

Preface

About this Guide

This document provides a complete overview of the **WaveRider** NCL1170 bridge/router, including system features, network planning, and procedures for implementing, installing, operating, and troubleshooting this device.

Before proceeding, we recommend that you read the following sections:

- *Software License Agreement* on page ii
- *Warranty* on page iv
- *Regulatory Notices* on page x
- *Warnings and Advisories* on page xii

Regulatory Notices

This device has been designed to operate with several different antenna types. Each antenna type shall not exceed the maximum antenna system gain as given in the following table. Antennas having a higher gain are strictly prohibited by Industry Canada and FCC regulations. The required antenna impedance is 50 ohms.

Table 1 Maximum Antenna System Gain

Antenna Type	Maximum Antenna System Gain
Omni	9.0 dBi
Patch	10.6 dBi
Yagi	10.1 dBi
Dish	20.5 dBi

NOTE: For a Dish antenna a cavity filter with a minimum rejection of 20 dB, ± 22 MHz from the channel center frequency is required.

Industry Canada

The NCL1170 complies with IC RSS-210.

Operators must be familiar with IC RSS-210 and RSS-102.

The IC certification number for the NCL1170 is "pending".



WARNING!

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

Federal Communications Commission

The NCL1170 complies with FCC Part 15 Regulations.

The FCC ID for the NCL1170 is OOX-WRM2000.

The transmitter of this device complies with Part 15.247 of the FCC Rules.



WARNING!

Operators must be familiar with the requirements of the FCC Part 15 Regulations prior to operating any link using this equipment. For installations outside the United States, contact local authorities for applicable regulations.

Interference Environment

Manufacturers and operators of spread-spectrum devices are reminded that the operation of these devices is subject to the conditions that:

- Any received interference, including interference from industrial, scientific, and medical (ISM) operations, must be accepted; and
- These devices are not permitted to cause harmful interference to other radio services.

If the operation of these systems does cause harmful interference, the operator of the spread-spectrum system must correct the interference problem, even if such correction requires the Part 15 transmitter to cease operation. The FCC does not exempt spread-spectrum devices from this latter requirement regardless of the application. The FCC strongly recommends that utilities, cellular stations, public safety services, government agencies, and others that provide critical communication services exercise due caution to determine if there are any nearby radio services that can be affected by their communications.

Operational Requirements

In accordance with the FCC Part 15 regulations:

1. The maximum peak power output of the intentional radiator shall not exceed one (1) watt for all spread-spectrum systems operating in the 2.4000-2.4835 GHz band.
2. Systems operating in the 2.4000-2.4835 GHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi, provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.
3. Stations operating in the 2.4000-2.4835 GHz band that are used for fixed, point-to-multipoint operations may use transmitting antennas of directional gain greater than 6 dBi, provided the peak output power from the intentional radiator is reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
4. Fixed, point-to-point operation, as used in Point 2, excludes the use of point-to-multipoint systems, omni-directional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread-spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations.
5. The operator of a spread-spectrum system is responsible for ensuring that the system is operated in the manner outlined in *Interference Environment* on page xi.

Warnings and Advisories

General Advisory

Operator and maintenance personnel must be familiar with the related safety requirements before they attempt to install or operate the NCL1170 equipment.

It is the responsibility of the operator to ensure that the public is not exposed to excessive Radio Frequency (RF) levels. The applicable regulations can be obtained from local authorities.



WARNING!

This system must be professionally installed. Antennas and associated transmission cable must be installed by qualified personnel. WaveRider assumes no liability for failure to adhere to this recommendation or to recognized general safety precautions.



WARNING!

To comply with FCC RF exposure limits, the antenna for this transmitter must be fix-mounted on outdoor permanent structures to provide a separation distance of 2 metres (6.6 feet) from all persons to satisfy RF exposure requirements. The distance is measured from the front of the antenna and the human body. It is recommended that the antenna be installed in a location with minimal pathway disruption by nearby personnel.



WARNING!

Do not operate the NCL1170 without connecting a 50-ohm termination to the antenna port. This termination can be a 50-ohm antenna or a 50-ohm resistive load capable of absorbing the full RF output power of the transceiver. Failure to terminate the antenna port properly may cause permanent damage to the NCL1170.



WARNING!

Connect only shielded cables (both the Serial and twisted pair Ethernet) to the NCL1170 RS-232 Serial (DB-9) and 10Base Tx Ethernet (RJ-45) ports. It is the responsibility of the installer to supply and use the correct type of Serial and Ethernet cables.

Customer Support

If you have any problems with the hardware or software, please contact WaveRider Communications Inc. Please provide your NCL1170 model number and software version when requesting support.

Telephone: +1 416-502-3161

Fax: +1 416-502-2968

Email: **Product Assistance:**
techsupport@waverider.com

URL: www.waverider.com

WaveRider offers a complete training program. Please contact your sales representative for training information.

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