

## INSTRUCTION MANUAL

ENGLISH VERSION 1.0



**VANTAGE**

**LW2231**

[www.lorextechnology.com](http://www.lorextechnology.com)

*Thank you for purchasing this product.*

*This manual refers to the following models:*

- LW2231

*To learn more about this product and to learn about our complete range of accessory products, please visit our website at:*

[www.lorextechnology.com](http://www.lorextechnology.com)



### CAUTION

**RISK OF ELECTRIC SHOCK  
DO NOT OPEN**



**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK DO NOT REMOVE COVER. NO USER SERVICABLE PARTS INSIDE.**

**REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the products' enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.**

**CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF THE PLUG TO THE WIDE SLOT AND FULLY INSERT.**



# NEED HELP?

## CONTACT US FIRST



### DO NOT RETURN THIS PRODUCT TO THE STORE

Please make sure to register your product at [www.lorextechnology.com](http://www.lorextechnology.com) to receive product updates and technical support.

## 2 Easy Ways to Contact Us



### Online:

Product Support is available 24/7 including product information, user manuals, quick start up guides and FAQ's at

**[www.lorextechnology.com/support](http://www.lorextechnology.com/support)**

For all other matters, visit **[www.lorextechnology.com](http://www.lorextechnology.com)**



### By Phone:

North America:

Customer Service (for warranty matters): **1-888-425-6739** (1-888-42-LOREX)

Tech Support (for technical/installation issues): **1-877-755-6739** (1-877-75-LOREX)

Mexico: **001-800-681-9263, 001-800-514-6739**

International: **+800-425-6739-0** (Example: From the UK, dial 00 instead of +)



## ¿NECESITA AYUDA?

**COMUNIQUESE PRIMERO  
CON NOSOTROS**

**NO DEVUELVA ESTE PRODUCTO A LA TIENDA**

Por favor, registre su producto en [www.lorextechnology.com](http://www.lorextechnology.com) para recibir actualizaciones del producto y asistencia técnica.

**Hay 2 maneras fáciles de comunicarse  
con nosotros:**

### En línea:

Apoyo al cliente está disponible 24/7, incluyendo información del producto, manuales para el usuario, guías de inicio rápido y preguntas más frecuentes en:

**[www.lorextechnology.com/support](http://www.lorextechnology.com/support)**

Para todo lo demás, visite

**[www.lorextechnology.com](http://www.lorextechnology.com)**

### Por teléfono:

Norte América:

Atención al cliente (para asuntos de la garantía - garantía válida sólo en E.U.A., vea la garantía ofrecida por el importador):

**1-888-425-6739** (1-888-42-LOREX)

Asistencia técnica (para asuntos técnicos o de instalación):

**1-877-755-6739** (1-877-75-LOREX)

Teléfono y Servicios Válidos Sólo en E.U.A.:

**001-800-681-9263, 001-800-514-6739**

Internacional: **+800-425-6739-0**

## BESOIN D'ASSISTANCE?

**COMMUNIQUEZ D'ABORD  
AVEC NOUS**

**NE RETOURNEZ PAS CE PRODUIT AU MAGASIN**

Veuillez enregistrer votre produit sur le site [www.lorextechnology.com](http://www.lorextechnology.com) afin de recevoir des mises à jour et le soutien technique pour votre produit.

**2 façons simples de communiquer  
avec nous :**

### En ligne :

À votre disposition 24/7, le soutien pour les produits comprend les renseignements sur les produits, guides d'utilisation, guides de départ rapide et FAQ :

**[www.lorextechnology.com/support](http://www.lorextechnology.com/support)**

Pour toutes les autres questions,

visitez **[www.lorextechnology.com](http://www.lorextechnology.com)**

### Par téléphone :

En Amérique du Nord :

Service à la clientèle (pour tout ce qui concerne la garantie) :

**1-888-425-6739** (1-888-42-LOREX)

Soutien technique (pour les questions d'ordre technique ou relatives à l'installation) : **1-877-755-6739** (1-877-75-LOREX)

Mexique : **001-800-681-9263, 001-800-514-6739**

International : **+800-425-6739-0**

(par exemple : à partir du Royaume-Uni, composez le 00 au lieu de +)

# BEFORE YOU START

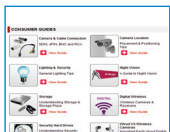
Please make sure to register your product at [www.lorextechnology.com](http://www.lorextechnology.com) to receive product updates and technical support

THIS PRODUCT MAY REQUIRE PROFESSIONAL INSTALLATION

**LOREX IS COMMITTED TO FULFILLING YOUR SECURITY NEEDS**



- We have developed user friendly products and documentation. Please read the Quick Start Guide and User Manual before you install this product.



- Consumer Guides and Video Tutorials are available on our web site at [www.lorextechnology.com/support](http://www.lorextechnology.com/support)



- If you require further installation assistance, please visit [www.lorextechnology.com/installation](http://www.lorextechnology.com/installation) or contact a professional installer.



- Please note that once the components of this product have been unsealed, you cannot return this product directly to the store without the original packaging.



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VIEW YOUR WORLD<sup>™</sup>

**VANTAGE**

# AVANT DE COMMENCER

Veuillez enregistrer votre produit sur le site [www.lorextechnology.com](http://www.lorextechnology.com) afin de recevoir des mises à jour et le soutien technique pour votre produit.

CE PRODUIT PEUT NÉCESSITER UNE INSTALLATION PROFESSIONNELLE

LOREX S'ENGAGE À RÉPONDRE À VOS BESOINS EN MATIÈRE DE SÉCURITÉ

- Nous avons conçu et développé une documentation et des produits extrêmement conviviaux. Veuillez lire le Guide de départ rapide et le Guide d'utilisation avant d'installer ce produit.
- Des guides pour consommateurs et des tutoriels vidéo vous sont offerts sur notre site Web : [www.lorextechnology.com/support](http://www.lorextechnology.com/support)
- Si vous avez besoin de plus d'assistance pour l'installation de ce produit, veuillez visiter le site [www.lorextechnology.com/installation](http://www.lorextechnology.com/installation) ou communiquez avec un installateur professionnel.
- Veuillez prendre note que lorsque vous avez déballé les pièces et composantes de ce produit, vous ne pouvez pas retourner celui-ci directement au magasin sans son emballage original.

# ANTES DE EMPEZAR

Cerciórese de por favor colocar su producto en [www.lorextechnology.com](http://www.lorextechnology.com) para recibir actualizaciones y la información del producto y soporte técnico.

ESTE PRODUCTO PUEDE EXIGIR UNA INSTALACIÓN PROFESIONAL

LOREX SE COMPROMETE A SATISFACER SUS NECESIDADES EN SEGURIDAD

- Favor de leer la guía de instalación rápida y la guía del usuario antes de instalar este producto.
- Puede conseguir las guías del consumidor y los cursos en enseñanza video sobre el Internet visitando [www.lorextechnology.com/support](http://www.lorextechnology.com/support)
- Si necesita ayuda para la instalación, visite [www.lorextechnology.com/installation](http://www.lorextechnology.com/installation) o contacte un especialista en instalaciones.
- Favor de notar que una vez que los componentes de este producto han sido removidos del embalaje, no podrá devolver este producto directamente a la tienda.



[www.lorextechnology.com](http://www.lorextechnology.com)



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VOIR VOTRE MONDE™  
VEA SU MUNDO™

**VANTAGE**

## Important Safeguards

In addition to the careful attention devoted to quality standards in the manufacture process of your product, safety is a major factor in the design of every instrument. However, safety is your responsibility too. This sheet lists important information that will help to ensure your enjoyment and proper use of the product and accessory equipment. Please read them carefully before operating and using your product.

## General Precautions

1. All warnings and instructions in this manual should be followed.
2. Do not use receivers or video monitors in humid or wet places.
3. Keep enough space around the product for ventilation. Slots and openings in the storage cabinet should not be blocked.
4. It is highly recommended to connect the product to a surge protector to protect from damage caused by electrical surges. It is also recommended to connect the product to an uninterruptible power supply (UPS), which has an internal battery that will keep the product running in the event of a power outage.
5. Remove the plug from the outlet before cleaning. Do not use liquid aerosol detergents. Use a water dampened cloth for cleaning.

## Installation

1. **Read and Follow Instructions** - All the safety and operating instructions should be read before the product is operated. Follow all operating instructions.
2. **Retain Instructions** - The safety and operating instructions should be retained for future reference.
3. **Heed Warnings** - Comply with all warnings on the product and in the operating instructions.
4. **Polarization** - Do not defeat the safety purpose of the polarized or grounding-type plug.

A polarized plug has two blades with one wider than the other.

A grounding type plug has two blades and a third grounding prong.

The wide blade or the third prong are provided for your safety.

If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.



5. **Power Sources** - This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your location, consult your video dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

6. **Overloading** - Do not overload wall outlets or extension cords as this can result in the risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cords, damaged or cracked wire insulation, and broken plugs are dangerous. They may result in a shock or fire hazard. Periodically examine the cord, and if its appearance indicates damage or deteriorated insulation, have it replaced by your service technician.

7. **Power-Cord Protection** - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

8. **Surge Protectors** - It is highly recommended that the video equipment be connected to a surge protector. Doing so will protect the equipment from damage caused by power surges. Surge protectors should bear the UL listing mark or CSA certification mark.

9. **Uninterruptible Power Supplies (UPS)** - Because this product is designed for continuous, 24/7 operation, it is recommended that you connect the product to an uninterruptible power supply. An uninterruptible power supply has an internal battery that will keep the product running in the event of a power outage. Uninterruptible power supplies should bear the UL listing mark or CSA certification mark.

**Caution:** Maintain electrical safety. Power line operated equipment or accessories connected to this product should bear the UL listing mark or CSA certification mark on the accessory itself and should not be modified so as to defeat the safety features. This will help avoid any potential hazard from electrical shock or fire. If in doubt, contact qualified service personnel.



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## Installation (Continued)

10. **Ventilation** - Slots and openings in the case are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the video equipment on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided and the product manufacturer's instructions have been followed.
11. **Attachments** - Do not use attachments unless recommended by the product manufacturer as they may cause a hazard.
12. **Water and Moisture** - Do not use receivers or video monitors near water—for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, near a swimming pool and the like.
13. **Heat** - The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.
14. **Accessories** - Do not place this video equipment on an unstable cart, stand, tripod, or table. The video equipment may fall, causing serious damage to the product. Use this product only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product. Any mounting of the product should follow the manufacturer's instructions and use a mounting accessory recommended by the manufacturer.
15. **Camera Extension Cables** - Check the rating of your extension cable(s) to verify compliance with your local authority regulations prior to installation.
16. **Mounting** - The cameras provided with this system should be mounted only as instructed in this guide or the instructions that came with your cameras, using the provided mounting brackets.
17. **Camera Installation** - Cameras are not intended for submersion in water. Not all cameras can be installed outdoors. Check your camera environmental rating to confirm if they can be installed outdoors. When installing cameras outdoors, installation in a sheltered area is required.



## Service

1. **Servicing** - Do not attempt to service this video equipment yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
2. **Conditions Requiring Service** - Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
  - A. When the power supply cord or plug is damaged.
  - B. If liquid has been spilled or objects have fallen into the product.
  - C. If the product has been exposed to rain or water.
  - D. If the product has been dropped or the cabinet has been damaged.
  - E. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
  - F. When the product exhibits a distinct change in performance. This indicates a need for service.
7. **Replacement Parts** - When replacement parts are required, have the service technician verify that the replacements used have the same safety characteristics as the original parts. Use of replacements specified by the product manufacturer can prevent fire, electric shock, or other hazards.
8. **Safety Check** - Upon completion of any service or repairs to this product, ask the service technician to perform safety checks recommended by the manufacturer to determine that the product is in safe operating condition.

## Use

1. **Cleaning** - Unplug the product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
2. **Product and Cart Combination** - Product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.
3. **Object and Liquid Entry** - Never push objects of any kind into this product through openings as they may touch dangerous voltage points or "short-out" parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
4. **Lightning** - For added protection of this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power line surges.





## WARNING

### STRANGULATION HAZARD:

Infants have STRANGLED in power cords. Keep power cords more than 3 feet away from cribs, bassinets, play yards and other safe sleep environments for infants.

## NOTICES

### FCC Notice:

This equipment has been certified and found to comply with the limits regulated by the FCC part 15, subpart C. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, 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 on and off), 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 or television technician for assistance

### Warning:

To ensure compliance with the FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm (7.87in) between the radiator and nearby persons.

### Industry Canada Notice:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesirable operation.

This Class B digital apparatus complies with Canadian ICES-003.

Le présent appareil est conforme aux CNR d'Industrie 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

### MODIFICATION:

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

Toute modification non approuvée explicitement par le fournisseur de licence de l'appareil peut entraîner l'annulation du droit de l'utilisateur à utiliser l'appareil.

### RoHS:

This product is fully compliant with the European Union Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment ("RoHS") Directive (2002/95/EC). The RoHS directive prohibits the sale of electronic equipment containing certain hazardous substances such as lead, cadmium, mercury, and hexavalent chromium, PBB, and PBDE in the European Union.

It is imperative that the user follows the guidelines in this manual to avoid improper usage which may result in damage to the product, electrical shock, and fire hazard injury. In order to improve the features, functions, and quality of this product, the specifications are subject to change without notice from time to time.

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## Features



- Real-time (up to 30fps) wireless video with MPEG-4 compression @ 640x480 (VGA) resolution<sup>1</sup>
- Extended bandwidth delivers super smooth high frame rate video<sup>1</sup>
- SignalGuard Technology continuously monitors the wireless signal and automatically reconnects upon detecting low signal strength
- Next generation adaptive Frequency Hopping Spread Spectrum (FHSS) technology greatly reduces conflicts with competing signals
- Built-in microphone for listen-in audio<sup>2</sup>
- Built-in auto-mechanical infrared camera filter achieves accurate color reproduction in varying lighting conditions
- Night vision range up to 135ft (41m) / 90ft (27m)<sup>3</sup>
- Simple installation. No video cable required<sup>4</sup>
- Weatherproof camera and power connectors, can be installed indoors or outdoors<sup>5</sup>
- Easily connects to any surveillance DVR (BNC) or TV (RCA)
- High gain antennas provide up to 165ft (50m) indoor / 500ft (152m) outdoor wireless range<sup>6</sup>
- Vandal resistant camera design with cable pass-through mounting bracket

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1. At full signal strength. Limit number of obstructions to ensure best performance.

2. Audio recording without consent is illegal in certain jurisdictions. Lorex Technology Inc. assumes no liability for use of its products that does not confirm with local laws.

3. Stated IR illumination ranges are based on ideal conditions in typical outdoor night time ambient lighting and total darkness. Actual range and image clarity depends on installation location, viewing area and light reflection/absorption level of object.

4. Camera and receiver requires a wired connection to an electrical outlet (power adapters included).

5. Not intended for submersion in water. Installation in a sheltered area required.

6. Maximum wireless transmission range. Actual range dependent upon building materials and other obstructions in path of wireless signal.

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# 1. Getting Started

The system comes with the following components:



**1 X WIRELESS CAMERA**



**1 X WIRELESS RECEIVER**



**2 X POWER ADAPTERS  
(FOR CAMERA & RECEIVER)**



**1 X MOUNTING KIT**

(Mounting kit contents may differ  
from image)



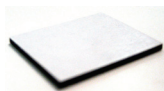
**1 X WHITE CAMERA ANTENNA  
(PRE-ATTACHED)**



**1 X BLACK RECEIVER ANTENNA  
(PRE-ATTACHED)**



**1 X BNC-TO-RCA ADAPTER**



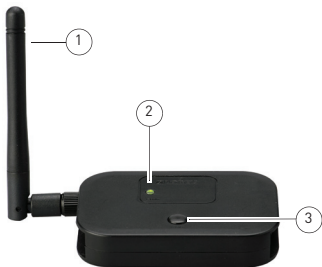
**2 X DOUBLE-SIDED TAPE**



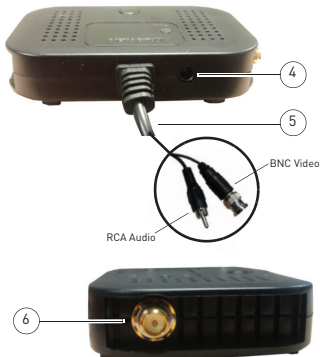
**1 X INSTRUCTION MANUAL  
1 X QUICK START GUIDE**

**CHECK YOUR PACKAGE TO CONFIRM THAT YOU HAVE RECEIVED THE COMPLETE SYSTEM,  
INCLUDING ALL COMPONENTS SHOWN ABOVE.**

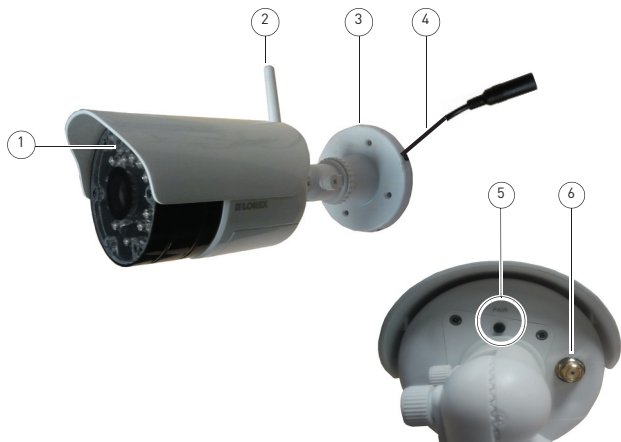
## 2. Wireless Receiver



- 1 Removable Antenna (SMA Type):** Pre-attached to the receiver.
- 2 Pairing Status LED:** Glows green continuously when a camera is paired to the receiver. Flashes on and off slowly when pairing mode is active and flashes rapidly when camera is out of range.
- 3 Pairing Button:** For details, see "Pairing Cameras" on page 9.
- 4 DC Power:** Connect power adapter to power on the receiver.
- 5 Termination Cable:** Includes BNC video output cable and RCA audio output.
- 6 Antenna Jack**



### 3. Wireless Camera



- 1 Microphone**
- 2 Removable Antenna (SMA Type):** Pre-attached to the back of camera.
- 3 Camera Stand**
- 4 DC Power:** Connect power adapter to power on the camera.
- 5 Pairing Button:** For details, see "Pairing Cameras" on page 9.
- 6 Antenna Jack**

**ATTENTION** - This camera includes an Auto Mechanical IR Cut Filter. When the camera changes between Day/Night viewing modes, an audible clicking noise may be heard from the camera. This clicking is normal and indicates that the camera filter is working.

## 4. Installing the Camera



Camera is suitable for outdoor installation.

**Installation in a sheltered location is recommended.** For example, install under shelter protected from the elements, such as beneath roof eaves. The diagram to the right shows an example of an ideal location for outdoor placement.



### 4.1 Installation Warnings

- Aim the camera to optimize the viewing area: select a location that provides a clear view of the area you want to monitor, that is free from dust, and that is not facing a strong light source or direct sunlight.
- Avoid installing the camera where there are thick walls or obstructions between the camera and the receiver.
- Avoid installing in a location which requires the wireless signal to pass through cement, concrete, and metal structures. This will reduce the range of transmission. For details, see “Appendix B: Frequently Asked Questions” on page 11.
- Select a location for the camera that has an ambient temperature between 14°F~122°F (-10°C~50°C)
- Not intended for submersion in water. For outdoor use, installation in a sheltered location is recommended.



## 4.2 Mounting Positions

You may mount your camera on a wall, ceiling, or counter. See the images below for recommended configurations of the camera stand and antenna.



Wall



Ceiling



Counter

**NOTE:** For ceiling installation, position the antenna as high as the ceiling allows. See the "Ceiling" mounting position in the figure above.

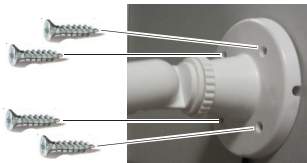


Before mounting the camera permanently, carefully plan where and how the camera will be positioned and where you will route the cable that connects the camera to the power adapter. Verify the camera's performance by observing the image on a monitor when the camera is positioned where it will be permanently installed.

## 4.3 To Install the Camera

- 1 Use the included mounting screws to mount the camera to the mounting surface:

- Mark the positions of the screw holes on the mounting surface.
- Drill holes and insert the drywall plugs (included) as needed.
- Firmly attach the camera to the mounting surface using the included screws.



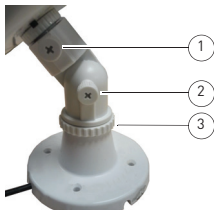
**NOTE:** If you are running the power cable through the mounting surface, connect power before firmly attaching the camera to the mounting surface.

**NOTE:** If you are running the power cable along the mounting surface, you need to run the power connector cable through the cable notch on the camera base before firmly attaching the camera to the mounting surface.

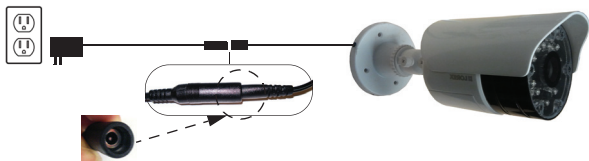


Cable Notch

- 2 Loosen the thumbscrews **(1, 2)** and the adjustment ring **(3)** by turning them counter clockwise.



- 3 Adjust the angle of the camera until the desired view is set. Tighten the thumbscrews and the adjustment ring to secure the camera's position.
- 4 Connect the power cable from the camera to the weatherproof power connector. Plug the power adapter into a power outlet or surge protector.



**NOTE:** Power cables are only weatherproof when **fully inserted** at the connection point. Power cables may not be submerged in water.

- 5 Remove protective film from the camera lens to uncover the microphone. The protective film may prevent the microphone from working if not removed.

## 5. Connecting to a DVR



Before powering on the receiver, make sure to first connect and power on the camera. This will ensure a proper connection.



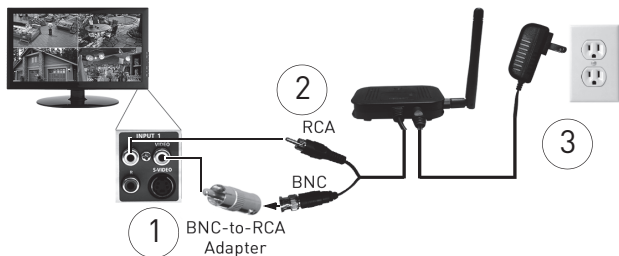
- 1 Connect the BNC video cable from the receiver to the video input on your DVR.
- 2 Connect the RCA audio cable from the receiver to the corresponding audio input. The audio input number or name should match the video input where you connect the BNC cable (e.g. Video Input 1 and Audio Input 1).
- 3 Connect the power cable to the power port on the receiver and plug it into a power outlet or surge protector.
- 4 Place the receiver where it will have clear reception to your camera<sup>1</sup>.

**NOTE:** If your camera is out of range, the pairing status LED will flash on and off rapidly.

**OPTIONAL:** Use the double-sided tape to secure the receiver to a surface (e.g. wall).

1. Avoid installing in a location which requires the wireless signal to pass through cement, concrete, and metal structures. This will reduce the range of transmission.

## 6. Connecting to a TV



- 1 Connect the included BNC-to-RCA adapter to the BNC connector on the receiver. Connect the other end of the BNC-to-RCA adapter to the RCA video input on your television.
- 2 Connect the RCA audio connector from the receiver to the audio input on your television.
- 3 Connect the power cable to the power port on the receiver and plug it into a power outlet or surge protector.
- 4 Power on your television and select the input that the receiver is connected to.
- 5 Place the receiver where it will have clear reception to your camera<sup>1</sup>.

1. Avoid installing in a location which requires the wireless signal to pass through cement, concrete, and metal structures. This will reduce the range of transmission.

## 7. Pairing Cameras

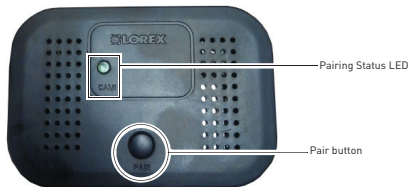
### IMPORTANT

The camera and the receiver have already been paired out of the box, which means that they are exclusively communicating with each other. If for some reason the pairing is lost, follow these steps to pair the camera and receiver.

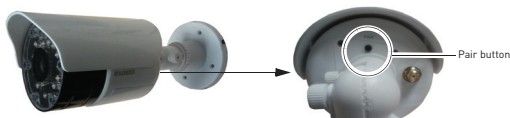
#### To pair the camera to the receiver:

- 1 Make sure that the camera and receiver are both powered up and all antennas are properly attached.
- 2 Press and hold the **PAIR** button on the receiver for 5 seconds to activate pairing mode.

The pairing status LED will flash on and off slowly.



- 3 Press the **PAIR** button on the back of the camera within 30 seconds of pressing the **PAIR** button on the receiver.
  - If pairing is successful, live video from the camera will appear on the monitor.



## 8. Appendix A: System Specifications

### 8.1 General Specifications

TX Frequency Range	2.400GHz~2.480GHz
TX Power	16dBm
Unobstructed Effective Range	165ft (50m) indoor 500ft (152m) outdoor <sup>1</sup>
Data Rate	4 Mb/s
Modulation	GFSK
Spread Spectrum	FHSS
Operating Temperature Range	14°F ~ 122°F / -10°C ~ 40°C

1. Maximum wireless transmission range. Actual range dependent upon building materials and other obstructions in path of wireless signal.

### 8.2 Receiver Specifications

RX Sensitivity	-81dBm
Demodulation	GFSK
Supported Resolution	VGA (640x480) up to 30 frames per second
Termination	1x BNC video, 1x RCA audio
Power Requirement	9V DC +/- 5%
Power Consumption	270mA Max
Dimensions (W x D x H)	53 x 137 x 86mm / 2.1 x 5.4 x 3.4" [with antenna attached]
Weight	0.1kg / 0.3lbs

### 8.3 Camera Specifications

Image Sensor Type	1/4" Color CMOS Image Sensor
Effective Pixels	H: 640 V: 480
Image Compression	MPEG4
Image Resolution	VGA (640x480)
Lens	3.6mm F2.0
Field of View (Diagonal)	55°
AGC	On
Power Requirement	9V DC +/- 5%
Power Consumption	430mA Max with IR LED 220mA Max without IR LED
Environmental Rating <sup>1</sup>	IP66
IR LED Quantity / Type	24 pieces / 850nm
Night Vision Range <sup>2</sup>	135ft (41m) / 90ft (27m)
Built in Auto IR Turn On / Off	CdS Drive Auto IR LED turn On/Off Circuit
Dimensions (W x D x H)	79 x 203 x 117mm / 3.1 x 8.0 x 4.6" [with antenna and sun-shade]
Weight	0.3kg / 0.6lbs

1. Not intended for submersion in water. Installation in a sheltered area recommended.

2. Stated IR illumination ranges are based on ideal conditions in typical outdoor night time ambient lighting and in total darkness. Actual range and image clarity depends on installation location, viewing area, and light reflection / absorption level of object.

## 9. Appendix B: Frequently Asked Questions

### 9.1 Wired vs. Wireless Cameras

A **wired camera** has a video cable that transmits the video signal from the camera to a recording or viewing device.

A **wireless camera** does not use a video cable. Instead, it wirelessly transmits the video signal to a wireless receiver that is connected to your DVR. Wireless cameras do not require video cabling to be run between the camera and the DVR, which reduces installation time and cost.

### 9.2 Does a wireless camera require power?

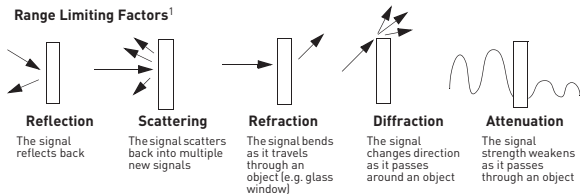
Yes. Wireless cameras require two power sources: one connected to the camera, and the other to the receiver. The term “wireless” refers to the lack of a video cable between the camera and the receiver.

### 9.3 How far can a wireless camera transmit a video signal?

In an open field (with line of sight), a typical wireless camera has a range between 250 - 500 feet. “Line-of-sight” means that there are no obstructions between the camera and receiver. Obstructions include walls, buildings, trees, and certain electronic devices. Materials containing moisture (for example, leaves) may also act as an obstruction. Cubical walls, drywall, glass, and windows generally do not degrade wireless signal strength.

In a closed environment—such as the interior of a house—the wireless camera range is between 100 - 165 feet. The signal range varies depending on the type of building materials or objects the wireless signal must pass through. The signal range also depends on whether there are competing signals using the same frequency as the camera. For example, signals from cordless phones or routers may affect signal strength. Adaptive Frequency Hopping Spread Spectrum (FHSS) technology featured in the latest Lorex models greatly reduce signal interference.

#### Range Limiting Factors<sup>1</sup>



<sup>1</sup>**Source:** Xirrus [2010]. “Wi-Fi Range Dynamics”. Retrieved online at [http://xirrus.gcsmarket.com/pdfs/Xirrus\\_Wi-Fi\\_Range.pdf](http://xirrus.gcsmarket.com/pdfs/Xirrus_Wi-Fi_Range.pdf)

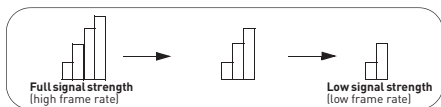
## Signal Reduction Through Materials

Signal strength decreases as it passes through different types of material. The table below shows how signals become reduced when passing through different materials:

Material	Signal Reduction (%)
Plaster & Wood	10 - 30%
Brick	30 - 50%
Concrete Cinder Blocks	50 - 70%
Metal & Metal Cladding	70 - 90%

**NOTE:** Signals that must pass through wet or moist materials (e.g. shrubs and trees) may be significantly reduced.

The stronger the signal strength, the higher the video frame rate. The lower the signal strength, the lower the video frame rate.



## 9.4 Are digital wireless camera signals secure?

Yes. Lorex digital wireless products feature a wireless transmission method called Frequency Hopping Spread Spectrum (FHSS). This type of signal is highly resistant to eavesdropping as it generates a channel hopping sequence using an algorithm generated by the receiver, which only the camera can follow through the “pairing” function.

Pairing is an electronic handshake between digital wireless devices. Digital wireless cameras can only be paired to one receiver. This is to prevent interception by third parties, and prevents any other device from picking up the signal—this also means that you cannot pair one camera to multiple receivers.

## 9.5 How many frames per second should I expect from a digital wireless camera?

Current Lorex digital wireless cameras offer 10 - 30 FPS (Frames Per Second) performance. Actual frame rate depends mainly on signal strength (see the chart in section above).

For details on supported resolutions and frame rates for this model, see “Appendix A: System Specifications” on page 10.

## 9.6 How many wireless cameras can I install?

It is recommended to install a maximum of 4 wireless cameras per system (4 receivers and 4 cameras). Minimum space between receivers should be 4 inches / 10cm and minimum space between cameras should be 6.5ft / 2m to minimize potential signal strength degradation.



## 10. Appendix C: Troubleshooting

If you have problems with your system, there is often a quick and simple solution. Please try the following:

Problem	Solution
There is no picture from the camera(s)	<ul style="list-style-type: none"> <li>• Make sure that the camera is plugged into a power outlet and that the power adapter is plugged in properly.</li> <li>• Make sure receiver is plugged into a power outlet.</li> <li>• Move the camera closer to the receiver.</li> <li>• Make sure BNC video output cable is connected to your DVR or television.</li> <li>• If you are viewing your camera(s) using a TV, make sure you have the correct input selected.</li> </ul>
There is no audio from the camera(s)	<ul style="list-style-type: none"> <li>• Make sure the RCA audio output cable is connected to your DVR or television audio input.</li> <li>• Make sure audio recording is enabled on your DVR. See your DVR manual for further instruction.</li> <li>• Make sure to remove the protective film from the camera lens. The microphone is located on the front of the camera and will not work properly if the protective film is left on.</li> </ul>
The picture is dropping	<ul style="list-style-type: none"> <li>• Move the camera closer to the receiver.</li> <li>• Try repositioning the camera, receiver, or both to improve the reception.</li> </ul>
The picture is or has become choppy	<ul style="list-style-type: none"> <li>• The picture may become choppy when experiencing a lower frame rate (e.g. 6 frames per second vs. a higher 20 frames per second).</li> <li>• Try moving the camera closer to the receiver.</li> <li>• Remove obstructions between the receiver and camera.</li> </ul>
The picture is white	<ul style="list-style-type: none"> <li>• "Washout" or "white wash" can occur when a strong light source is pointed at the camera lens. The camera lens is not harmed during a white wash.</li> <li>• Do not point your camera towards a bright light source.</li> </ul>
The picture is too dark	<ul style="list-style-type: none"> <li>• If using during the day, the camera may not be getting enough light. Reconsider the position of your camera.</li> </ul>
The picture is too bright	<ul style="list-style-type: none"> <li>• If using during the day, the camera may be getting too much light. Reconsider the position of your camera.</li> </ul>
Night vision is not working	<ul style="list-style-type: none"> <li>• Night vision activates when light levels drop. The area may have too much light.</li> </ul>
Bright spot in video when viewing camera at night	<ul style="list-style-type: none"> <li>• Night vision reflects when pointing a camera at a window. Move the camera to a different location.</li> </ul>

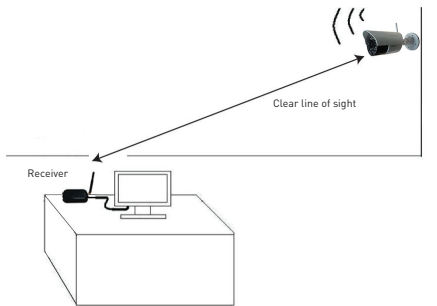
## 11. Appendix D: Extending Wireless Signal Range

**DISCLAIMER:** Certain accessories are not available in all markets.

There are several ways to boost your wireless signal as well as options to help you extend the range of the wireless signal.

### Clear Line-of-Sight

You should always try to ensure there is a clear line-of-sight between the camera and the receiver.



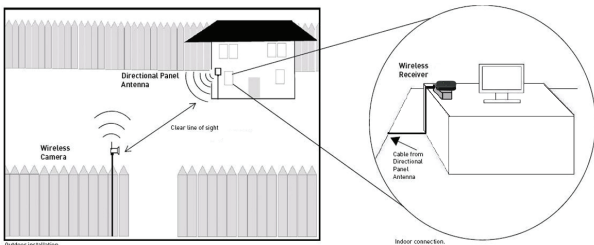
### Extending Your Wireless Signal

Even with a clear line-of-sight between your camera(s) and your receiver(s), you may experience a lower video frame rate simply due to the distance between your wireless devices.

Accessory antennas are available that can help extend the range of your wireless signal.

## 2.4 GHz Directional Wireless Panel Antenna

Use the 2.4GHz Directional Wireless Panel Antenna (model #: **ACCANTD9**) to focus a wireless signal onto the camera in order to increase the range of transmission (clear line-of-sight between the camera and the antenna is required). A 20ft extension cable is included to help to properly position the antenna.



### Scenario 1: Single Receiver Installation

Attach a directional antenna to the camera and/or the receiver. It is recommended to attach the antenna to the receiver and place it in a location that has clear line-of-sight to the camera. Ensure that the directional antenna is pointing toward the other antenna. For example, if the directional antenna is connected to your receiver, the directional antenna should point at the camera (see figure above). During the installation, check the reception on your DVR.

### Scenario 2: Multiple Camera / Receiver Installation

If you are using multiple wireless cameras and receivers in your installation, attach directional antennas to the camera(s) and receiver(s) that are farthest away from each other. Follow these guidelines to increase the signal strength between your cameras and receivers:

- Point directional antennas towards the receiver for each camera.
- Keep as much space as possible between each receiver.
- Keep as much space as possible between directional antennas if using more than one.
- Minimize the amount of obstructions (e.g. walls or trees) between the antennas and receivers.
- During the installation, check the reception of each camera on your DVR.

Visit [www.lorextechnology.com](http://www.lorextechnology.com) for more details on wireless antennas and accessories.



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