

# TRANZEO WIRELESS QUICK START GUIDE

## FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital devices pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication.

Operation of this equipment in residential area is likely to cause harmful interference in which case the user will be required to correct the interference at this own expense.

The user should not modify or change this equipment without written approval from company name. Modification could void authority to use this equipment.

For the safety reason, people should not work in a situation which RF Exposure limits be exceeded. To prevent the situation happening, people who work with the antenna should be aware of the following rules

1. Install the antenna in a location where a distance of 32.5 cm from the antenna may be maintained.
2. While installing the antenna in the location, please do not turn on the power of wireless card.
3. While the device is working, please do not contact the antenna.
4. RF exposure: The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter”

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## About This Manual

The purpose of this manual is for the setup of the TRANZEO TR-CPE200. This manual, revised as version 1.0.0 in 2004, includes procedures assisting you in avoiding unforeseen problems.



# TRANZEO WIRELESS QUICK START GUIDE

## Introduction

This next-generation wireless LAN device – the TRANZEO TR-CPE200, brings Ethernet-like performance to the wireless realm. Fully compliant with the IEEE802.11b standard, the TRANZEO TR-CPE200 also provides powerful features such as the Internet-based configuration utility, and WEP security. Maximize network efficiency while minimizing your network investment and maintenance costs.

## Hardware Installation Product Kit

Before installation, make sure that you have the following items:

**The TR CPE200** x 1  
**DC Power Adapter** x 1  
**Power over Ethernet Adapter** x 1  
**Ethernet Boot** x 1  
**Ethernet Boot Tightening Bracket** x 1  
**Mounting Bracket** x 1  
**Ket Nuts (With Washer Attached)** x 8  
**U-Bolt w/ 2 Nuts** x 1  
**RJ-45 Patch Cable** x 1  
**Spare Ethernet Boot Gasket** x 1

If any of the above items is not included or damaged, please contact your local dealer for support.

## Mechanical Description

LED panel of the Wireless LAN Smart Access Point:

The following table provides an overview of each LED activity:

Label	Color	Indicators
POWER	Amber	<b>On:</b> Powered On <b>Off:</b> No Power
LAN	Amber/Green*	<b>On:</b> Ethernet Link <b>Flashing :</b> Ethernet Traffic <b>Off:</b> No Ethernet Link
Radio	Red	<b>On:</b> Radio Link <b>Flashing</b> Radio Activity <b>Off:</b> No Radio Link

\*Only one of the two colors will be shown. Actual color will vary between units.

**Power Supply:** ONLY use the power adapter supplied with the TR- CPE200. Otherwise, the product may be damaged.



# TRANZEO WIRELESS QUICK START GUIDE

## 2-4 Hardware Installations

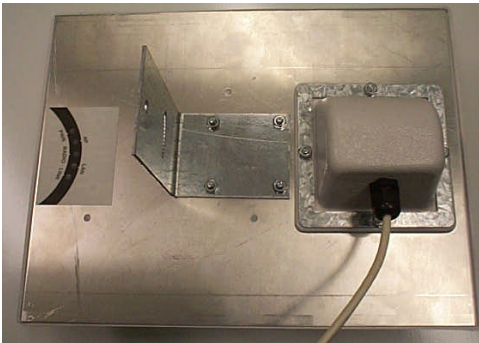
Take the following steps to set up your TR-CPE200.

**Site Selection:** Before installation, determine the TR-CPE200 Units location. Proper placement of the unit is critical to ensure optimum radio range and performance. You should perform a Site Survey to choose a proper placement for your unit. Place your unit within the line of sight of the Access Point. Obstructions may impede performance of the unit.

### Tools Required to Install

- One 3/8 wrench
- One RJ-45 Crimper
- A suitable length of Cat 5 Cable to bring the signal from the unit to the Power over Ethernet Adaptor
- RJ-45 Jacks

Before installing, you must determine if you will be installing the unit in a horizontal or vertical orientation. The TR-CPE200 model can be mounted in either orientation. The Ethernet boot should always be placed so that the cable runs toward the ground for maximum environmental protection.



Vertical Orientation

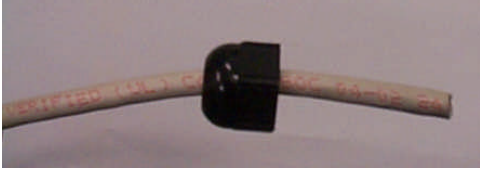


Horizontal Orientation

# TRANZEO WIRELESS QUICK START GUIDE

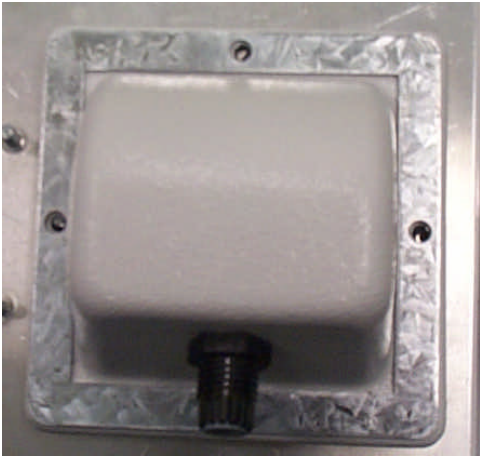
## Connecting the Ethernet Cable

### Step 1



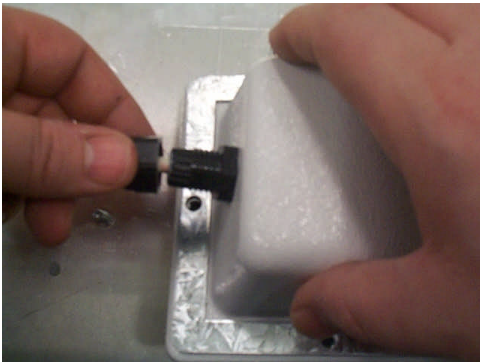
Place the Ethernet Boot Cover over the end of your Cat 5 Cable.

### Step 2



Attach tightening bracket on top of the Ethernet Boot. This is easiest to do before you attach the CAT 5 cable. The Gasket must be attached to the Boot so that it sits between the radio and the boot.

### Step 3

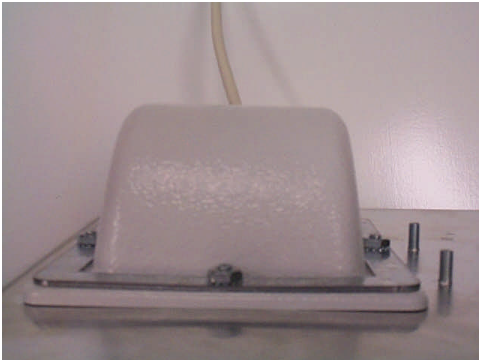


Insert the Cat 5 Cable and tighten the Boot Cover. Be sure to pull enough cable through to reach the RJ-45 connector with an RJ-45 jack attached.

Hand tighten only. **DO NOT OVERTIGHTEN** as you may damage the environment seal.

# TRANZEO WIRELESS QUICK START GUIDE

## Step 4

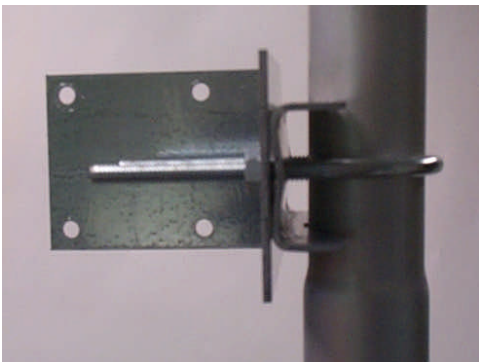


Place the Ethernet boot over the 4 Screw Posts. The screws should just barely clear the tightening bracket. Apply 4 Ket nuts to the screw posts and tighten until the metal plate makes full contact with the Ethernet boot. Do not over tighten.



This is an example of over tightening. Over tightening connections like this may crack the boot and will compromise the gasket seal. Over tightening is not covered by warranty.

## Attaching the Mounting Bracket



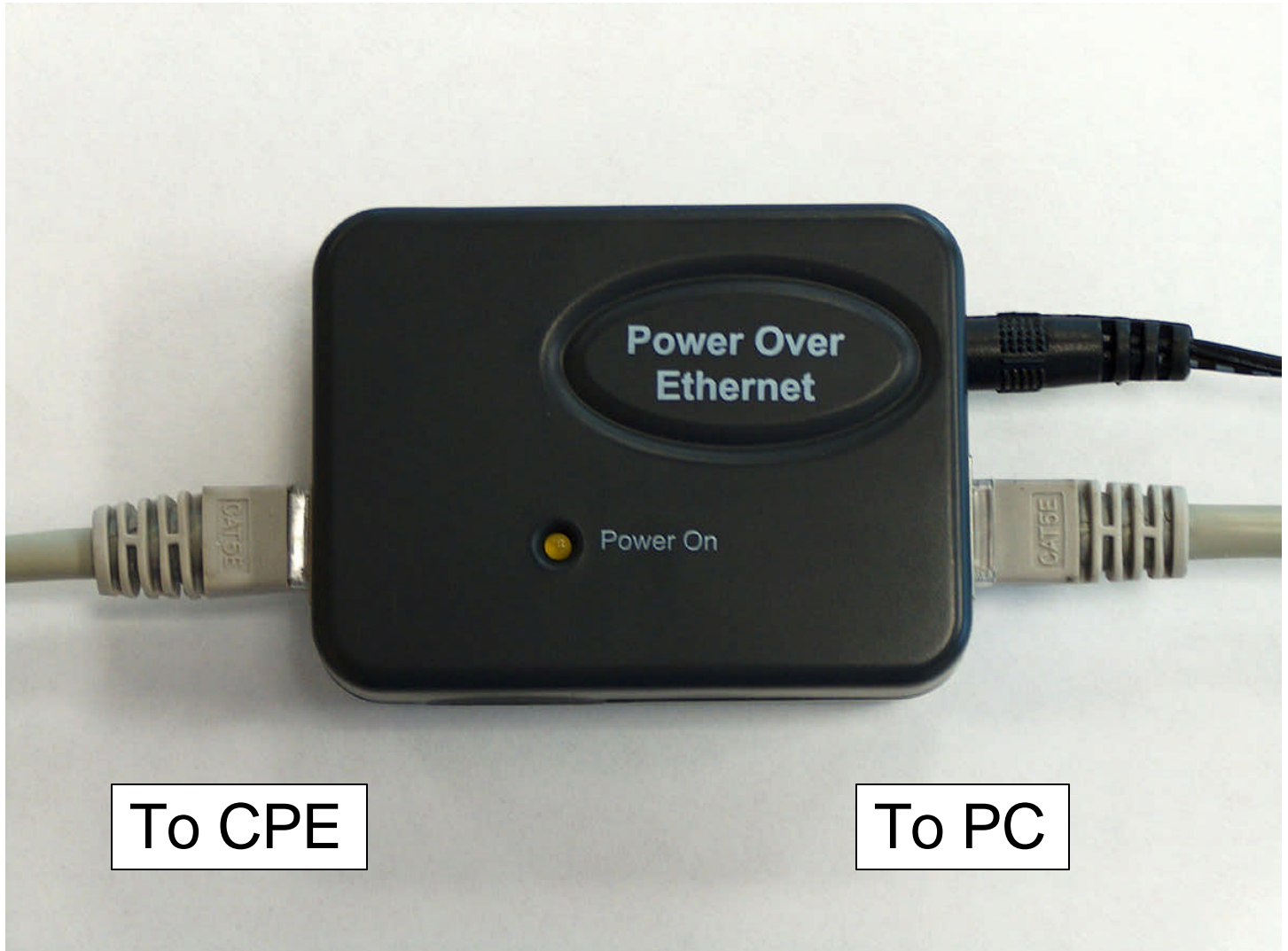
As shown below, the U-Bolt is designed to mount around a pole. Tighten bolts sufficiently to prevent any movement.

Down or up tilt can be adjusted by swinging the unit before tightening the U-Bolt.



# TRANZEO WIRELESS QUICK START GUIDE

## Connect the Power Cable



Connect the power adapter to the power socket on the Power over Ethernet Adaptor, and plug the other end of the power into an electrical outlet. Plug the RJ-45 Cable from the unit into the POE. The Station Adaptor will be powered on and the Red power indicator on the top panel will turn on.

**NOTE:** ONLY use the power adapter supplied with the Access Point. Otherwise, the product may be damaged.

# TRANZEO WIRELESS QUICK START GUIDE

## HTML Interface2

**NOTE:** The default IP address is 192.168.1.99

The screenshot shows the Tr-CPE2 web interface with the following sections and fields:

- System:**
  - User Name: admin
  - password: [masked]
  - again: [masked]
  - OS: 5.4.B.1.1248
  - Firmware: 1.51.R.1.1
  - Allow upgrades:  Upgrade
  - MAC Address: 00026F342F7B
  - Cloning bridge:
- IP Address:**
  - Mode:  Static  DHCP
  - IP address: 192.168.1.99
  - Subnet mask: 255.255.255.0
  - Gateway: 192.168.1.1
- Radio:**
  - Firmware: Primary 1.1.1, Secondary 1.8.0
  - MAC Address: 00026F342F7B
- Service Set:**
  - SSID: [empty]
  - Tx Rate: Automatic
  - Ad-Hoc  Infrastructure
  - Channel: 6
  - AP Density: High
- Parameters:**
  - RTS Threshold (0-3000): 2432
  - Fragmentation Threshold (256-2346): 2346
- Security:**
  - WEP:**
    - Enabled:
    - Key Length: 128 bit
    - Encrypted Data only:
    - Shared Key Authentication:
  - Keys:**
    - [Two empty input fields for keys]

Buttons at the bottom: Defaults, Apply, Undo, Reboot, Log Off, Performance.

## System Settings

Password	Allows user to change passwords.
Again	Confirm Password
Firmware	Lists Diagnostic Information about internal firmware
Allow Upgrades	Allows User to Change Firmware Version
Cloning Bridge	If selected, the CPE will use the MAC address of the device it is attached to



# TRANZEO WIRELESS QUICK START GUIDE

## IP Address

Mode	Select Static to enter a valid Static IP or select DHCP address for auto select.
IP Address	This field is Read Only if DHCP is selected
Subnet Mask	This field is Read Only if DHCP is selected
Gateway	This field is Read Only if DHCP is selected

## Radio

Firmware	Lists Diagnostic Information about internal firmware
MAC Address	Radio MAC Address

## Service Set

SSID	The SSID is a unique ID given to an Access Point. Wireless clients associating to the Access Point must have the same SSID. The SSID can have up to 32 characters.
TX Rate	The rate at which the radio will communicate with the AP. <b>NOTE:</b> Setting this rate below the maximum possible does not limit bandwidth, and often has a negative impact on the operation of your network.
Ad – Hoc / Infrastructure	Select Infrastructure for any WISP operation
Channel	Only applicable in Ad-Hoc Mode
AP Density	Best set to Low in most WISP applications
RTS Threshold (0-3000)	Select RTS that works best in your location. A general rule of thumb is the more clients you have, the lower the value should be set.
Fragmentation Threshold (256-2346)	Select Fragmentation that works best in your location. The lower the Fragmentation, the smaller the packets.

## Security

Enabled	Turn On WEP
Key Length	Level of Encryption. <b>NOTE:</b> 64 bit is called 40 bit on some systems
Encrypted Data only	Only Connect to a system if WEP is enabled
Shared Key Authentication	Turn on Shared Key Authentication
Keys	Enter your WEP keys. <b>NOTE:</b> Keys must be entered in HEX only.





# TRANZEO WIRELESS QUICK START GUIDE

## Buttons

- Default - Resets the Radio to factory Defaults
- Apply - Save Changes and reset Radio
- Undo - Clear any changes not applied
- Reboot - Reboot the radio
- Performance - Loads the test page

## Performance

The screenshot shows the 'Tr-CPE2 Performance' page in a Microsoft Internet Explorer browser window. The page is divided into several sections, each with a red border:

- Radio**: A table titled 'Available Access Points' with columns for MAC address, SSID, Channel, Capabilities, Signal, and Noise. The table contains one entry: MAC address 0060B303957F, SSID My Network, Channel 1, Capabilities AP, Signal 13, and Noise 0.
- Link**: A table with columns for Tx Rate, Adjust, Quality, Signal, and Noise. The values are: Tx Rate 5.5, Adjust 100, Quality 13, Signal -87, and Noise -100.
- System**: A table titled 'Switching Table' with columns for IP Address and MAC address. The values are: IP Address 192.168.1.100 and MAC address 0008A166039F.
- CPU**: A table with columns for Net Pages Free and Memory Free. The values are: Net Pages Free 19 and Memory Free 1222.

Shows all available Access Points using the SSID in this radio.  
**Hint: Leave the SSID field blank to see all APs in the area.**

Shows your current TX rate and the quality of the link. The signal level is in dbm.

Shows all MACS currently being bridged by the Radio with their IP's and Mac Address

Diagnostic Info about the Radio for Technical Support issues.

# TRANZEO WIRELESS QUICK START GUIDE

## RF Exposure Evaluation

FCC 1.1310 states that the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to RF radiation as specified in 1.1307(b)

Frequency Range (MHZ)	Electric Field Strength (V/m)	Magnetic Field Strength (A/M)	Power Density (mW/cm2)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

## Fries Formula

Fries transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$  Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW.

$G$  = gain of antenna in the direction of interest relative to an isotropic radiator.

$R$  = the distance between the observation point and the center of the radiator in cm.

$P_d$  is the limit of MPE, 1mW/cm<sup>2</sup>.

If we know the maximum gain of the antenna and the total power input to the antenna we can calculate the distance  $r$  where the MPE limit is reached.

## RF exposure evaluation distance calculation

TR-CPE200-19

Chan	Freq (MHz)	Output Power to Antenna (dBm)	Output Power to Antenna (mW)	Max Antenna Gain (dBi)	Numeric Antenna Gain	R(cm)
1	2412	21.06	128	19.5	89.1	30.1
6	2437	21.34	136	19.5	89.1	31.1
11	2462	21.74	149	19.5	89.1	32.5

TR-CPE200-15

Chan	Freq (MHz)	Output Power to Antenna (dBm)	Output Power to Antenna (mW)	Max Antenna Gain (dBi)	Numeric Antenna Gain	R(cm)
1	2412	21.06	128	15.5	35.5	19.0
6	2437	21.34	136	15.5	35.5	19.6
11	2462	21.74	149	15.5	35.5	20.5

As shown above, the minimum distance where the MPE limit is reached is 32.5 cm for the TR-CPE200 product family.

