

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



KarlNet Inc.

*Networking your
Wireless World*

KarlNet Residential Subscriber Unit (RSU) Setup and Installation Manual



Residential Subscriber Unit (Model Number RSU-01101)

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



TABLE OF CONTENTS

TABLE OF CONTENTS.....	2
FCC NOTICE	Error! Bookmark not defined.
WARRANTY	3
PRODUCT DESCRIPTION.....	4
THEORY OF OPERATIONS	7
FEATURES	8
Hardware/Environmental Features	8
INSTALLATION	9
Mount the Unit.....	10
General Mounting Considerations	10
Power up the Unit	11
Configure the Unit	12
CONTACT.....	14

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



FCC Declaration of Conformity

Responsible party:

KarlNet, Inc.
525 Metro Place N., Suite 100
Dublin, OH 43017
(614) 822 – 5275 Fax: (614) 822 - 2400

We, KarlNet, Inc. declare that the wireless networking equipment described herein :

- (1) Compleis with FCC radiation exposure limits set forth for an uncontrolled environment when installed as directed.
- (2) Meets Class B emission requirements and complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
 - This device may not cause harmful interference.
 - This device must accept any interference received, including interference that may cause undesired operation.

FCC Notice

This equipment should be professionally installed, and the installer is responsible for ensuring that the system is used exclusively for fixed point-to-multipoint operations. The equipment should be installed and operated as fix-mounted antennas such that the main lobe(s) of these antennas are located a minimum of 2 meters between the antenna and all persons during normal operation. Users and installers must adhere to the antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance set forth under Part 15 of the FCC regulations. Failure to do so, or changing/modifying the unit may void the user's authority to operate the equipment.

© 2004 KarlNet, Inc. All Rights Reserved. No part of parts of this document may be reproduced, translated, stored in any electronic retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopied, recorded or otherwise, without the prior written permission of KarlNet, Inc.

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



WARRANTY

KarlNet, Inc. warrants that your device is free of defects in material and workmanship for a period of one year after initial purchase. KarlNet will, in this period of time, repair or replace, any KarlNet product returned to the factory, freight prepaid.

The KarlNet warranty covers repairs or replacement (at KarlNet's option) of the product only. KarlNet is not responsible for the cost of removal, reinstallation, or shipping to the place of repair. KarlNet does not extend or modify its warranty period as a result of repair or replacement.

KarlNet reserves the right to void a warranty and/or make reasonable charges for repair of a unit if the warranty seal is broken or the unit displays evidence of misuse, abuse, or tampering.

KarlNet is not responsible for damage to any other equipment or property, or any other consequential or incidental damages of any kind, whether based on contract, negligence, or strict liability. Maximum liability shall not in any case exceed the purchase price of the unit.

Warranties give you (the buyer) specific legal rights. You may also have other rights that vary from state to state. This warranty is only extended to purchases made in the United States of America or its possessions.

SPECIAL WARRANTY NOTICE

The system warranty is null and void if any of the following occurs:

1. The product enclosure is opened.
2. The system connections are not properly waterproofed.
3. The device is installed improperly or with incorrect connectors.
4. The antenna or DC Power Injector are physically damaged.
5. The device is operated outside the recommended DC power specifications.
6. The device is damaged by extreme forces of nature, lightning, or 'Acts of God.'

PRODUCT DESCRIPTION

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



Thank you for purchasing KarlNet's Residential Subscriber Unit (RSU) outdoor wireless networking device. This guide explains how to install the hardware device, provides power and cabling guidelines, and instructions on how to configure the RSU software.

The TurboCell Integrated Residential Subscriber Unit (RSU) is a powerful FCC approved unit that offers the lowest entry price into the point-to-multipoint outdoor wireless market. The RSU is designed for the residential market, and is the client side of a wireless point-to-multipoint network. The RSU supports 1 to 5 wired users. The RSU is designed as a cost-optimized solution, and features a basic software suite. This all-in-one unit features KarlNet's advanced chipset, embedded 19 dBi antenna, 2.4 GHz radio, and KarlNet's award-winning industry standard TurboCell™ software. Because of its outstanding feature set and affordable price, the RSU offers the best value in the outdoor wireless industry. It also supports your existing TurboCell installations, saving you the need to reinvest in costly software.

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



PACKING LIST

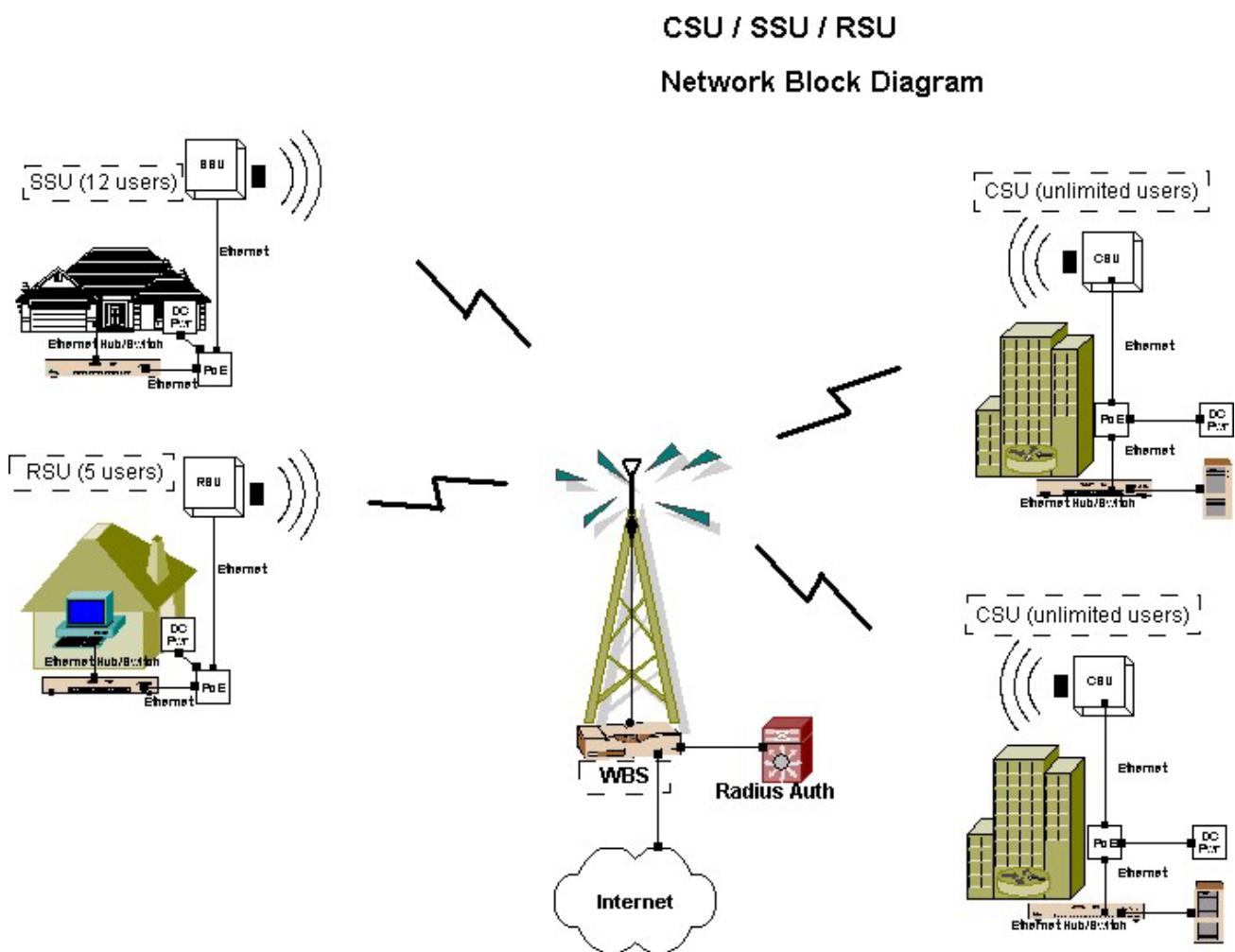
Your package contains the following items:

- A KarlNet Residential Subscriber Unit (RSU) and associated mounting bracket
- A Power over Ethernet (PoE) Injector
- A DC power supply
- An Ethernet coupler
- A “Getting Started” CD that contains various documents.

Note: You will need to provide (and possibly customize) an Ethernet extension cable (CAT5E or better).

THEORY OF OPERATIONS

The RSU is part of KarlNet's suite of Customer Premise Equipment (CPE) Outdoor wireless devices. These devices are used as remote stations that connect to a base station or repeater, and are used in both point-to-point and point-to-multipoint networks. They provide low-cost, easy-to-install solutions for small office or large business locations. The following diagram illustrates how KarlNet's CPE outdoor devices are used within the wireless network.



525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



FEATURES

Software Features

Users Supported – 1 to 5
Bridging
Password-based Security
Adaptive Dynamic Polling¹
Bandwidth Control/Data Rate Throttling¹
Superpacket Aggregation¹
Solution for Hidden Node Problem¹
Continuous Signal Quality Monitoring
Supports TurboCell or 802.11 protocols

Hardware/Environmental Features

10baseT Ethernet
Accepts DC power or Power over Ethernet (PoE) at 12 to 48VDC
Temperature Sense and Reporting
Reload Factory Defaults Pushbutton (requires opening the unit)
Hardware Watchdog Timer
Antenna – 19 dBi – Flat panel with integrated antenna
Frequency – 2.4 GHz
Operating Temperatures : -30° C to +55° C (-22° F to 131° F)²
Humidity: 90%
FCC Class B
FCC Part 15 Certified
Coverage Range – Up to 6 miles
Continuous Signal Quality Monitoring

¹ TurboCell models of the RSU only.

² The temperature range refers to the ambient temperature inside the case. This assumes a vertical orientation for the board, with natural convection only. Please refer to the System Integration Guide for more details.

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



INSTALLATION

Follow the steps below to install your KarlNet CPE Outdoor wireless device:

1. [Mount the unit.](#)
2. [Power up the unit.](#)
3. [Configure the unit.](#)

Each step is described in more detail below.

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



Mount the Unit

Each RSU unit ships with a mounting bracket and associated hardware that can be used to mount the unit on a pole. The bracket should be used on poles that support standard U-mounts (2.5" in diameter). You can use other mounting brackets at your own discretion.

General Mounting Considerations

- Mount the RSU to a secured pole in the shade, with unobstructed line of sight to the Wireless Base Station (WBS).
- Stainless steel hose-clamps, or any suitable equivalent, may be used to secure the unit to the mast.
- Leave the unit mounting loose enough to allow for movement when performing the alignment/testing procedure. The unit should be tightened only after the alignment/testing procedure is completed.

Power up the Unit

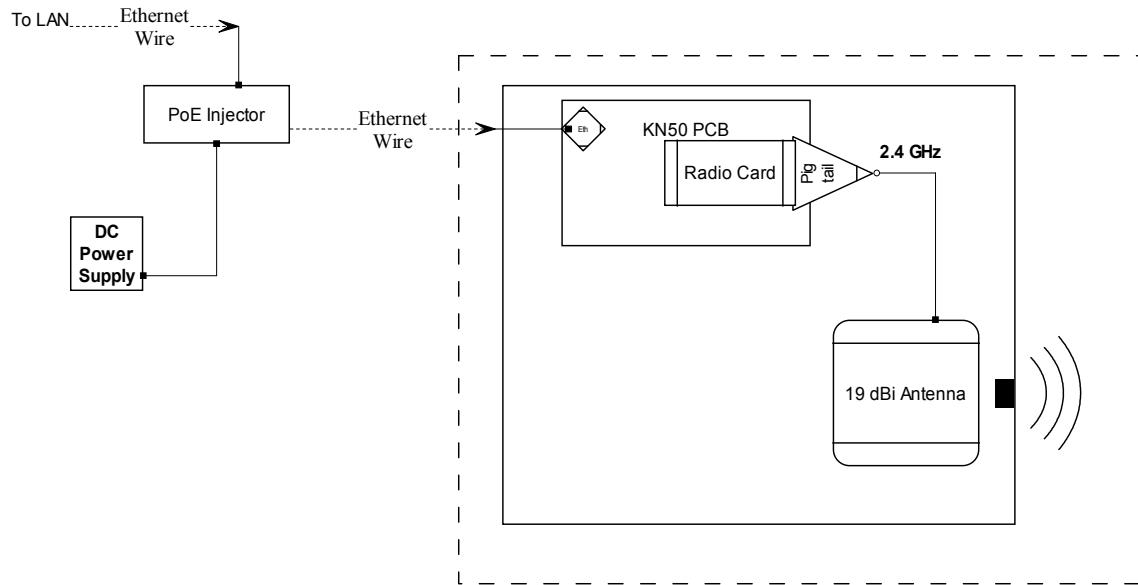
Power for the RSU is provided through a PoE Injector and a DC power wall-wart (included with unit).

To power the unit:

1. Run a straight Ethernet coupler and an Ethernet wire to an indoor wall outlet to the PoE injector and DC power supply (both included with your RSU unit).
2. Connect the Ethernet cable to the unit at location “ODU” (OutDoor Unit) on the PoE injector.
3. Connect a straight Ethernet cable from the “NET” location on the PoE injector to a hub or switch.

Note: The Ethernet to Ethernet connection at the cable end should be water sealed or shielded from rain/snow.

The following diagram illustrates the basic power configuration.



KarlNet CPE Outdoor products operate with the included Power over Ethernet (PoE) injector. When planning an installation using PoE, it is important to consider the power requirements of the CPE Outdoor system and the length of the Ethernet cable that will carry the power.

Configure the Unit

1. Assure that your PC is in the same **IP subnet** as that of the RSU.
2. Open your Internet browser.
3. In the Address field, enter the IP address for your RSU as example shown :
<http://10.0.1.210>
then press <Enter>. Note that 10.0.1.210 is the **default** IP address of a new unit. If your unit was reconfigured, then use the configured IP address.
4. The Enter Network Password screen is displayed, as shown below.



- A. Enter the default User Name login of “admin” and the default password of “public,” then click the OK button. Your web browser opens, and the “Welcome to the RSU Configurator” opening screen is displayed, as shown in the screenshot below

Note: Some units may use “karlnet” as the default User Name login.

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



Welcome to the RSU Configurator

The Residential Subscriber Unit (RSU) Configurator is used to set up the network connections for the customer premise equipment (CPE) connected to your network, and to monitor the status of your network.

- Select the Network Statistics/Information option if you are interested in viewing network status information such as signal levels, number of packets received, and so on.
- Select the Network Administration/Configuration option to set up configuration options for the hardware devices on your network. Note that you will need a network username and password to access the network configuration and administration screens.

[Network Statistics/Information](#)

[Network Configuration/Administration](#)

5. Follow the on-screen instructions to configure your network.

525 Metro Place North, Suite 100
Dublin, OH 43017
Office: 614-822-5275
Fax: 614-822-0024
www.KarlNet.com



CONTACT

KarlNet, Inc.
525 Metro Place N., Suite 100
Dublin, OH 43017
Office: (614) 822 – 5275 x131
Fax: (614) 822 – 0024
Email: sales@KarlNet.com
Web: <http://www.KarlNet.com>