Vixen

Instruction Manual for Wireless Unit

Preface

Thank you for your purchase of the Vixen Wireless Unit.

The Wireless Unit is to radio-control a Vixen SX series of equatorial mounts, AXJ equatorial mount, and AXD2 via your smartphone or tablet (hereafter smartphone).

Use this manual in conjunction with the manual provided for your equipment.

Applicable Models:
SX2,SXD2,SXD2-PFL,SXP,SXP-PFL,SXP2,AXJ (Non-encoders), AXD2,AXD equatorial mounts

You use a smartphone (iOS or Android) and dedicated application software (hereafter app) named STAR BOOK Wireless to control the equatorial mounts. You need to install the app on your smartphone in advance.

The SATR BOOK Wireless app is available from the following site.

STAR BOOK WIRELESS

The free download STAR BOOK Wireless app is available for iPhone and Android.
Visit our website at https://vixen.co.jp

Download on the App Store　GET IT ON Google Play

Safety Precautions

Read this manual carefully before use and follow the instructions precisely.

- Keep this manual nearby to find quick answers to questions.
- The safety precautions noted below are intended to prevent injuries to yourself and other persons or damage to the equipment. Understand the contents of this manual correctly to use the equipment.

- Do not use the product while walking or moving on the way somewhere, as injuries may arise from stumbling, falling, or collision with objects.
- Keep small caps, desiccant, or plastic packing materials away from children, as these may cause choking or suffocation.
- Do not use the product in a water-splash environment and do not handle it with wet hands. This could damage the product and could result in electrical shock.
- Do not turn on the power when internal condensation is suspected on the equipment having electronic parts. It may cause a failure.
- Do not attempt to disassemble or alter any part of the equipment not expressly described in this manual. This could damage the product and result in electric shock or may lead to injury.
- Take care to avoid dropping the product, as it may cause a failure.
- Vixen accepts no liability for damages to the camera and other equipment by contact with the product in use.

Handling and Storage

- Do not leave the product inside a car in the scorching sun, or in front of any heated sources, particularly radiators of high temperature.
- When cleaning, do not use organic solvents such as paint thinners or similar cleaners.
- Prevent the product from being exposed to rain, water droplets, heavy dew, mud, or sands. If the product becomes dirty with general smears, wipe it using a gentile cloth that was dampened and squeezed firmly.
- For storage, keep in a dry place, where it is not exposed to the direct rays of the sun. If the product gets dew condensation, dry it well in a ventilated place before storage.

Table of Contents

Before Use

Checking the Package Contents

A package of the Wireless Unit contains the items below. Check if all the items are included.

For usage of other products that are in conjunction with this unit, please refer to the manuals for those products.

Wireless Unit

Instruction Manual
(this booklet)

Startup Procedure

I Installing the App	Install the STAR BOOK Wireless app on your smartphone. Refer to the instructions provided for the smartphone on how to install the app.	P8
II Setting up the Telescope	Set up the telescope according to the instruction manual provided for your telescope.	P8
III Attaching the Wireless Unit	Attach the wireless unit to the equatorial mount.	P9 ~ 10
IV Wireless Connection between the Smartphone and the Wireless Unit	Connect between the wireless unit and the smartphone with a radio connection. To connect, refer to the instructions provided for the smartphone.	P10 ~ 12
V Starting up the App	Tap the icon of STAR BOOK Wireless on the screen to start up the app. Confirm the fundamental operation of the app.	P12 ~ 16

I. Installing the App

Install the STAR BOOK Wireless app on your smartphone. Refer to the instructions provided for the smartphone on how to install the app.

STAR BOOK WIRELESS

The free download STAR BOOK Wireless app is available for iPhone and Android.
Visit our website at https://vixen.co.jp

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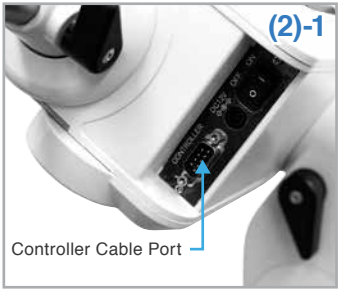
II. Setting up the Telescope

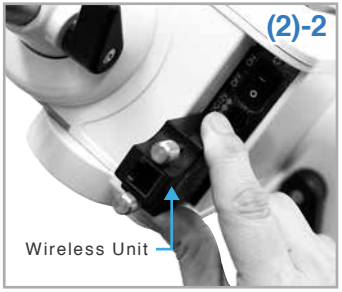
Read the instruction manual provided for your telescope in addition to this manual.

(1) Set up the telescope according to the instruction manual for your Vixen equatorial mount. If your equatorial mount comes with the STAR BOOK TEN or STAR BOOK ONE controller, the provided controller and STAR BOOK cable are not necessary for this setup.

III. Connecting the Wireless Unit

(2) Attach the Wireless Unit to the controller cable port on the equatorial mount. Plug the Wireless Unit so that the orientation of the connection can be matched to each other. Plug it to the end securely. At this stage, do not plug the power cord into the power port on the equatorial mount.





Be sure to attach the Wireless Unit first before connecting the power cord. The Wireless Unit may break if you put on it while the equatorial mount is powered. It avoids a mishap at the setting up in the dark environment where it is hard to check the position of the power switch visibly.

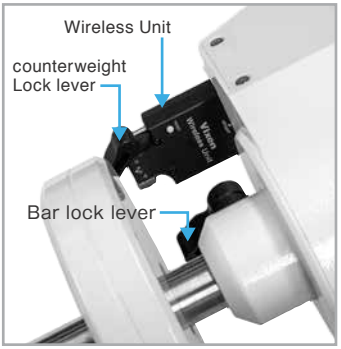
(3) Fix the Wireless Unit securely by tightening the screws accompanied.

(4) Plug the power cord into the power port on the equatorial mount.

III. Connecting the Wireless Unit

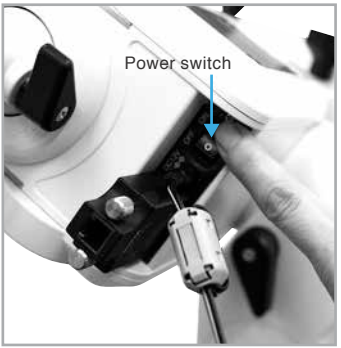
Use with the AXJ, AXD2, or AXD equatorial mount

When you attach the Wireless Unit onto the AXJ, AXD2, or AXD mount, take care not to hit the Wireless Unit by the counterweight. (The counterweight bar rotates when you move the mount in the declination.) Make sure the counterweight is not close to the Wireless Unit to avoid interference.



IV. Wireless Connection between the Smartphone and the Wireless Unit

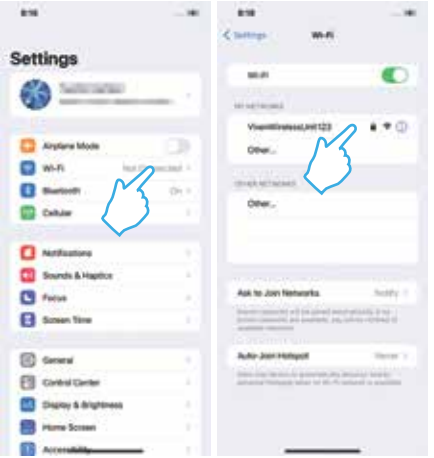
(1) Power the equatorial mount. Both the power and wireless indicators on the Wireless Unit are turned on in red light after a few seconds.



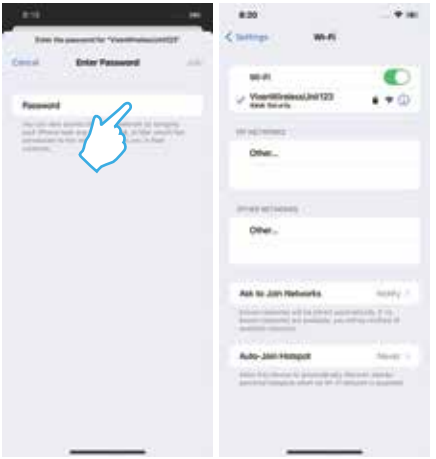
IV. Wireless Connection between the Smartphone and the Wireless Unit

(2) Open the screen of the wireless LAN connection on the smartphone and choose SSID.

Tap the Vixen Wireless Unit XXXX (XXXX are arbitrary numbers) on the screen.



(3) Tapping the SSID will proceed to the screen of entering a password. Enter the initial password “1234567890” set at Vixen’s factory. (The name of the SSID and the password are changeable arbitrarily.)



IV. Wireless Connection between the Smartphone and the Wireless Unit

(4) When the connection is completed successfully, the wireless indicator on the Wireless Unit will turn to blue light. If the light remains in red, your connection is failed. Start the procedure from (2) again.

V. Starting up the App

Confirm the blue light of the wireless indicator, and tap the icon  "STAR BOOK Wireless" on the smartphone. Now, you are ready to use the STAR BOOK Wireless.

V. Starting up the App

Basic Operation 1 / Menus on the Screen

(1) Wireless Unit Components Guide

Connector to Mount

This is a D-sub 9pin male connector for connecting the unit to the controller cable port on a mount.

Reset Button

Pressing this button a little longer (over one second) will initialize the unit to Vixen Factory default settings.

Attachment Screws

Attach the unit to the controller cable port on the mount body with these two screws.

Wireless Indicator

It indicates wireless connection status.
Disconnected if it lights red. (No communication)
Connected if it lights blue. (During communication)

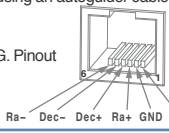
Power Indicator

If it lights red: Power ON
If it is OFF: Power OFF

Autoguider (A.G.) Port

It is possible to connect an external autoguider with the unit by using an autoguider cable.

A.G. Pinout



V. Starting up the App

(2) Menus and Displays on the Screen

You operate the telescope controller and commends by tapping and swiping the screen with a finger.

Note: The display and layout of the icons/menus shown are as of the time when Vixen produced this manual. It may change according to the update of the app.

The contents may differ depending on the version you use.

Display Mode

SCOPE MODE

The telescope is linked with the star chart. The telescope follows in the same direction as you swipe the star chart.

CHART MODE

The star chart operates independently from the telescope scope mode. The star chart is swiped with a finger for directional scrolling. Pinching in or out with two fingers will enlarge or reduce the star chart. You can choose any target on the star chart screen using these finger gestures.

Circles

Target Marker (Red)

The red circle marker points to the location of an object you have chosen as a target.

Target Circles (Green)

The double circles in green indicate the direction that includes the center of your telescope's field of view and its adjacent area.

Target Circles (White)

The double circles in white indicate the direction that includes the center of the star chart and its adjacent area.

Select Object

The moon, planets, deep-sky objects, and stars can be chosen by name or object number from the menus.

V. Starting up the App

Setup Icon

Tapping this icon will call up the menus to determine or change various settings, such as the mode of the star chart displayed, the direction of scrolling/swiping the star chart, SSID/password, and so on.

ALIGN

It shows the number of objects acquired for alignment.

Zoom Slider Bar

Magnifying the star chart allows you to make fine adjustments. The swipe motion of the star chart becomes slower as you zoom in on the star chart by sliding up the button on the slide bar.

★ Sign

Tapping this icon will call up well-known celestial objects located within the outer target circle in the center of the screen (and the center of the star chart). Tap an object you selected to point the telescope to it. The ★sign will turn to ★ << during the Go-To slewing.

Target Object Information

The direction of your telescope and the location in coordinates are displayed. The telescope icon on the left indicates the status of the telescope movement (tracked, stopped, and so on).

V. Starting up the App

Basic Operation 2 / Moving the Telescope

In the SCOPE MODE, swiping the star chart will move the telescope in the same direction according to the orientation of the star chart. You can zoom in and out the star map on the screen with the zoom slider bar.

The motion direction by a swipe can be chosen from AltAZ or RADEC.

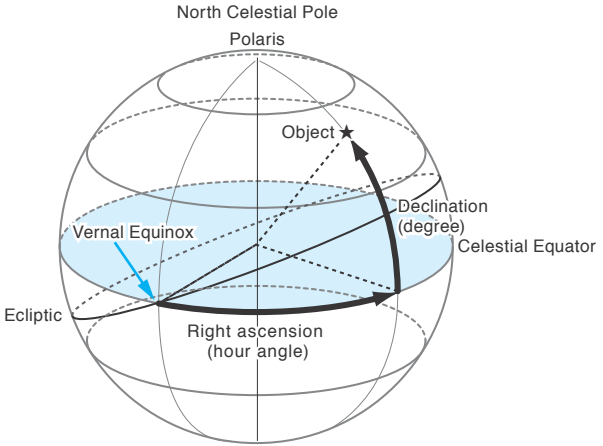
V. Starting up the App

Basic Operation 3 / Go-To Slewing

The celestial go-to navigation system stores the coordinates of vast numbers of celestial objects as the database and it allows you to find your desired celestial object of interest automatically. The moon and bright planets are found readily in the night sky as you can locate their positions with ease. However, less bright planets, nebulae, and star clusters are dim and mostly invisible with the unaided eye. Even if you know where these dim and blurred objects are in the night sky, it often takes time and effort to look for them. The Go-To slewing function will assist you in locating celestial objects easily and quickly.

The principle of Go-To Slewing

It appears that the positions of stars relative to each other in the sky are all but fixed due to their extremely long distances from us on the earth. Because of this, the star's position on celestial sphere can be measured on star maps using celestial coordinates. The right ascension of the celestial sphere corresponds to latitude, and the declination corresponds to altitude on the geographic maps. It is applied for locating celestial objects in the sky, the same as your car navigation system.



Guidance for Go-To Operation

I. Locating the Mount	Point the mount toward the north celestial pole in the northern hemisphere (the south in the southern hemisphere) so that the R.A. axis on the mount is parallel with the axis of the celestial sphere in your observing location.	**P19**
II. Setting Home Position	Loosen the clamp levers on the RA and DEC axes and move the telescope to the home position by hand. Point the optical tube to the due west horizon in the northern hemisphere (the due east horizon in the southern hemisphere) to fix it in the home position.	**P20**
III. Aligning the Telescope	You select bright stars from the list stored in the database to align their positions with the telescope. The more alignment stars you select, the more centrally located the target objects will be in your telescope's field of view.	**P21~26**
IV. Starting Go-To Slewing	You choose your target on the screen of the STAR BOOK Wireless app to start your observing session. Enjoy your observing!	**P26**

I. Locating the Mount

After setting up the telescope, locate the mount so that its RA axis points toward the north celestial pole if you use the telescope in the northern hemisphere. Unless you intend to take lengthy astrophotography, you do not need to align the R.A. axis precisely to the celestial pole. A rough setting will work well for visual observation. For details in settings, refer to the instruction manual provided for the mount.

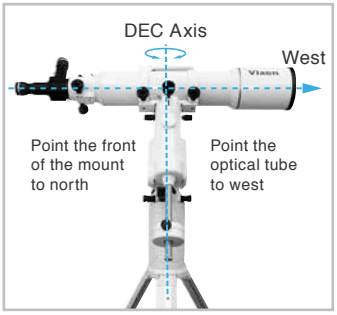
When you use the telescope in the southern hemisphere, locate the mount so that the RA axis points toward the south celestial pole. And you set the mount's elevation to be the latitude of your observing site.

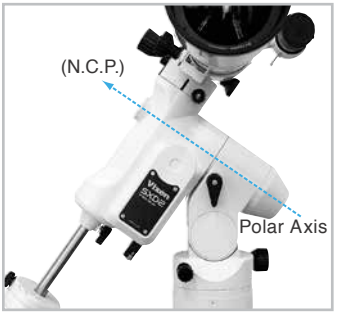
II. Setting Home Position

Loosen the R.A. and DEC clamp levers on the mount and position the telescope's optical tube by hand so that it points toward the west and is level. It is possible to slew the telescope utilizing the STAR BOOK Wireless app on a smartphone.

The STAR BOOK Wireless app works to match the position at which the telescope points with the celestial coordinates memorized in the app based on information on the location, date, and time saved by the smartphone. It implies that you have finished the first alignment at this stage. Because of this, you will probably be able to point the telescope toward the direction of a celestial object you desire to see with it next. (If the home position is accurate, the target object can be caught at least somewhere in the field of view of your finderscope.)

Refer to the drawings below on how the telescope is set at the home position.





When you fix the position of the optical tube, tighten the RA and DEC clamp levers on the mount. After this, do not touch the clamp levers until you finish your observing.

The home position is the first positioning of your telescope to decide a successful Go-To slewing. We recommend that you set the home position as accurately as possible.

III. Alignment

The alignment is to match the information on the position acquired from the celestial coordinates with the location of stars you see actually on a one-on-one basis.

As the first alignment obtained from the home position is not so much accurate, the automatic go-to slewing may not work precisely.

The process for acquisition of alignment is called “alignment” in this manual. The acquired alignments are counted by the number as one point, two points, and so forth.

Starting the Alignment

(1) Start a STAR BOOK Wireless app on the screen of your smartphone. The message "Point the telescope toward the west horizon" appears on the screen after a short while. Put the telescope in the home position. If you use the mount with the same settings you used during your last observing session, choose **Use Last Mount Setting**. This option is not available when you use the mount the first time and when you have moved the telescope. Tap Next to proceed.

If you need to adjust the initial settings in detail, tap **Initial Setting** to open initial setting menu. You can always call up the initial setting menu by tapping the Setup icon while you display the star charts.

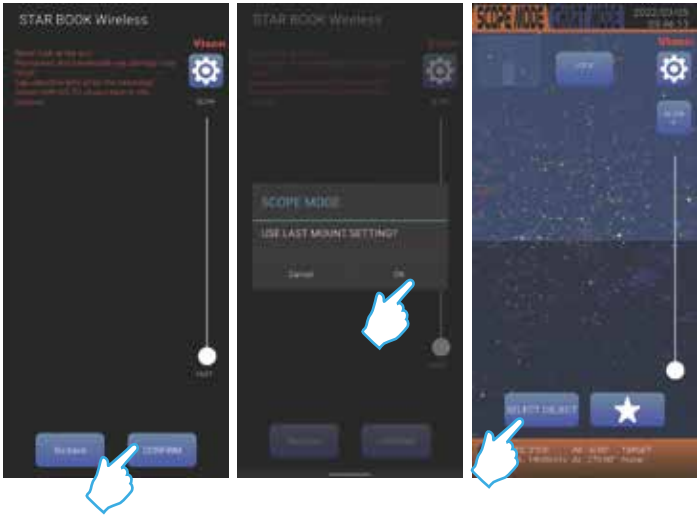
If you download the data for comets through the Internet, you are requested to start with **Initial Setting**.

III. Alignment

As you tapped on **Next** or **Use Last Mount Setting**, the Solar Warning notice would appear on the screen.

Tap **Confirm** and choose **OK** on the screen to proceed to the star chart with the SCOPE mode. The star chart where the circles at the center of the screen are directed due west is displayed.

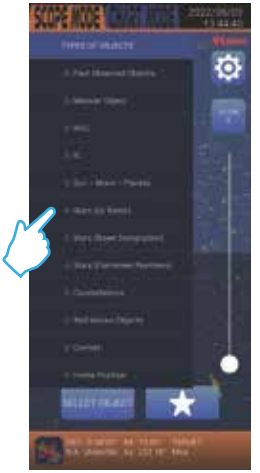
Then, tap **Select Object** on the screen to open the menu used for alignments.



Note: If the Use Last Mount Setting button is chosen, the center circles on the star chart may show you in a different direction.

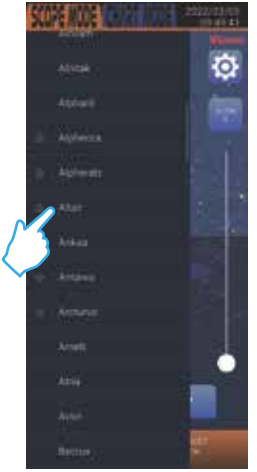
III. Alignment

(2) The Types of Objects list appears on the screen, list choose an object and you use for the acquisition of alignment. Selecting a fixed star is recommendable as the accuracy for the alignment becomes better than other celestial objects. The Fixed Star is chosen in the menu by way of example here.



(3) The names of the fixed stars appear in the menu. You choose Altair here as an example for the alignment and tap on it. The fixed stars you use for alignments should be selected from stars for which you know names and you recognize locations in the night sky.

Stars marked with ☆ are seen above the horizon and are available for alignments. You are unable to choose stars below the horizon.



III. Alignment

(4) The dialog box appears to confirm if you are ready to slew the telescope to Altair. Then, tap on **Go-To** to start the automatic slewing. The telescope starts moving toward the target. Coordinates in R.A. and DEC of Altair are displayed on the bottom of the screen.

(5) As soon as the Go-To slewing finishes, the smartphone rings or vibrates to let you know. At this stage, you may not always succeed in putting the target (Altair) into the telescope's field of view, although the telescope points toward the target.

You center the target in the field of view with the following procedures.

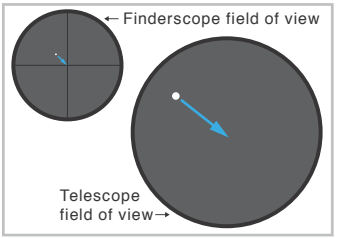
III. Alignment

(5)-1 The motion of the telescope links with the motion of a swipe on the screen's star chart. While looking through the telescope, bring Altair into the center of the field of view. Magnifying the star chart with the zoom slider will slow the motion of the telescope and thus allows you to make fine adjustments for corrections.

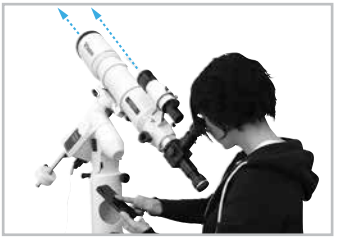
Note: Altair will be away from the center circles on the smartphone's screen as you move the telescope to look for Altair in the field of view. It is caused by a discrepancy between the actual location of Altair you look at and the position of the same star in the app's database memorized.

(5)-2

Centering Altair in the field of view of the finderscope first and following the same star with the telescope's field of view next will make the corrections easier.



After you bring Altair into the center of the finderscope's field of view, center the same star in the field of view of the telescope by using an eyepiece with low magnification. Then, you change to an eyepiece with high magnification to center the target more accurately.



III. Alignment

(5)-3 After you enter Altair into the center of the field of view, tap **Align X** (X is an arbitrary number) on the screen. The dialog box appears and confirms the alignment with Altair. Choose **OK** by tapping it. The first alignment has been completed. The target Altair comes to the center in the center circles on the star chart. The star chart on the screen turns to the SCOPE mode.

(6) It is necessary to choose several alignment stars to increase the pointing accuracy of your Go-To slewing. Repeat the procedures from (2) to (5) with different alignment stars. Aligning with stars of three or more will work practically.

IV. Go-To Slewing

You will be able to enjoy the Go-To slewing the menus of celestial objects from the Types of objects list after you make alignments with several stars. The target objects are tracked automatically and thus stay in the field of view. (Not only the diurnal motion of stars, but it also allows you to track planets and comets that have their peculiar orbital elements.)

Application

Firmware Update

An updated version of the app should be executed in accordance with instructions for updating on your smartphone. The update may be done automatically depending on the setting on the smartphone. For details, read the manuals for your smartphone.

Procedures for the firmware update.

(1) Make sure that the smartphone is fully charged. Disconnecting during the update may result in failure.

(2) Confirm that the power indicator on the Wireless Unit is lit in blue just after you turn ON the power of the equatorial mount. Then start the STAR BOOK Wireless app.

If the app includes an updated firmware version, the dialog box prompting firmware update will appear on the screen. Tap **Wireless Unit UPDATE** to advance to the next screen.

The firmware update appears on the screen, and tap **OK**. The firmware update starts. (It may take about 5 minutes at the most to finish although it depends on connection environments.)

It is advisable to put the Wireless Unit adjacent to the smartphone during the update. Do not turn OFF the power of the mount Wireless Unit-connected.

Application

Reset

You can initialize the Wireless Unit to return to the settings at the factory. Be aware that the wireless connection settings (SSID/password) are initialized, too. (The firmware has no initialization.)

Pressing the reset button for one second or longer will make the power and wireless indicators blink two times simultaneously. The Wireless Unit will be in the initial state and complete the reset.

If you used the Wireless Unit in the initial state without changing the password, the wireless connection might restart automatically as soon as you complete the reset.

Specifications

Type	Wireless connection equatorial mount controller unit
Applicable Mount	SX2, SXD2-PFL, SXP, SXP-PFL, SXP2, AXJ (Non AXJ encoders), AXD, AXD2
CPU	32bit CISC Processor 120MHz
Connector to Mount	D-SUB 9PIN male
Autoguider Port	6-pole 6-wired modular jack (for external autoguider)
Wi-Fi	With dedicated application software and use a smartphone as a user interface.
Applicable App Environment	OS : Android ver.6 or higher, iOS ver.9.0 or higher※ ・Wireless LAN Standards : IEEE 802.11b/g/n ・Data Encryption methods: WPA2-PSK ※Even if you satisfy the conditions, it may not be usable. Be sure to check the operations of the app before use.
Power Source	Supplied from a mount.
Operating Voltage / Current consumption	DC12V 0.1A (Max.)
Operating Temperature	0～40°C
Remarks	Updating via Wi-Fi / Not available for a mount with AXJ encoders.
Dimensions and Weight	56×36×19.5mm ・ 60g

Vixen

Vixen Co., Ltd.
https://www.vixen.co.jp
5-17-3 Higashitokorozawa,Tokorozawa, Saitama359-0021, Japan
Phone +81-4-2944-4141(International)
Fax +81-4-2944-9722(International)

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