



# ***EZ-Bridge™***

*High Performance Point to Point Wireless Bridge System*

- Achieve up to 15 Mbit/sec speed
- Link up to 4 miles with good line of sight
- Plug and Play Simple Installation
- Best security available (WPA2)
- Field Proven Wireless Technology





## **DANGER! Avoid Powerlines! You Can Be Killed!**

When following the instructions in this guide to install the EZ-Bridge™, take extreme care to avoid contact with overhead power lines, lights and power circuits. Contact with power lines, lights or power circuits may be fatal. We recommend to install EZ-Bridge™ no closer than 20 feet to any power lines.

**Safety:** For your own protection, follow these safety rules.

- **Perform as many functions as possible on the ground**
- **Do not attempt to install the antenna on a rainy, windy or snowy day or if there is ice or snow accumulation at the install site or if the site is wet.**
- **Make sure there are no people, pets, etc. below when you are working on a roof or ladder.**
- **Watch out for any power lines which may be overhead, underground or behind walls., keeping safely clear of them with the antenna, ladders or any tools.**
- **See appendix for FCC RF exposure guidelines**



**Recommended Tools:** Pliers, Adjustable Wrench, Screws for mounting Wall Mount Bracket, Drill or Screwdriver for installing wall mount bracket, sealant for sealing any holes. **NOTE:** You should be familiar with using tools such as these before attempting installation of EZ-Bridge™. You should also be comfortable with working on a ladder.



**GROUNDING:** Local building and electrical codes require that the antenna be properly grounded. Improper installation may seriously damage the equipment or building, as well as cause injury or death to you. Run a ground wire 10AWG or bigger from back of antenna to a good earth ground (Cold water pipe or metal stake in ground).

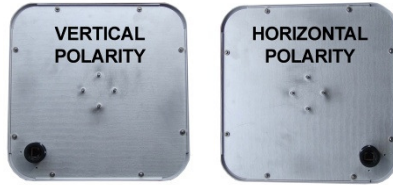


### **Getting Started**

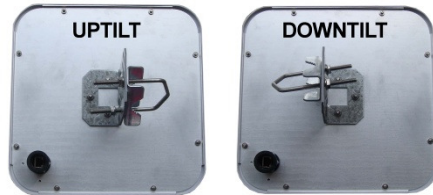
It is recommended that you setup the EZ-Bridge™ system in a single room to get acquainted with the operation of the units before installing outdoors. Connect 1 EZ-Bridge™ to your router, switch or computer and just power up the other EZ-Bridge™. Make sure the antennas are pointing away from each other for best results. After powering up each unit, you should be able to communicate with each unit by typing it's IP address into a standard browser.

## Qwik Install


**STEP 1:** Decide if install will be VERTICAL polarity or HORIZONTAL polarity. We recommend horizontal polarity because there is usually less interference. Both units MUST be installed using same polarity.



**STEP 2:** Decide if UPTILT or DOWNTILT is going to be required for the particular installation. Bracket will be attached to back of antenna to provide uptilt or downtilt by rotating the bracket install orientation 180°.



**STEP 3:** Choose a mounting location with good line of sight to the remote location. The antenna can be mounted to an existing pole up to 2" diameter or by using the provided wall mount bracket. If only short distances are needed, the antennas can be mounted inside the building. Install the antennas.

 **TECH TIP:** *Microwaves travel in straight lines and they lose strength quickly when going thru buildings and trees. If there are objects in the microwave path, then useable distance will be reduced. If the target unit is less than 1 mile away then you won't have to worry too much about a couple obstructions but if over 1 mile and there are some obstructions in the microwave path, then the performance will be reduced.*


**STEP 4:** Install the CAT5 outdoor cable by inserting the RJ45 connector thru the feedthru and into the connector on the back of the antenna. Screw the feedthru into the antenna connector and tighten against the gasket. While pushing the cable towards the connector, tighten down on the feedthru cable clamp.



**STEP 5:** Route the CAT5 cable into the building. Always create a drip loop near the antenna so the cable is not pulling on the antenna and any water running down the cable isn't going directly into the unit. Do this by creating slack in the cable and tie wrapping the cable to the pole or mount. Always seal any holes in walls or roofs properly to prevent

water ingress. The CAT5 cable can be extended indoors using a standard RJ45 coupler. The Ethernet spec allows for a maximum cable length of 100 meters or about 328 feet.

**STEP 6:** Aim the antennas and tighten the brackets securely.

 **TECH TIP:** Because of the specially designed wide beamwidth antenna, pointing is not critical and simply pointing in the general direction of the receiving antenna will yield great results.


**STEP 7:** Install the RJ45 connector on the POE Inserter to the router, switch or computer. Attach the CAT5 cable from the antenna to the RJ45 output port of the POE Inserter. Insert power supply DC plug to the POE Inserter DC Jack. Plug in the power supply to an surge protected AC power source to power up the EZ-Bridge™.



## **Software Settings**

**We strongly recommend that you create a working plug and play link before making ANY changes to the software settings**

1. There is an HTML management system built into every EZ-Bridge™ unit which is accessed thru a standard browser. The unit can communicate thru the CAT5 ethernet cable connection or thru the wireless connection, so you can manage both sides of a link from a single location.

2. **IP ADDRESS:** Default IP addresses for the EZ-Bridge™ are 192.168.1.139 and 192.168.1.239. To access the EZ-Bridge™ your computer IP address must be on the same subnet ie;  192.168.1.xxx.

**TECH TIP:** Download the EZ-Bridge™ Discovery Tool from <http://www.e-zy.net/outdoor/EZ-Bridge>. This tool will assist you in finding the EZ-Bridge™ on the network and allow you to change the EZ-Bridge IP address or set it as a DHCP client. Just select the unit, click on IP DETAILS, make selections and enter default user name and password to save changes to the device.

3. **SECURITY:** Security is pre-configured with system passwords, WPA2 encryption and Mac Address verification pre-set. This is so that you can setup a plug and play link and have confidence that the link is secure and that your data and network are safe. Once you feel comfortable with the system and its operation, we would recommend the following security changes :

a. **PASSWORD:** Change the user name and password on each side of the link by going to ADMIN | Web Access and re-setting the first user name and password. *The default is user name = **EZTEAM** and password = **link4me***



b. **ENCRYPTION:** Change the WPA2 encryption key by going to SECURITY SETTINGS .

**TECH TIP:** *When setting encryption you must setup both sides of the link to have identical encryption keys. You can setup the remote unit first and then the local unit last in order to be able to configure both units from one location across the wireless link. HEX Encryption keys can use the letters A to F, a to f and numbers 0 to 9. Passphrase keys can use any ASCII characters. The more random the key, the more secure the code.*

4. **CHANNELS:** The default channel is set to channel 11. The only reason you might want to change the channel is if you experience interference from local wireless systems which are operating on the same channel. To change the channel go to WIRELESS and change the channel. Both sides of the link must be on the same channel and if setting both units from one location, always set the remote unit first and the local unit last.

5. **TRANSMIT POWER (Tx Power):** Normally there wouldn't be any reason to change the power setting. The factory default setting is **250mW** which should be good for most applications. If you have a very short link you will actually get better performance if you turn down the Tx Power to ~100mW. This is because at close range there is too much power and it has a tendency to overload the input stage of the units and performance degrades.



**TECH TIP:** *You may want to play around with different settings to see what works best for your particular link. The measurement you would use to compare settings would be to measure the actual thruput by timing the transfer of data across the link. One program that we have found useful for determining thruput is DISKBENCH. (<http://nodesoft.com/DiskBench/>).*

6. **SITE SURVEY:** The site survey is a very useful tool to determine what wireless devices are within range of your EZ-Bridge™ and could be a source of interference that could cause degraded performance. Go to WIRELESS and then click on SITE SURVEY then REFRESH. The list will show all wireless devices including channel #, MAC Address and relative signal strength of all the devices within the range of the EZ-Bridge™ .

**NOTE:** Because SSID broadcast is disabled for security reasons, the EZ-Bridge™ won't show up in any site survey.

7. **FACTORY DEFAULTS:** If at any time the system stops working because of changes made to the settings, you can get back to the original settings by resetting to factory defaults. Go to ADMIN | Reset Settings to Defaults. You will need to reset both sides of the link in this way. Always reset the remote unit first and the local unit second. Any customized settings will be lost once this process is initiated.

8. **UPGRADE FIRMWARE:** Go to [www.e-zy.net/outdoor/EZ-Bridge](http://www.e-zy.net/outdoor/EZ-Bridge) for the latest firmware updates for EZ-Bridge™. Download the latest firmware to your PC. Select UPGRADE from the menu and then browse for the new file.

## *Advanced Features*

The EZ-Bridge has many advanced features if more functionality is desired than a simple point to point bridge application. To access the advanced features, click on [Advanced Web](#) at the top of the menu tree. This will activate the advanced menu options.

In addition to point to point secure bridging the EZ-Bridge can also be configured as an advanced access point router or an access point client. Multiple units can also be configured as a mini mesh network using WDS features available in the software.

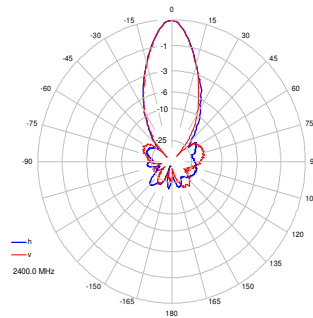
Since documentation for these advanced modes is too extensive to cover here please retrieve the documentation online at [www.e-zy.net/outdoor/EZ-Bridge](http://www.e-zy.net/outdoor/EZ-Bridge)

## Technical Specifications

Note: Subject to Change Without Notice

|   |   |
|---|---|
| <b>General</b>  |   |
| <b>Standards</b>                                      | 802.11b/g (WLAN), 802.3/802.3u (LAN)                                |
| <b>Modulation</b>                                     | (b) DSSS (DBPSK, DQPSK, CCK)<br>(g) OFDM (64QAM, 16QAM, QPSK, BPSK) |
| <b>Certifications</b>                                 | FCC / CE  |
| <b>Radio Specifications</b>                           |   |
| <b>Operating Frequency</b>                            | 2400 to 2497MHz   |
| <b>Channels</b>                                       | USA/Canada 11; Japan 14; France 4;<br>Europe 13                     |
| <b>Available Transmit Power (software selectable)</b> | 802.11b 100, 150, 200, 250mW<br>802.11g 50, 100mW                   |
| <b>Receive Sensitivity @ 11Mbps</b>                   | 802.11g -75 +2dBm @ 54Mbps<br>802.11b -84 +2dBm @ 11Mbps            |
| <b>Security</b>                                       | 64/128bit WEP, WPA, WPA2  |
| <b>Remote Config (Web Based)</b>                      | By IP Address; thru Wireless or Ethernet                            |
| <b>Antenna Specifications</b>                         |   |
| <b>Antenna Gain</b>                                   | 15 dBi  |
| <b>Antenna Beamwidth (V &amp; H)</b>                  | 35 deg  |
| <b>Antenna Front to Back</b>                          | >18dB   |
| <b>Polarization</b>                                   | Horizontal or Vertical  |
| <b>POE Specification</b>                              |   |
| <b>Power Over Ethernet Injector</b>                   | INPUT: 100 – 240VAC @ 50 – 60Hz<br>OUTPUT: 18VDC @ 0.8A             |
| <b>Mechanical Specifications</b>                      |   |
| <b>Color</b>  | White   |
| <b>Dimensions (L x W x H)</b>                         | 10.8" x 10.8" x 3" (273 x 273 x 76mm)                               |
| <b>System Weight</b>                                  | 12 lb (5 kg)  |
| <b>Ethernet Connector</b>                             | Field Replaceable Waterproof RJ45                                   |
| <b>Cable (25m long)</b>                               | CAT5E Outdoor Rated Shielded Cable                                  |
| <b>Mount</b>  | Wall or Pole (up to 2" dia) Mount                                   |
| <b>Environmental Specifications</b>                   |   |
| <b>Operating Temperature</b>                          | -22 to 122 Deg F (-30 to +50 Deg C)                                 |
| <b>Humidity</b>                                       | 0 to 100% RH  |
| <b>Wind Loading (125MPH survivability)</b>            | 100MPH / 28lbs; 125MPH / 43lbs                                      |

## Antenna Pattern



## ***TECH CORNER***

### ***Additional Information you may find useful***

1. **DHCP** – DHCP is used to automatically assign IP addresses to computers on the network. The DHCP server that is responsible for assigning the IP addresses is usually the Router that connects your network to the internet but it could be your computer if you are using Microsoft Internet Sharing. Because of the seamless and transparent nature of the EZ-Bridge™ connection, DHCP requests and responses will be passed across the wireless link. We normally recommend that only 1 DHCP server exists on a given network to avoid IP confusion. IP confusion would occur if two machines on the same network were given the same IP address. The machines would report an IP conflict error if this were the case. Keep in mind that with the EZ-Bridge™ link the two connected networks will appear as one network because they are being bridged seamlessly thru the wireless connection. If desired, the EZ-Bridge™ can also be configured as a DHCP server on the NETWORK page.

2. **RAIN, SNOW, ICE** – The 2.4GHz frequency being used by the EZ-Bridge™ will not be affected by heavy rain or falling snow. You should not see any performance degradation due to inclement weather. If snow or ice collects on the front of the antenna, you may see some reduced performance assuming you are shooting a long distance (>3miles) and the ice or snow buildup is greater than 1" thick on the surface of the antenna. For this reason, we suggest mounting under an eave of a house if feasible for your particular situation.

3. **SUN AND HEAT**– The EZ-Bridge™ is constructed of all UV protected materials so it will survive for many years in the most extreme of solar environments (ie; an Arizona rooftop during the summer). The unit has been tested and qualified for constant operation at over 122 deg F ambient temperature. Even though the EZ-Bridge™ is designed for long term survivability in extreme environments, we would still recommend that the unit be mounted in a more protected location, like under a roof eave, if possible. Of course if line of sight is better with the antenna mounted in a non-protected environment then we would recommend the better line of sight mounting location.

4. **LIGHTNING** – Lightning is the single worst enemy of outdoor electronics equipment. No electronics will survive a direct strike but there are close proximity strikes that can cause huge electrical fields to be generated which can damage electronic equipment. We have taken special care in the design of the EZ-Bridge™ unit to ensure proper

grounding of the electronics inside the enclosure to prevent damage from electrical storms. We use only the more expensive shielded CAT5e cable to prevent electrical surges being generated within the cable. Make sure that the POE Power Supply is plugged into a surge protected outlet such as a surge protected power strip or UPS inside the house.

**GROUNDING: Local building and electrical codes require that the antenna be properly grounded. Improper installation may seriously damage the equipment or building, as well as cause injury or death to you.** In order to comply with codes, the mounting bracket or pole needs to be grounded. These can be grounded by attaching a wire to the metal and running the wire to a good earth ground (cold water pipe, copper stake driven in the ground). If there are metal rain gutters on the house, the wire can be run from the wall mount bracket to the metal gutter and then another wire can be run from one of the downspouts to an earth ground. Because of the random nature of lightning, we cannot warrant the EZ-Bridge™ against damage from lightning.

**5.INTERNET ACCESS SHARING** – The EZ-Bridge™ is the perfect equipment to share your internet access with a friend or family member up to 4 miles away. Using the EZ-Bridge™ provides a seamless connection between networks and you can share the internet access available on the main network with the remote network. Please take note that certain internet service providers may not approve of this and in some cases, they may consider this to be illegal. It's best before sharing your internet connection that you check with your internet service provider to make sure you aren't in violation of your service contract.

**6.PAINTING** – The EZ-Bridge™ unit can be painted to match a particular house color. Only non metallic enamel or latex paints should be used. If a paint with metal content is used, it will block the microwaves and cause reduced performance.

**7.COMMON MICROWAVE BARRIERS** – Tinted windows are made by applying a metallized film to the window. If a window has tinting, it will usually block the microwaves and cause reduced performance of the EZ-Bridge™ . Concrete walls are also a significant barrier to microwave signals. Aluminum siding on houses is also a barrier to microwave signals. Wood frame houses covered with brick or stucco are pretty transparent to microwave signals and they will reduce the signal strength but the signal will still pass thru the structure. We are bringing this up to you so you can better understand possible causes of performance issues

**8.VOICE OVER IP (VOIP)** – The EZ-Bridge™ supports all VOIP stan-

dards making it possible to use VOIP phones across any EZ-Bridge™ link.

#### **9.TYPICAL APPLICATIONS:**

- a. Internet access sharing – share internet access with a friend or family member
- b. Link your Home Office to your Main Office - you can access shared files and folders as well as print to the main office printers and use other shared network devices remotely
- c. Link networks in multiple buildings together – A company with multiple buildings will find the EZ-Bridge™ an inexpensive way to link their buildings together. Up to 4 buildings can be linked seamlessly using EZ-Bridge™ wireless bridges.
- d. Add a high speed link between your home network and a PC in your remote studio or office which is located in an outbuilding on your property.
- e. Create an online gaming link with a friend up to 4 miles away. Reduce or eliminate extra fees you might be paying for online access for gaming purposes. And have more bandwidth for the increased complexity of future games including Voice and Video.
- f. Create a secure link for remote video and network based security cameras. The EZ-Bridge™ works with all network based security cameras.
- g. Create a streaming video conference link between buildings. Because of the high 15Mb/sec bandwidth available with the EZ-Bridge™ , it easily supports streaming video technologies used for remote conferencing, like church meetings, business meetings, etc.

## **Appendix:**

### **Federal Communication Commission Interference Statement**

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 off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. 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.

### **IMPORTANT NOTE:**

#### **FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## **Limited Warranty**

All e-zy.net products are supplied with a limited 12 month warranty which covers material and workmanship defects. This warranty does not cover the following:

- Parts requiring replacement due to improper installation, misuse, poor site conditions, faulty power, etc.
- Lightning damage.
- Physical damage to the external & internal parts.
- Products that have been opened, altered, or defaced.
- Water damage for units that were not sealed or mounted according to user manual.
- Units that were not properly grounded.
- Usage other than in accordance with instructions and the normal intended use.

Do not return any products until you receive a Return Material Authorization (RMA) number. Products received without a valid RMA number will be rejected and returned to sender.

## **Warranty Repairs**

All returns must have a valid RMA number written clearly on the outside of the box. Without an RMA number the shipment will be refused. For customers located in United States and Canada, customer pays all shipping charges incurred to ship the product to E-ZY.NET. E-ZY.NET pays shipping charges to return the product to the original purchaser. For all other countries, the original purchaser shall pay all shipping, broker fees, duties and taxes incurred in shipping products to and from E-ZY.NET. Provided the goods have not been modified or repair attempted by someone other than E-ZY.NET, at the option of E-ZY.NET, products may be returned either as repaired or replaced. If it is determined that there is no fault found (NFF) on a unit within warranty, the customer will be charged \$75 USD for testing time. For products out of warranty, the standard NFF charge is \$200. This charge will be at the discretion of E-ZY.NET. The RMA number is valid for 14 days from date of issue. The product must be received by the repair depot within these 14-days or the shipment may be refused.

## **Shipping and Damage Claims**

All shipping damage claims are the purchaser's responsibility. Inspect each shipment upon delivery and IMMEDIATELY report all damage, to the carrier. There may be time limits and inspections may be required.