



Now with  
TyconOS™ Firmware

## EZ-Go® +

*High Performance 802.11 Wireless Bridge/Router*

- Achieve up to 100 Mbit/sec speed
- Link up to 3 miles with good line of sight
- Best security available (WPA)
- Field Proven Wireless Technology





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

When following the instructions in this guide to install the antenna 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 antenna 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, Screws and screwdriver if mounting to a wall. **NOTE:** You should be familiar with using tools such as these before attempting installation of the antenna. You should be comfortable with working on a ladder.

**Note:** We highly recommend connecting the EZ-Go® power supply to a surge protected outlet or an Uninterruptable Power Supply system. We also recommend using shielded and grounded CAT5/6 cable between the antenna and the PoE Inserter. This will help prevent damage from lightning and electrical surges caused by lightning.



## **Getting Started**

We strongly recommend that you setup the EZ-Go® unit in your office room to get acquainted with the operation of the units before installing outdoors.

**CAUTION:** Applying a voltage higher than 24V will damage the unit and void the warranty. Do not plug the antenna directly into a standard PoE Switch because 99.9% of PoE switches are 48V.

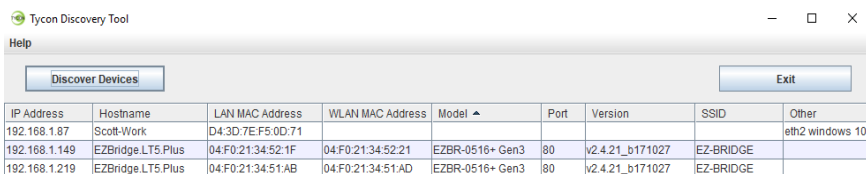
**CAUTION:** Do not plug/unplug the CAT5/6 cable to the antenna with power applied (hot swapping) as this could damage the unit. Always plug cable first and then apply power to the PoE inserter. Always disconnect power from the PoE inserter before disconnecting cables.

The EZ-Go<sup>®</sup> can be used to extend an EZ-Bridge<sup>®</sup> system to service more than 1 client location. Example: If you have three or four or more buildings to connect. It can also be used as an Access Point, Client Bridge or Repeater but these instructions will highlight the EZ-Bridge<sup>®</sup> application.

Connect the EZ-Go<sup>®</sup> to your router, switch or computer.

Download the Discovery Tool from <https://tyconsystems.com/index.php/support/firmware/145-firmware> . Your computer will need to have Java installed to use the discovery tool. The tool is cross platform and runs on Windows and MAC and Linux with Java installed.

After powering up the unit and waiting until you hear two beeps, run the discovery tool on a connected computer. The tool should be able to find the EZ-Go<sup>®</sup> unit. It will show as EZ-Bridge-LTxPlus.



In the example above the number that says “computer” (192.168.1.87) is the IP address for the computer that opened the Discovery Tool. To access the EZ-Go<sup>®</sup>, your computer IP address must be on the same subnet ie; 192.168.1.xxx. In the example above “.87 “ replaces “.xxx”. If your computer is not on the same subnet as the EZ-Go<sup>®</sup> unit you will either need to change the IP address of your computer or the EZ-Go<sup>®</sup> .

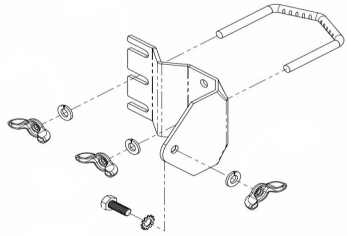
The unit ships from the factory with DHCP enabled so it should get its IP address from your router. If it can't get an IP address from the router it will default to 192.168.1.239.


Before you install the unit outdoors it is important to be sure that you can login to the antenna. Default username is “EZTEAM” and default password is “link4me”. Both are case sensitive.

We recommend that once you are comfortable that the unit is working properly, that you set the units IP address on a unique static IP so you can always find the EZ-Go<sup>®</sup> on your network. The IP address setting can be changed at NETWORK | INTERFACES | EDIT LAN | PROTOCOL

# Qwik Install

**STEP 1:** Choose a mounting location with good line of sight to the remote location. The supplied bracket can be mounted to a wall or to an existing pole up to 2" diameter. If only really short distances are needed, the antenna can be mounted inside a building.




 **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. 2.4GHz is more forgiving than 5GHz.*

**STEP 2:** Mount the Bracket:

To mount to a wall: The supplied u-bolt is not used and the bracket is screwed directly to a wall using customer supplied screws. To mount to a pole: Use the supplied U-Bolt and wing nuts. Make sure to use a lock washer at each wing nut. Tighten wing nuts evenly by hand. Use pliers if additional tightness is needed.



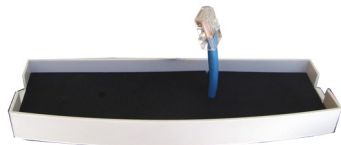
**STEP 3:** Mount the antenna housing to the bracket. Put the hex head bolt thru the housing back fin. Put the star lock washer so it is between plastic housing and metal bracket. Install wing nut with lock washer. Adjust desired tilt angle and tighten wing nut. Use pliers if additional tightness is needed.

 **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 4:** Remove the antenna bottom cover by using a coin or house key or screwdriver to push in one of the side snaps and then remove the cover.



**STEP 5:** Route a CAT5/6 cable through the bottom cover and plug into the RJ45 jack farthest from the LED's. Keep the black gasket material in the bottom of the cover to help keep out dust and insects.



**STEP 6:** Route CAT5/6 cable from the antenna into the building. Always create a strain relief near the antenna so the cable is not pulling directly on the antenna. Use the CAT5/6 strain relief hook feature built into the housing back fin. The Ethernet spec allows for a maximum cable length of 100 meters or about 328 feet.

**STEP 7:** Connect a CAT5/6 cable from your computer, switch or router to the LAN port on the desktop PoE inserter. Connect the CAT5/6 from the antenna to the POE port on the desktop PoE inserter. Plug the desktop PoE inserter into a surge protected AC power source to power up the EZ-Go<sup>®</sup>. NOTE: The EZ-Go<sup>®</sup> LT+ will operate from 12V to 24V.



**CAUTION:** Applying a voltage higher than 24V will damage the unit and void the warranty. Do not plug the antenna directly into a standard Active PoE port which may operate at voltages of 48V or higher.

## Software Settings

1. There is an HTML management system built into every EZ-Go<sup>®</sup> unit which is accessed thru a standard web browser. The unit can communicate thru the CAT5/6 Ethernet cable connection or thru the wireless bridge connection, so you can manage remote units from a single location.

**NOTE:** The device will usually go into a 1-2 minute reboot cycle when clicking on **SAVE & APPLY CHANGES**. During this time it will be unresponsive. The unit will beep once when it reboots and beep twice when it is ready.

2. **IP ADDRESS:** Default IP address for the EZ-Go<sup>®</sup> is 192.168.1.239. To access the EZ-Go<sup>®</sup>, your computer IP address must be on the same subnet ie; 192.168.1.xxx. The EZ-Go<sup>®</sup> ships with DHCP client enabled so if the unit has access to your network it will get its IP address automatically from your network. To find the units IP address use the Discovery Tool. We recommend after everything is working to your satisfaction that you assign a unique static IP to the unit so you always know how to access the units on your network. The IP address setting can be changed at NETWORK | INTERFACES | EDIT LAN | PROTOCOL

3. **CHANNELS:** The default channel is set to AUTO. The EZ-Go<sup>®</sup> client unit will automatically find the channel of the connected AP if the SSID (ie; "EZ-Bridge") and Wireless encryption settings are the same on AP and Client. Also on the AP if Mac Address Verification is turned on, it must be disabled or the new client MAC address needs to be in the allowed list.

4. **SECURITY:** Security is pre-configured with system passwords and WPA2 encryption pre-set. This is so that you can setup a link to an ex-

isting EZ-Bridge<sup>®</sup> unit more easily. Once you feel comfortable with the system and its operation, we would recommend the following security changes :

- a. **PASSWORD:** Change the password on all units by going to SYSTEM | ADMINISTRATION and re-setting the radio password. The default password = **link4me**. *The user name, **EZ-TEAM**, cannot be changed.*
- b. **ENCRYPTION:** Change the WPA2 encryption key by going to NETWORK | WIFI | EDIT | INTERFACE CONFIGURATION WIRELESS SECURITY | KEY .



**TECH TIP:** *When setting encryption you must setup all units to have identical encryption keys. You can setup the remote units first and then the local unit last in order to be able to configure all units from one location across the wireless link. Keys can use any ASCII characters. The more random the key, the more secure the code.*

5. **TRANSMIT POWER (Tx Power):** Normally there wouldn't be any reason to change the power setting. The factory default setting is **MAX**, 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. 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. The best performance will be seen with signal strength of -40 to -60dBm. This signal strength can be viewed on the STATUS | OVERVIEW page. To change the Tx power go to NETWORK | WIFI | EDIT | TRANSMIT POWER.

**NOTE:** We recommend if changing power, start by cutting it in half, check signal levels and then adjust to fall within the -40dBm to -60dBm range.



**TECH TIP:** *You may want to play around with different settings to see what works best for your particular link.*

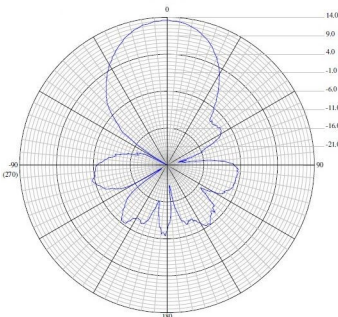
6. **SITE SURVEY:** The site survey is a very useful tool to determine what wireless devices are within range of your EZ-Go<sup>®</sup> and could be a source of interference that could cause degraded performance. Go to NETWORK | WIFI and then click on SCAN or SPECTRUM. The list will show information on all wireless devices within the range of the EZ-Go<sup>®</sup> . It will also allow you to connect the client to an existing AP.

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 SYSTEM | BACKUP/FLASH FIRMWARE | PERFORM RESET. Any customized settings will be lost once this process is initiated.

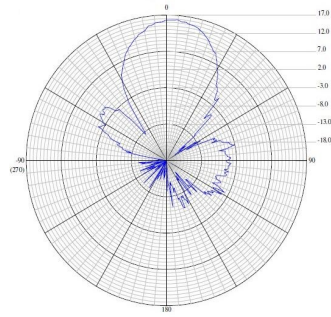
# Technical Specifications

Note: Subject to Change Without Notice

	2.4GHz	5GHz
<b>Standards</b>	802.11g/n	802.11a/n
<b>Certifications</b>	FCC / CE	
<b>Radio Specifications</b>		
<b>Operating Frequency</b>	2400 to 2497MHz	4900 to 6000MHz
<b>Available Transmit Power</b>	10 to 316mW	10 to 316mW
<b>Receive Sensitivity</b>	802.11g -75dBm 802.11n -90dBm	802.11a -75dBm 802.11n -90dBm
<b>Security</b>	64/128bit WEP, WPA, WPA2	
<b>Remote Configuration</b>	By IP Address; thru Wireless or Ethernet	
<b>Antenna Specifications</b>		
<b>Antenna Gain</b>	14 dBi	16 dBi
<b>Antenna Beamwidth (H/V)</b>	35 deg	27 deg
<b>Antenna Front to Back</b>	>20dB	>22dB
<b>Polarization</b>	MIMO	MIMO
<b>PoE Specification</b>		
<b>Power Over Ethernet</b>	INPUT: 100 – 240VAC @ 50 – 60Hz OUTPUT: 24VDC @ 0.5A Average Power Consumption 4W	
<b>Mechanical Specifications</b>		
<b>Color</b>	White	
<b>Dimensions (L x W x H)</b>	12.4" x 7.3" x 2.5" (314 x 187x 65mm)	
<b>System Weight</b>	7 lb (3 kg)	
<b>Ethernet Connector</b>	RJ45	
<b>Mount</b>	Pole (up to 2" dia) or Wall	
<b>Environmental Specifications</b>		
<b>Operating Temperature</b>	-22 to 158 Deg F (-30 to +70 Deg C)	
<b>Humidity</b>	0 to 100% RH	
<b>Wind Loading (125MPH survivability)</b>	100MPH / 23lbs; 125MPH / 35lbs	



2.4GHz



5GHz

If you cannot access the web based (control panel) on the unit you can do a manual reset. Remove bottom cover of unit. Power up the unit, wait 2-3 mins or until you hear two beeps, then press and hold the black reset button for 15secs, release and wait 2-3 mins for reboot. Power cycle the unit.

Pressing the reset button momentarily will reboot the device.

8. **UPGRADE FIRMWARE:** For the latest firmware point your browser to <https://tyconsystems.com/index.php/support/firmware/145-firmware> . Download the latest firmware to your PC. Go to SYSTEM | BACKUP/ FLASH FIRMWARE | FLASH NEW FIRMWARE | CHOOSE FILE and then browse for the new file, then click FLASH NEW FIRMWARE. The update process takes about 4 minutes. You will hear 1 beep when the unit reboots and two beeps when the unit is ready.

9. **CHANGING OPERATING MODE:** The EZ-Go<sup>®</sup> can be changed to an Access Point device on the NETWORK | WIFI | EDIT | INTERFACE CONFIGURATION | MODE page. You might change a unit to AP if you wanted to use the unit as an access point talking to multiple clients. We recommend using Access Point (WDS) and Station (WDS) in most cases to maintain the highest level of network transparency.

10. **AUTOMATIC REBOOT:** We highly recommend setting up an automated reboot to reboot units every night during the wee hours when the link is not being used. This will ensure that the units run smoothly without need for intervention because it clears memory and corrects issues like corrupted flash. Go to SYSTEM | SERVICES | AUTO REBOOT. Set the AP to reboot first and the station to reboot about 5 minutes later.

## *Advanced Features*

Since documentation for the advanced features is too extensive to cover here please visit our online wiki at <https://tyconsystems.com/index.php/support?view=kb&kbartid=2>



# TECH CORNER

## *Additional Information you may find useful*

1. **TROUBLESHOOTING –Link Down–** If a link goes down the first thing to do is run the discovery tool from both sides of the network. The discovery tool should be able to discover all units from each side of the link. If it can see the local unit but not the remote unit then the wireless link is down or the remote unit is down. Run the discovery tool on the remote side. If it can see the remote unit then the wireless link is down. Reset both units to factory defaults and power cycle them. If it cannot see the remote unit from the remote side, bring the power supply and PoE Inserter cable from the working side and see if that fixes the problem. Also check your cables.

2. **TROUBLESHOOTING—Poor Performance–** If you are seeing poor performance, power cycle both units then after about 10 minutes check the signal strength on the status page of the web based control panel. If signal strength is between  $-76$  and  $-90$ dBm the signal level is abnormally low and could be because the antennas have lost their physical alignment. Check the alignment. Antennas are more sensitive to vertical tilt than horizontal. Next, make sure there haven't been any changes to line of site like new trees or buildings or vehicles. Line of site issues can usually be helped by moving the antenna to a new location with better line of site. If signal level is good (between  $-35$  and  $-75$ dBm) try changing the wireless channel on the AP unit. You should also do a site survey on both units to see what channels are already being used. Select a channel that is not already used or one that has a very low signal strength.

If the signal level is too hot,  $-30$ dBm, because the units are very close, you should turn down the transmit power on both units.

3. **RAIN, SNOW, ICE –** The frequencies being used by the EZ-Go<sup>®</sup> + 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 ( $>1$  miles) 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.

4. **SUN AND HEAT–** The EZ-Go<sup>®</sup> 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 158 deg F ambient temperature. Even though the EZ-Go<sup>®</sup> 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.

5. **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-Go<sup>®</sup> unit to ensure proper grounding of the electronics inside the enclosure to prevent damage from electrical storms. 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. Shielded CAT5/6 cable is also recommended between the PoE Inserter and antenna.

6. **PAINTING** – The EZ-Go<sup>®</sup> 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-Go<sup>®</sup>. 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-Go<sup>®</sup> supports all VOIP standards making it possible to use VOIP phones across any EZ-Go<sup>®</sup> link.

## Status Overview Screen Tour

The overview screens shown on the AP and Station are a bit different. For simplicity we will concentrate on the AP screen:


- A. **Wireless Section** - This section shows the wireless interface. Here you can see the ESSID, the operating mode of this unit (Master = Access Point), the wireless channel that the unit is operating on, the negotiated bitrate (should be 300), the BSSID which on the AP is the MAC address of the AP, and the wireless encryption type that is being used.

### Wireless

<b>QCA9531 802.11bgn Radio</b>	<b>SSID:</b> EZ-BRIDGE1	<b>Encryption:</b> WPA2 PSK (AUTO)
	<b>Mode:</b> Master-WDS	<b>ACK Timeout:</b> 23
	<b>Channel:</b> 6 (2.437 GHz)	<b>DFS Status:</b> Disabled
	<b>Bitrate:</b> 300 Mbit/s	
	<b>BSSID:</b> 04:F0:21:37:B3:9B	

- B. **Associated Stations** - This section shows the stations that are communicating with this Access Point. It provides information about the station; MAC Address, Network or ESSID, Signal level being received from the station, noise level, negotiated TX and RX rates, and Transmit CCQ (TX-CCQ) which is a measure of signal quality (good is >80)

### Associated Stations ()

MAC-Address	Network	Device Name	Last IP	Signal	Signal/Chains	Noise	TX Rate	RX Rate	TX-CCQ
 04:F0:21:37:B3:FF	EZ-BRIDGE1	EZBridge_LT2.Plus		-75 dBm	-76,-81 dBm	-95 dBm	117.0 Mbit/s	105.5 Mbit/s	86 %

- C. **System Section** – Shows information about the unit. Router Name = Host Name (this can be changed on the SYSTEM | SYSTEM page), router model, firmware version, bootloader kernel version and Local Time (Time settings can be changed on the SYSTEM | SYSTEM page)

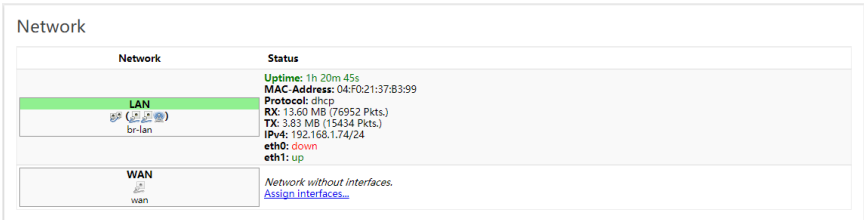
### System

<b>Router Name</b>	EZBridge_LT2.Plus.AP
<b>Router Model</b>	EZBR-0214+ Gen3
<b>Firmware Version</b>	TyconOS v2.421_b171027
<b>Kernel Version</b>	3.3.8
<b>Local Time</b>	Tue Dec 12 07:49:37 2017

- D. **Memory** - Shows total available memory and total free memory. If free memory is showing near zero, you need to reboot the unit to clear memory.

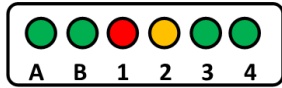
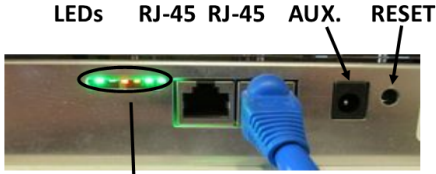


- E. **Network Section** - Shows information about the LAN and WAN interfaces. The WAN interface is only active if the unit is configured as a router



## NOTES

# Explanation of LEDs and Connections



**Aux. Power Port** - ( Range 12 – 24 VDC)

Can be used to power the Antenna or feed out to another device. VDC out is equal to PoE in.

**Reset** - Used for rebooting or firmware changes.

**Restart** - Hold for 1 Second





**Factory Default** - Hold for 15 Seconds



**WIPE** - Caution, holding for more than 40 Seconds will delete all installed firmware.



 **A. Power on Indicator** - Light is GREEN when connected to power source.


 **B. Ethernet Indicator** - Light is flashing GREEN during active communication between antennas

**1 2 3 4** LEDs 1 through 4 perform as a Signal Strength Meter. All 4 on indicates best signal.

    Excellent - Above -55 dBm

   Good - Above -65dBm

  Okay - Above -75dBm

 Poor - Above -85dBm

Note: Signal Strength values may be user adjusted within the web interface under System -> LED Configuration (Defaults shown above)

## NOTES

## 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 EZ-Go® products are supplied with limited 24 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 Tycon Systems®. Tycon Systems® 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 Tycon Systems®. Provided the goods have not been modified or repair attempted by someone other than Tycon Systems®, at the option of Tycon Systems®, 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 Tycon Systems®. 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.

Phone: 801-432-0003  
support@tyconsystems.com

## NOTES