DIGITAL WIRELESS CONVERTER
FOR WIRED SECURITY CAMERA

USER’S GUIDE
LW2290B
Version 2.0
**Safety Precautions**

- Read this guide carefully and keep it for future reference.
- Follow all instructions for safe use of the product and handle with care.
- Use the system within given temperature, humidity, and voltage levels noted in the Technical Specifications.
- Do not disassemble the transmitter or receiver.
- The wireless receiver and transmitter are not weatherproof. Install in indoor locations only.
- 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, paying particular attention to cords at plugs.
- Slots and openings in the case are provided for ventilation to ensure reliable operation of the video product and to protect it from overheating. These openings must not be blocked or covered.
- Do not use attachments unless recommended in the instructions as they may cause a hazard.
- Never push objects of any kind into this video product through openings.
- Never spill liquid of any kind on the video product.
- It is recommended to use a surge protector with this video product.

**Product Description**

The Digital Wireless Converter allows an analog wired camera to transmit video and audio (optional) wirelessly*. Connect the transmitter to a wired camera to start wirelessly communicating with the receiver, which gets connected to your DVR.

* Not compatible with HD-SDI cameras.
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Product Includes

Check your package to confirm that you have received the complete system, including all components shown below.

- Wireless Transmitter x1
- Wireless Receiver x1
- Removable Wireless Antenna (SMA) x2
- Power Adapter x2
- RCA-to-RCA Coupler x1
- BNC-to-BNC Coupler x1
- BNC-to-RCA Adapter x1
- Double-Sided Tape x4

Check your package to confirm that you have received the complete system, including all components shown below.
**Wireless Receiver / Transmitter**

1. **Removable Wireless Antenna (SMA):** Connects to antenna jack.
2. **Pairing Status LED:** Glows green steadily when the transmitter and receiver are paired. Flashes on and off slowly when pairing mode is active and flashes rapidly if the units are out of range.
3. **Pairing Button:** For details, see “Pairing the Transmitter and Receiver” on page 13.
4. **DC Power:** Connect power adapter to power on the unit.
5. **Termination Cable:** Includes BNC video output and RCA audio output. An audio camera is required to use the audio function.
6. **Antenna Jack**
Getting Started

Follow the steps below to prepare your digital wireless converter for installation:

1. Identify the transmitter and receiver. Termination cables are labelled Connect to Camera on the transmitter and Connect to DVR on the receiver.

2. Attach antennas to the antenna jacks on the receiver and transmitter.

Once you have completed the steps above, determine which of the following installation options is best suited to your needs.

Standard Setup:
Your camera is connected directly to the transmitter, and the receiver is connected directly to the DVR.

See “Standard Setup” on page 6 for the standard setup procedure.

Extension Cable Setup:
An extension cable (not included) is used to connect your camera to the transmitter, and the receiver is connected directly to the DVR.

Use this setup if you want to install the transmitter far away from the camera for better reception. For example, if your camera is installed at the back of a barn and the signal strength is better at the front of the barn.


See “Extension Cable Setup” on page 8 for the extension cable setup procedure.

Television Viewing Setup:
The camera is connected directly to the transmitter, and the receiver is connected directly to a television (not included).

See “Television Viewing Setup” on page 10 for the television viewing setup procedure.

NOTE: Video and audio recording are not available through television viewing setup.
**Standard Setup**

⚠️ The wireless receiver and transmitter are not weatherproof. Install in indoor locations only.

1. Use the included RCA-to-RCA and BNC-to-BNC couplers to connect the transmitter to your wired camera.
2. Use the power adapter provided with your wired camera to connect the camera to a local power outlet.
3. Connect one of the included power adapters from the transmitter to a local power outlet.
4. Connect the BNC and RCA (optional) cables from the receiver to your DVR.
5. Connect a power adapter from the receiver to a local power outlet.
   - Live video from your camera appears on the monitor connected to your DVR*.

6. **(OPTIONAL)** Use the included double-sided tape to attach the transmitter and/or receiver to a surface.

* The digital wireless converter only supports VGA resolution (640x480 pixels). Cameras that support larger resolutions will be compressed to VGA resolution.
1. Connect the BNC-to-BNC cable between the camera and the transmitter.
2. Connect power to the transmitter.
3. Connect the transmitter to the receiver.
4. Connect the receiver to the DVR.
5. Connect power to the DVR.

* For audio cameras only
Extension Cable Setup

1. Connect your wired camera to the extension cable (not included).
2. Connect the transmitter to the other end of the extension cable.
3. Use the power adapter provided with your wired camera to connect the camera to a local power outlet.
4. Connect one of the included power adapters from the transmitter to a local power outlet.
5. Connect the BNC and RCA (optional) cables from the receiver to your DVR.
6. Connect a power adapter from the receiver to a local power outlet.

   Live video from your camera appears on the monitor connected to your DVR*.

7. (OPTIONAL) Use the included double-sided tape to attach the transmitter and/or receiver to a surface.

   * The digital wireless converter only supports VGA resolution (640x480 pixels). Cameras that support larger resolutions will be compressed to VGA resolution.

The wireless receiver and transmitter are not weatherproof. Install in indoor locations only.
* For audio cameras only

The digital wireless converter only supports VGA resolution (640x480 pixels). Cameras that support larger resolutions will be compressed to VGA resolution.
**Television Viewing Setup**

The wireless receiver and transmitter are not weatherproof. Install in indoor locations only.

1. Use the included RCA-to-RCA and BNC-to-BNC couplers to connect the transmitter to your wired camera.
2. Use the power adapter provided with your wired camera to connect the camera to a local power outlet.
3. Connect one of the included power adapters from the transmitter to a local power outlet.
4. Connect the included BNC-to-RCA adapter to the receiver’s BNC cable.
5. Connect the BNC and RCA (optional) cables from the receiver to your television. The audio input number or name should match the video input (e.g., Video Input 1 and Audio Input 1).
6. Connect a power adapter from the receiver to a local power outlet.
7. Power on your television and select the input that the receiver is connected to.
   
   Live video from your camera appears on your television*.
8. (OPTIONAL) Use the included double-sided tape to attach the transmitter and/or receiver to a surface.

* The digital wireless converter only supports VGA resolution (640x480 pixels). Cameras that support larger resolutions will be compressed to VGA resolution.
* For audio cameras only
On-Screen Display

Signal indicator: The signal indicator shows the strength of the signal being received from the transmitter. The number of bars in the signal indicator shows the strength of the signal. One or no bars indicates the signal is poor. Four bars indicate a very strong signal.

Status indicator: The message “Out of Range” appears if the receiver cannot communicate with the transmitter.

**ATTENTION:** If the signal is low (e.g., 1 or 2 bars) adjust the antennas or reposition the transmitter and/or receiver to improve signal strength.
Pairing the Transmitter and Receiver

The transmitter and receiver have already been paired. If you have received a replacement unit, OR if your transmitter and receiver are not paired up, follow the steps below.

To pair the transmitter to the receiver:

1. Make sure that the receiver and transmitter are both powered up and all antennas are properly attached.

2. Place the transmitter and the receiver within 1 ft of each other. Press and hold the **PAIR** button on the receiver for 3 seconds to activate pairing mode.
   - The indicator LED will flash on and off to indicate that pairing mode is active.
   - The on-screen displays informs you that you have 30 seconds to press the pair button on the transmitter.

3. Press the **PAIR** button on the transmitter within 30 seconds of activating pairing mode. The indicator LEDs on the receiver and transmitter will glow steadily if pairing is successful.
Appendix A: Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2.400~2.480GHz</td>
</tr>
<tr>
<td>TX Power</td>
<td>16dBm</td>
</tr>
<tr>
<td>RX Sensitivity</td>
<td>-81dBm</td>
</tr>
<tr>
<td>Maximum Wireless Range</td>
<td>492ft (150m)*</td>
</tr>
<tr>
<td>Resolution</td>
<td>VGA (640x480)</td>
</tr>
<tr>
<td>Frame Rate</td>
<td>Up to 25fps</td>
</tr>
<tr>
<td>Data Rate</td>
<td>4 Mbps</td>
</tr>
<tr>
<td>Spread Spectrum</td>
<td>FHSS</td>
</tr>
<tr>
<td>Demodulation</td>
<td>GFSK</td>
</tr>
<tr>
<td>Power Requirement</td>
<td>9V DC ± 5%</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>240mA</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>&lt; 85% RH</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>14°F ~ 104°F / -10°C ~ 50°C</td>
</tr>
<tr>
<td>Environmental Rating</td>
<td>Indoor Only</td>
</tr>
<tr>
<td>Termination</td>
<td>1x BNC video, 1x RCA audio</td>
</tr>
<tr>
<td>Weight</td>
<td>0.13lb / 0.06kg</td>
</tr>
</tbody>
</table>

*Based on unobstructed line of sight. Actual range will vary based on surroundings.

Dimensions

- 3.2” / 80mm
- 2.2” / 55mm
- 0.6” / 15mm
**Appendix B: Frequently Asked Questions**

**What are the differences between wired and wireless systems?**

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

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

**Does a wireless system require power?**

Yes. A typical wireless system requires two power sources: one connected to the camera, and the other to the receiver. The digital wireless converter requires a third power source for the transmitter.

**How far can wireless video and audio be transmitted?**

The signal range varies depending on the type of building materials and/or objects the wireless signal must pass through.

Cubical walls, drywall, glass, and windows generally do not degrade wireless signal strength. Brick, concrete floors, and walls degrade signal strength. Trees that are in the line of sight of the wireless camera and receiver may impact signal strength.

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.

**Range Limiting Factors**

- **Reflection**: The signal reflects back
- **Scattering**: The signal scatters back into multiple new signals
- **Refraction**: The signal bends as it travels through an object (e.g. glass window)
- **Diffraction**: The signal changes direction as it passes around an object
- **Attenuation**: The signal strength weakens as it passes through an object

Signal strength decreases as it passes through different types of material. Try to position your wireless transmitter and receiver in a location where the signal does not pass through metal or concrete blocks, which can significantly reduce signal strength (as shown in the table below).

<table>
<thead>
<tr>
<th>Material</th>
<th>Signal Reduction (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plaster &amp; Wood</td>
<td>10 - 30%</td>
</tr>
<tr>
<td>Brick</td>
<td>30 - 50%</td>
</tr>
<tr>
<td>Concrete Cinder Blocks</td>
<td>50 - 70%</td>
</tr>
<tr>
<td>Metal &amp; Metal Cladding</td>
<td>70 - 90%</td>
</tr>
</tbody>
</table>

**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.

Are digital wireless 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 transmitter can follow through the “pairing” function.

Pairing is an electronic handshake between digital wireless devices. Digital wireless transmitters 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 transmitter to multiple receivers.

How many digital wireless converters can I install?
It is recommended to install a maximum of 4 wireless converters per installation (4 receivers and 4 transmitters). Minimum space between receivers should be 2ft / 0.6m to minimize potential signal strength degradation.
## Appendix C: Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no picture from the camera(s)</td>
<td>• Make sure that your camera is plugged into a power outlet and that the power adapter is plugged in properly.</td>
</tr>
<tr>
<td></td>
<td>• Move the transmitter closer to the receiver.</td>
</tr>
<tr>
<td>The picture is dropping</td>
<td>• Move the transmitter closer to the receiver.</td>
</tr>
<tr>
<td></td>
<td>• Try repositioning the transmitter, receiver, or both to improve the reception.</td>
</tr>
<tr>
<td>The picture is or has become choppy</td>
<td>• The picture may become choppy when experiencing a lower frame rate (e.g. 6 frames per second vs. a higher 20 frames per second).</td>
</tr>
<tr>
<td></td>
<td>• Try moving the transmitter closer to the receiver.</td>
</tr>
<tr>
<td></td>
<td>• Remove obstructions between the receiver and transmitter.</td>
</tr>
<tr>
<td>There is no audio from the camera</td>
<td>• You must have an audio camera in order to receive audio.</td>
</tr>
<tr>
<td></td>
<td>• Ensure your television / computer speakers are not muted.</td>
</tr>
<tr>
<td></td>
<td>• Make sure the RCA audio output cable is connected to your DVR or television audio input.</td>
</tr>
<tr>
<td></td>
<td>• Make sure audio recording is enabled on your DVR. See your DVR manual for further instruction.</td>
</tr>
<tr>
<td>The picture appears fuzzy</td>
<td>• When viewing on a large-screen TV or monitor (especially high-definition televisions), the picture might seem fuzzy as the system is limited to VGA resolution (640x480), while the TV or monitor supports a much higher resolution.</td>
</tr>
<tr>
<td></td>
<td>• For best performance, use with TV PIP (Picture in Picture) function. Check your TV product manual to see if this feature is available on your TV.</td>
</tr>
</tbody>
</table>

### Need Help?

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).
**CLEANING**

Clean the product with a slightly damp cloth or an anti-static cloth. Never use cleaning agents or abrasive solvents.

- Do not clean any part of the product with cleaners with thinners or other solvents and chemicals. This may cause permanent damage to the product, which is not covered by the Warranty. When necessary, clean it with a damp cloth.

- Keep the product away from hot, humid areas or strong sunlight, and do not get it wet.

- Every effort has been made to ensure high standards of reliability for your product. However, if something does go wrong, please do not try to repair it yourself. Contact Customer Service for assistance.

**DISPOSAL OF THE DEVICE**

At the end of the product lifecycle, you should not dispose of this product with normal household waste, but take the product to a collection point for the recycling of electrical and electronic equipment. The symbol on the product, user’s guide, and/or box indicates this.

Some of the product materials can be re-used if you take them to a recycling point. By reusing some parts or raw materials from used products you make an important contribution to the protection of the environment.

Please contact your local authorities in case you need more information on the collection points in your area.

**NOTICES**

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

**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 receiver
- 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

**CAUTION:** To maintain compliance with the FCC’s RF exposure guidelines, place the transmitter and receiver at least 20cm (7.87in) from nearby persons.

**CANADA/IC 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 interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.