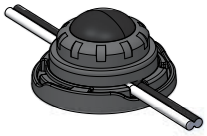
Surface-mounted enclosure base

To assemble an active marker with a surface-mounted enclosure base:

- Firmly press the enclosure top into the enclosure base over the other components, shown below.

Note that if you used a mounting plate, as described on page 3, the enclosure base will be seated in a mounting plate.



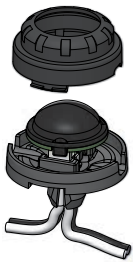


Assembled marker with surface-mounted enclosure base (left).

Through-hole base

To assemble an active marker with a through-hole base:

a) Firmly press the enclosure top into the through-hole base over the other components, as shown in the image (right). Note that the marker will be seated on the prop (not shown in these images).



b) If you haven't already done so, from the inside of the prop, pull the strand so the marker sits securely on the surface of the prop.

Assembled marker with through-hole base (left).

To create more markers, repeat steps 3–5.

Note

You can reuse a marker by detaching the PCB from a strand and attaching it to a new strand up to a maximum of three times.

6. Attach markers & trim strands

You can use the supplied sticky pads to attach surface-mounted active marker(s) to props. Alternatively, you can use any other secure method to attach the markers, such as glue, etc.

For recommendations on positioning markers, see Tips for marker placement on page 8.

Important

For safety, when everything is in place, cleanly cut the strand(s) to within 5 mm of the final PCB on each strand so that no strand emerges from the final marker(s).

7. Connect the power supply

When you have all the active markers attached to your prop(s), connect the power cable to your power source.

Check that each marker emits a faint red glow. If not, check for correct polarity of each cable connection and also that the cables are pressed fully down into the connectors. If a marker seems significantly brighter than the rest, discard it as it may be damaged.

Vicon Nova safety and regulatory information

The term "device" used in this section refers to your Vicon Nova LED Active Marker Cluster. Read this information before using your device.

Caution

This device is only intended for attachment to inanimate props within a virtual reality environment. If you have any queries on the safe use of the device, please contact Vicon Support.

Environmental regulations (United Kingdom & European Union customers)

This section lists the directives that apply to the use of Vicon Nova.

Vicon meets these European Commission directives concerning waste electrical and electronic equipment:

Restriction of the use of certain hazardous substances in electrical and electronic equipment – RoHS and recast (RoHS 2)

This device is fully RoHS- and RoHS 2-compliant. RoHS Directive 2002/95/EC provides that new electrical and electronic equipment put on the market for the first time from 1 July 2006 should not contain lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB), or polybrominated diphenyl ethers (PBDE). The European Union Directive 2011/65/EU provides that new electrical and electronic equipment put on the market for the first time from 3rd January 2014 shall not contain more than permitted levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB), or polybrominated diphenyl ethers (PBDE; PentaBDE, OctaBDE; DecaBDE), Mercury (Hg).

REACH Declaration of Conformity

Vicon Motion Systems Ltd is a manufacturer of electronic hardware. We are therefore considered a "downstream user" as far as the REACH document is concerned. Vicon Motion Systems Ltd is therefore not obligated to register with the European Agency for Chemicals 'ECHA'.

Products sold by Vicon Motion Systems Ltd are "articles" as defined in REACH (Article 3 Definitions). Moreover and under normal and reasonably foreseeable circumstances of application, the articles supplied shall not release any substance. For that, Vicon Motion Systems Ltd is neither obligatory for registration nor for the creation of material safety data sheets.

In order to assure our customers of the continual supply of reliable and safe products, we ensure that our suppliers fulfill all requirements regarding chemical substances and prepared materials.

Waste Electrical and Electronic Equipment (WEEE) (Applicable in the European Union and other European countries with separate collection systems)

The use of the symbol as a marking on the equipment, accessories or literature indicates that this product and its electronic accessories (e.g. USB cable) may not be treated as household waste. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product.

Household users should contact either the retailer where they purchased this device, or their local government office, for details of where and how they can take these items for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchasing contract. This device and its electronic accessories should not be mixed with other commercial waste for disposal.

Correct disposal of batteries when used with this device (Applicable in the European Union and other European countries with separate battery systems)

The use of the symbol as a marking on the battery, manual or packaging indicates that the battery in this device should not be disposed of with other household waste at the end of its working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources, and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

CE Declaration of Conformity

Declaration of Conformity

We, Vicon Motion Systems Ltd
Unit 6, Oxford Industrial Park
Yarnton, Oxfordshire, OX5 1QU
UNITED KINGDOM

declare under our sole responsibility that the product

VICON Nova LED Active Marker Cluster

to which the declaration relates, is in conformity with the following standards and/or other normative documents.

Safety[1]	EN60601-1:2006 + A12:2014
	Latex Free
	Photobiological safety exempt to BS EN 62471:2008 Photobiological Safety of Lamps and Lamp Systems. EU Directive 2006/25/EC.

The technical documentation that will be made available on request is kept at Vicon Motion Systems Ltd, Unit 6, Oxford Industrial Park, Yarnton, Oxfordshire, OX5 1QU, UNITED KINGDOM.

Thomas Shannon TD PhD FIE (Aust) CPEng (Biomed.)
Director

29th January 2019

1. Only connect to 5VDC USB voltage sources or 5VDC IEC 62133:2012/UL 1642 compliant battery packs with adequate power-handling capabilities. For safety, only use packs with a rated discharge current of less than 2 Amps.

Not a medical device and not for use in an operating theater, anesthetic gas or oxygen-rich environments. Not for use where there is a risk of compromising the essential performance of medical electrical equipment. Not suitable for use in high magnetic flux, ionizing radiation, sterile, or life- or safety-critical environments.

Other important safety information

- Only qualified personnel should service the device. Faulty service may be dangerous and may invalidate any warranty applicable to the device.
- Do not store or carry flammable liquids, gases, or explosive materials in the same compartments as the device, its parts, or accessories.
- For vehicles equipped with an air bag, remember that an airbag inflates with great force. Do not place objects, including portable equipment near or in the area over the air bag or in the airbag deployment area. If the device is within the deployment area as an air bag inflates, serious injury could result.
- The primary responsibility of every driver is the safe operation of his or her vehicle. Do not engage in any activity while driving a moving vehicle which may take your eyes off the road or become absorbed in any activity that your ability to concentrate on the act of driving becomes impaired.

Power source

Only connect to 5VDC USB voltage sources with adequate power handling capabilities or 5VDC Output IEC 62133:2012/UL 1642 compliant battery packs fitted with a compatible USB connector. For safety, only use packs with a rated discharge current of < 2 Amps, as packs rated above this value may exceed the current carrying capability of the interconnection cabling.

Caution: Voltage sources greater than 8VDC will permanently damage the equipment.

Battery use and safety

- If you believe the battery is damaged or needs to be replaced, return the device for inspection and replacement.
- Do not let the device or battery come in contact with liquids. Liquids can get into the device's circuits, leading to corrosion. Even when the device appears dry and appears to operate normally, the circuit could slowly corrode and pose a safety hazard.
- Do not place the device and battery in or near a heat source. Excessive heating can damage the device and battery and could cause the device or the battery to explode. Do not dry a wet or damp device with an appliance or heat source such as a microwave oven, hair dryer, iron, or radiator. Avoid leaving your device in your vehicle in high temperatures.
- Do not dispose of the device or battery in a fire. The device or battery may explode when overheated.
- Avoid dropping the device. Dropping the device, especially on a hard surface, can potentially cause damage. If you suspect damage to the device or battery, return it for inspection.
- Never use any battery that is damaged in any way.
- Warning. Use of batteries that do not contain over-voltage or over-current protection may present a risk of fire, leakage, or other hazard. Please ask Vicon Motion Systems Ltd support or your local agent for advice.
- Do not use incompatible batteries and chargers. Only use *limited power source* chargers. If using a powered USB Hub,

always ensure that you use the manufacturer's approved or recommended power source. Some websites and second-hand dealers not associated with reputable manufacturers and carriers, might be selling incompatible or even counterfeit batteries and chargers. Please refer to Vicon Motion Systems Ltd for advice. Misuse or use of incompatible batteries and chargers could result in damage to the device and a possible risk of fire, explosion, or leakage, leading to serious injuries, damage to your device, or other serious hazard.

Interconnecting cabling

The interconnecting cabling (strand) is considered single-use only, as when an active marker is installed, it cuts the insulation. If the marker is then removed, it exposes the underlying conductors.

If the device is to be used in a high-vibration environment or where the interconnecting cable may move, fit the provided insulating washer over the insulation-displacement connector on the underside of the active marker before it is mated to the cable.

Nova active markers

For safety and continued useful function, remove all loose or damaged active markers before re-use of the equipment.

Operating environment

- Avoid temperature below 0°C/ 32°F or above 37°C/99°F.
- Do not expose your device to dust, dirt, or sand.
- Do not leave the device unattended when switched on.
- Remember to follow any special regulations in force in any area, and always switch your device off whenever it is forbidden to use it, or when it may cause interference or danger. When connecting the device or any accessory to another device, read its user's guide for detailed safety instructions. Do not connect incompatible products.
- Implantable Medical Devices. A minimum separation of 6 inches (153 mm) should be maintained between the device and an implantable medical device, such as a pacemaker or implantable defibrillator, to avoid potential interference by the device. The device may use neodymium magnets to provide an easy connection to supporting holders. The operation of heart pacemakers will be affected by the close proximity of a magnet. Magnets can set a pacemaker working in a way that is not suitable for the pacemaker user and that might affect their health. This change will stop when the magnet is removed. The background to this is that magnets are used to put pacemakers into a mode of working that does not respond to the patient's own heart rhythm. Pacemaker clinics use magnets to change the working of the pacemaker, to see how it is operating. Each pacemaker manufacturer uses the 'magnet response' of a pacemaker in a different way, so it is impossible to be more precise than the above statement. Some manufacturers have a response that makes the pacemaker pace the heart at 100 beats-per-minute or faster. The pacemaker will not usually synchronize with the natural heart beat when a magnet is applied and it is theoretically possible to trigger a life threatening heart rhythm by doing so. Persons who have such implantable medical devices:
  - Should ALWAYS keep the device more than 6 inches (153 mm) from their implantable medical device when the device is turned ON;
  - Should not carry the device in a breast pocket;
  - Should immediately turn the device OFF if there is any reason to suspect that interference is taking place;
  - Should read and follow the directions from the manufacturer of your implantable medical device.

  If you have any questions about using your wireless device and/or using magnets with an implantable medical device, consult your health care provider.
- Other Medical Devices. If you use any other personal medical devices, consult the manufacturer of your device to determine if it is adequately shielded from external RF energy. Your physician may be able to assist you in obtaining this information. Immediately remove the device if there is any reason to suspect that interference is taking place. Switch your device off in health care facilities when any regulation posted in these areas instructs you to do so. Hospitals or health care facilities may be using equipment that could be sensitive to external RF energy.
- Posted Facilities. Switch your device off in any facility where posted notices require you to do so.
- High Magnetic Flux Environments. The device contains ferrous components so may constitute a physical projectile hazard if brought into high magnetic flux environments such as found within Magnetic Resonance Imaging (MRI) facilities.
- Allergies to Nickel Neodymium magnets are nickel-plated. Nickel is a metal which can cause an allergic reaction in some people who are exposed to long-term contact with objects that release nickel. As a precaution, avoid long-term contact with nickel-plated magnets and totally avoid contact with nickel-plated materials if you already have a nickel allergy. How much or little it takes to trigger a nickel allergy is debatable and changes from person to person.

Restricting children's access to your device

- Your device is not a toy. Do not allow children to play with it because they could hurt themselves and others or damage the device.
- Keep the device and all its parts and accessories out of reach of small children.
- Children (Aged 16 years or younger) should NEVER be allowed to play with NEODYMIUM magnets if they break free from the device. Even relatively small magnets can cause blood blisters and cuts and tiny magnets can cause serious injury if swallowed.
- If more than one magnet is swallowed, they can attract each other through the walls of the intestines, get stuck and pinch the digestive tract causing major swelling and even life-threatening injuries requiring surgery. Always keep any free neodymium magnets out of the reach of children.

Markers with through-hole bases are used to hide the strands

Tips for marker placement

For best tracking results, follow these recommendations when positioning the active markers on a prop:

- To ensure visibility from multiple angles, attach active markers to all or most surfaces of your prop.
- Arrange the active markers asymmetrically.
- To enable the system to differentiate between multiple props, attach the active markers in unique patterns on each prop.

Markers with surface-mounted bases are used, so the strand is visible

Vicon Nova Quick Start Guide — Revision 1.0 April 2019
For use with Vicon Nova 1.0

Vicon Motion Systems is an Oxford Metrics plc company.

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