IN*finity* 510

User's Guide

sirit
vision beyond sight ™

Preface

Sirit's IN*finity* 510 User's Guide is designed to allow you quickly install, configure, and operate your reader. This guide only provides instructions for a basic installation and you should refer to the IN*finity* 510 Developer's Guide and Protocol Reference Guide for more detailed programming, configuration, and operation instructions.

Information Included in this Guide

Information provided in this guide includes:

➤ Safety Instructions
➤ Reader Overview
➤ Reader Equipment Installation
➤ Reader Software Installation
➤ Reader Configuration
➤ Reader Operation
➤ Specifications

Intended Audience

This document is intended for those who wish to quickly setup and operate the IN*finity* 510. Before attempting to install, configure, and operate this product, you should be familiar with the following:

➤ Windows-based software installation and operation
➤ Device communication parameters including Ethernet and serial communications
➤ RFID reader configuration including antenna placement and RF
➤ Basic digital input/output control

Reader Overview

Introduction

The IN*finity* 510 is a multiprotocol, multiregional Radio Frequency Identification (RFID) System that operates in the 860 – 960 MHz UHF band.

Figure 1   IN*finity* 510 UHF Reader

As shown in the following figure, this high performance reader supports up to four Tx/Rx antennas and one Listen before Talk (LBT) antenna and is equipped with both serial and Ethernet interfaces. Discrete digital inputs and outputs are also provided.
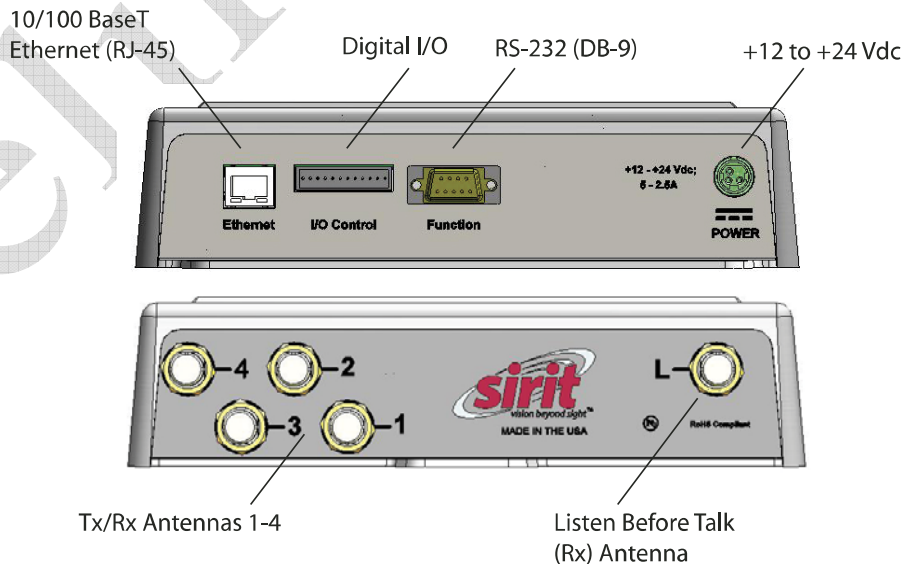
Figure 2   IN*finity* 510 Power and I/O Connections

The IN*finity* 510 is equipped with four status indicators located on the top of the enclosure. These LEDs provide indication for the following:

➤ Sense – Indicates reader has detected a tag in the RF field.
➤ Transmit – Indicates the reader's transmitter is operating (RF on).
➤ Fault – Indicates a fault occurred.
➤ Power – Indicates that power is applied to the reader.

During power up, the LEDs will momentarily flash.

Reader Equipment Installation

Mechanical Installation

Mounting the Reader

The IN*finity* 510 is equipped with two mounting flanges and slotted keyholes that accept three #8 (M4) mounting screws. Predrill any mounting surface according to the following dimensions. Any mounting surface must be able to support up to four pounds (1.8 kg).

3 3/32"
(78.6 mm)

(3X) LOCATION
FOR #8 Screw (M4)

6 3/16"
(157.2 mm)

12 15/32"
(316 mm)
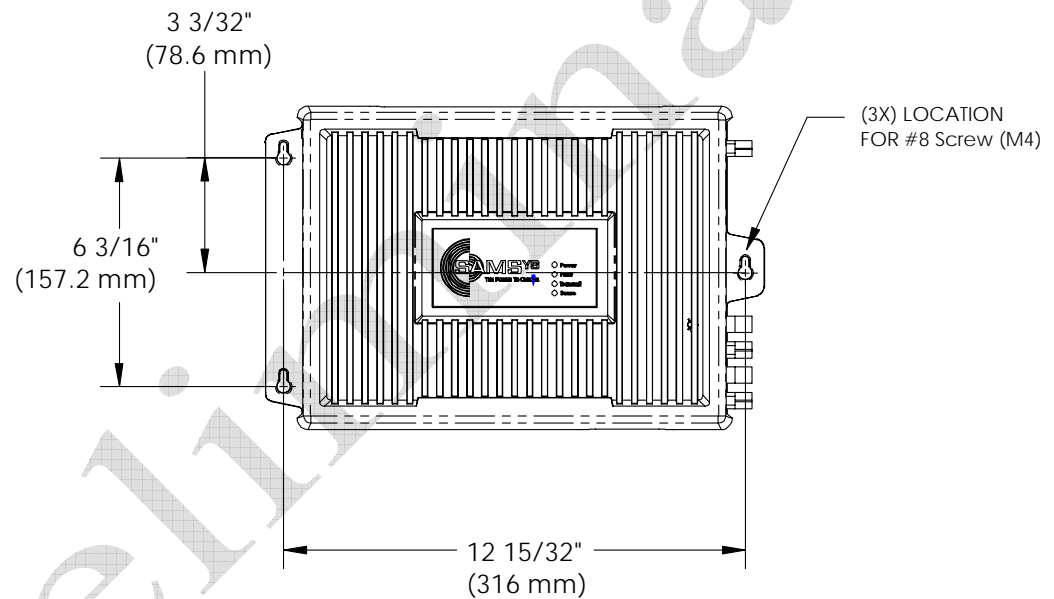
Concrete Wall Mounting

To mount the IN*finity* 510 to a hollow concrete block wall, Sirit recommends metal sleeve type concrete anchors that accept #8 screws and flat washers.

Wood or Metal Wall Mounting

To mount the IN*finity* 510 to a wood or sheet metal wall, Sirit recommends either #8 x 1 inch wood screws or #8 x 1 inch sheet metal screws and washers.

Drywall Mounting

To mount the IN*finity* 510 to drywall or sheetrock, Sirit recommends either #8 toggle bolts or #8 drywall anchors.
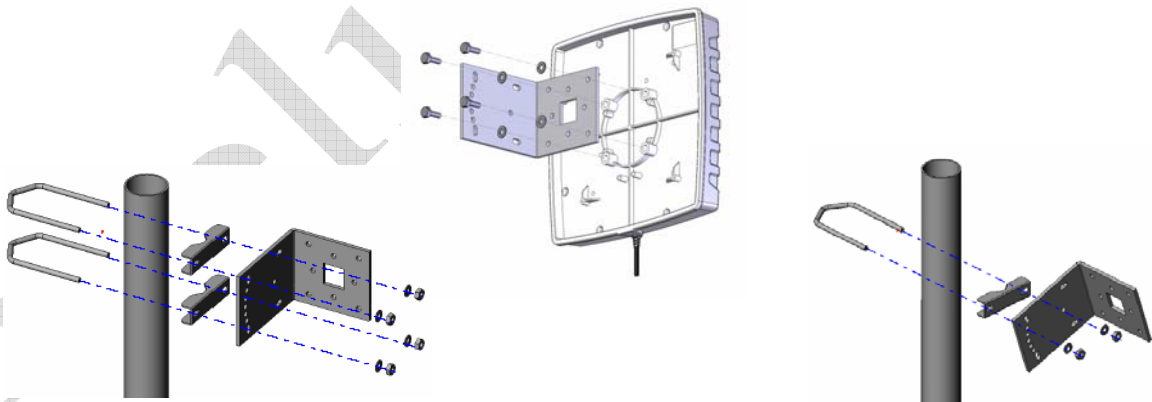
Mounting the Antennas

The IN*finity* 510 supports from one to four antennas in a variety of configurations. One and two-antenna configurations are typical for most conveyor and container tracking. Four-antenna configurations are used for portals and loading dock doorways.

The optional Sirit provided antennas are for indoor use only and must be installed on a solid surface or frame to prevent damage or later misalignment. It is highly recommended that the antenna mounting be adjustable in order to obtain the best performance from the system.
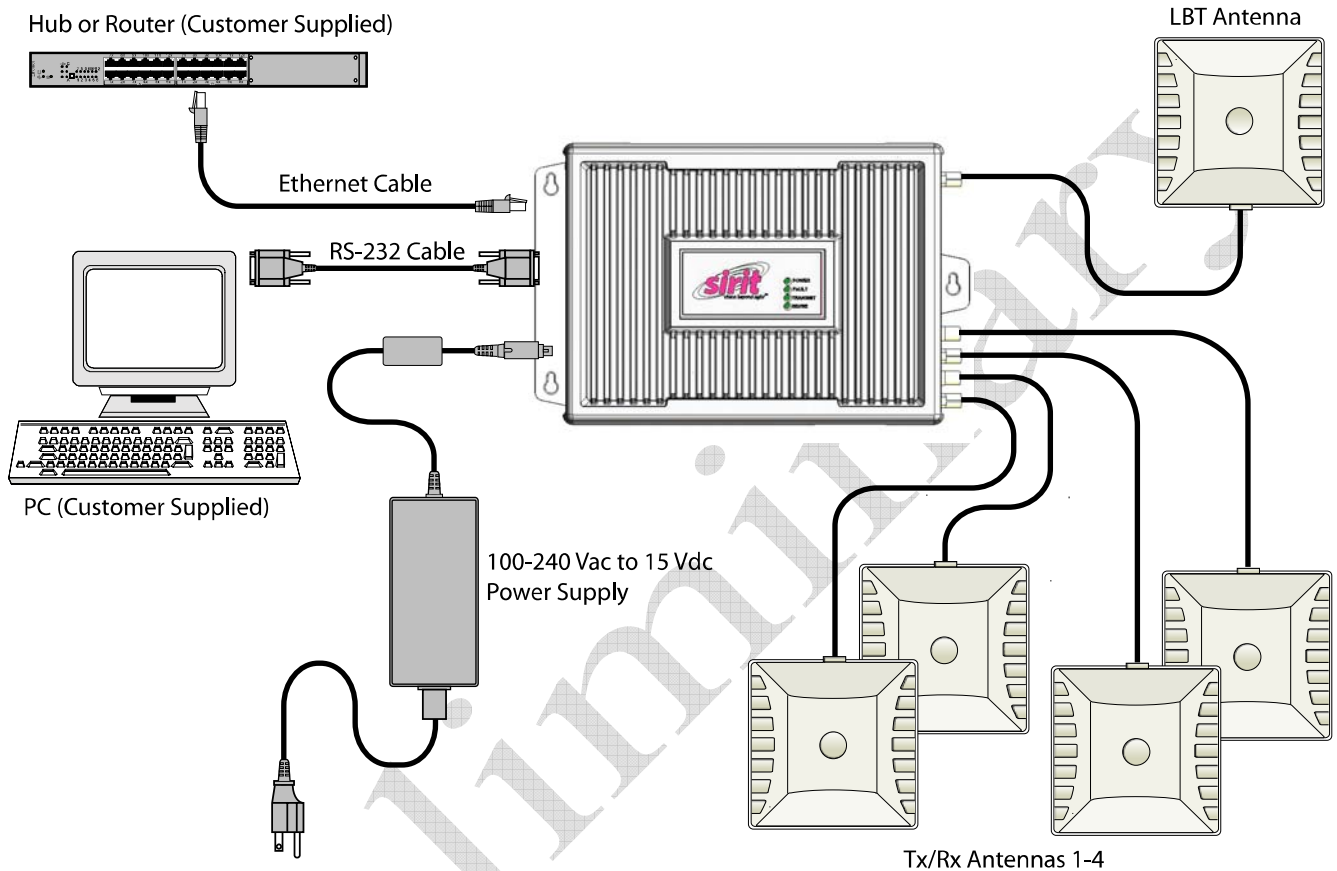
WARNING: *FCC Radiation Exposure Statement. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.*
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Typical Antenna Pole Mount

Electrical Installation

Hub or Router (Customer Supplied)

LBT Antenna

Ethernet Cable

RS-232 Cable

PC (Customer Supplied)

100-240 Vac to 15 Vdc
Power Supply

Tx/Rx Antennas 1-4

⚠ Caution: *The INfinity 510 is designed to meet the regulatory requirements in those jurisdictions in which it is offered. Changes or modifications not expressly approved by Sirit Inc for compliance could void the user's authority to operate the equipment.*

Connecting the Serial Port

The IN*finity* 510 is equipped with one DB9 type RS-232 serial port for communication up to 115 Kbaud. If you are using the serial port for reader communication, connect a serial cable from the COM port on your PC to the serial port on the reader. See Figure 2 for location of the connector.

Connecting the Ethernet Port

The maximum Ethernet cable length is 30 meters. If you are communicating with your reader across a Local Area Network (LAN), connect an Ethernet cable from your hub or router to the RJ-45 connection. See Figure 2 for location of the connector. If you are connecting the reader directly to a PC, you must use a crossover cable. See Note to the left.

Connecting the Antennas

The maximum antenna cable length is 10 meters. Connect the antenna to antenna port **1**. If you are using additional antennas connect them to Ports 2-4. If applicable, connect the LBT antenna to the **Listen** port

Caution: *The INfinity 510 UHF Reader is equipped with four (4) RF ports. To prevent reader damage, active RF ports must be properly terminated with a 50 ohm load or a functional UHF antenna before power up. UHF Readers are factory configured to operate on RF port 1. As a result, port 1 must be properly terminated before initially powering on the reader. Before activating any additional RF ports, they must also be properly terminated. Never power up the reader unless the appropriate loads or antennas are connected. Always power down the reader before removing an antenna or load from an RF port.*

The maximum antenna cable length is 10 meters.

Connecting Digital Inputs/Outputs

The INfinity 510 is equipped with a general purpose digital input/output (I/O) port that provides four optically isolated 5-24 Vdc input signals and four open-collector output signals. The digital inputs can be used as general purpose inputs or to trigger the reader for tag reading. These inputs can be configured to provide an external read trigger from proximity sensors, photoswitches, or other devices.

The digital outputs can be used as general purpose outputs, to indicate tag reading activity, or to indicate the reader is transmitting (RF On). The outputs can also be configured to trigger conveyor gates or other access control and sorting devices.

Connecting the Power

Connect the 15 Vdc power supply to the reader and connect the power supply to your 100-240 Vac, 50-60 Hz power source. Allow 30 seconds for the reader to initialize.
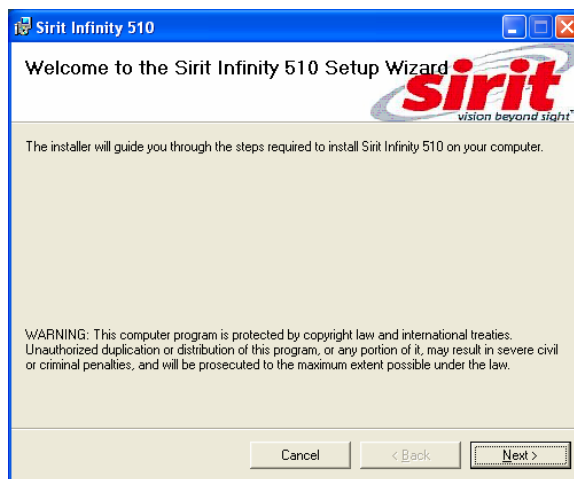
Reader Software Installation

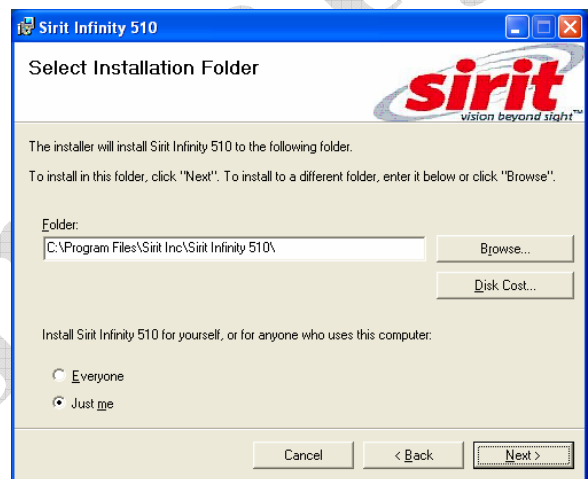## Installing Reader Configuration Software

The IN*finity* 510 is equipped with a Microsoft Windows PC application called Reader Startup Tool (RST). You can use this application to configure the reader as well as read and display tag data.
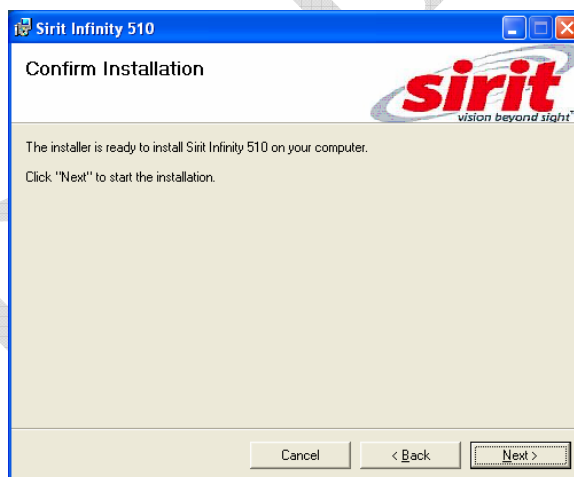
Install RST

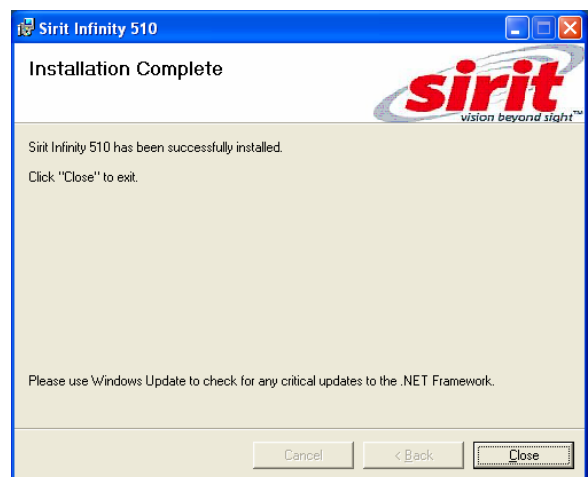**1**   To install RST, load your system CD and double-click the Setup.exe file:

2 Press **Next>**

3 Verify the directory and path where the RST files will be installed. Press **Next>**

4 Press **Next>**

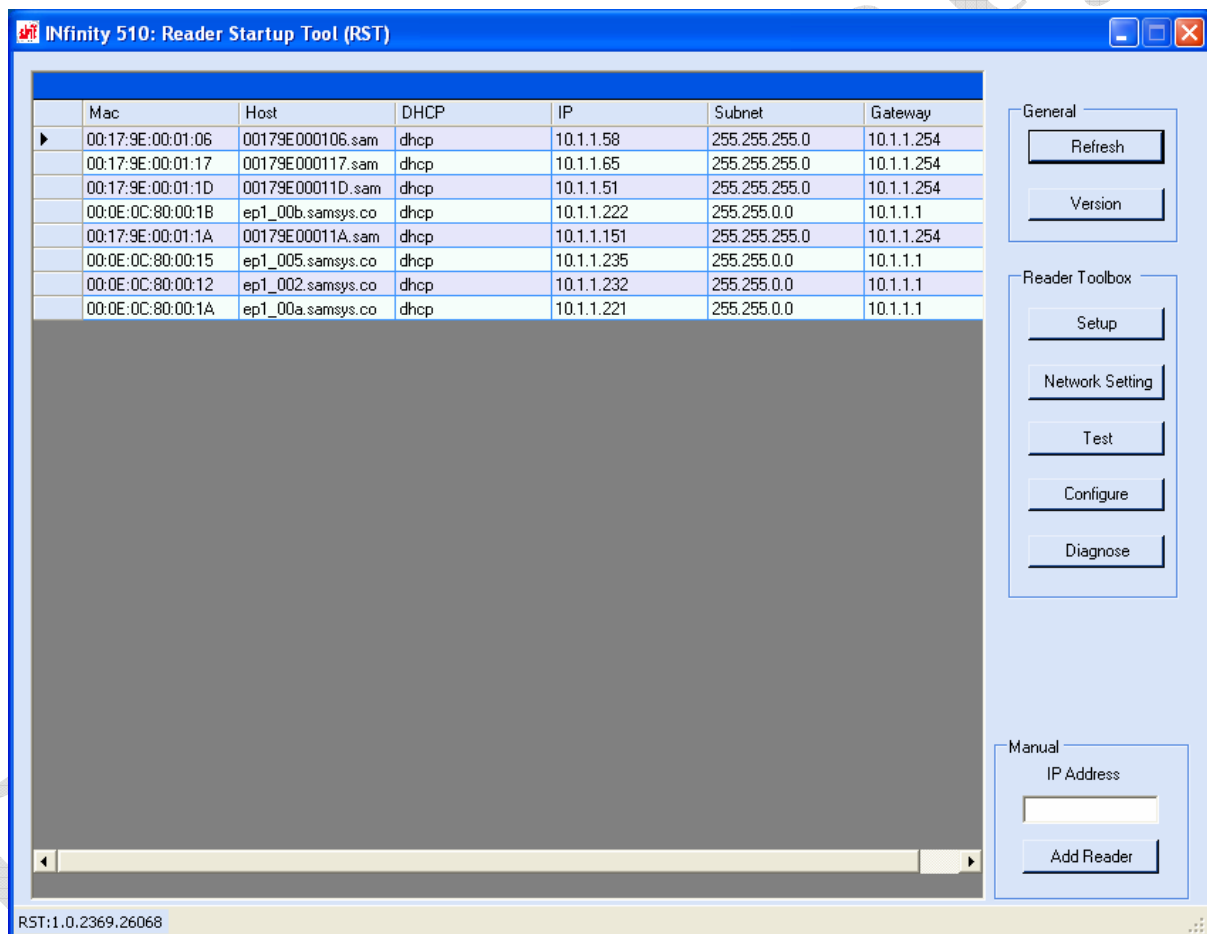**5** Press **Close** when the installation is complete.

Reader Configuration

Start RST

To start your reader configuration, open the RST application.

Open RST

1   From your Windows desktop, select:

Start→Programs→Sirit→INfinity510→Reader Startup Tool

2   If this is the first time starting the RST application, you may receive a Windows Security Alert. This warning indicates that the firewall is blocking the RST application.

3   If the warning window is hidden under the RST windows, collapse the RST window.

4   Press Unblock.

5   Press **Refresh** on the RST

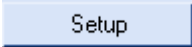6   The RST main screen will display any readers currently connected to the network.
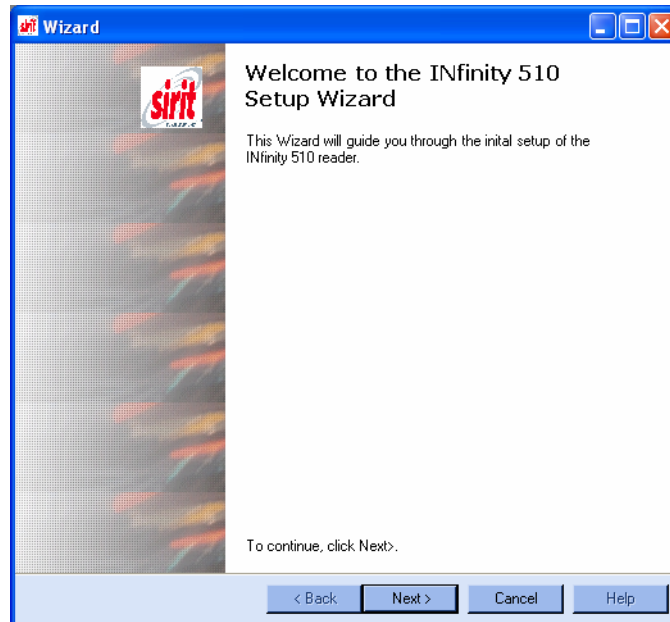
Initial Reader Setup

To configure a specific reader, perform the following:

Reader Setup

1   Select the reader on the main RST screen by clicking the button to the left of the reader Mac address.
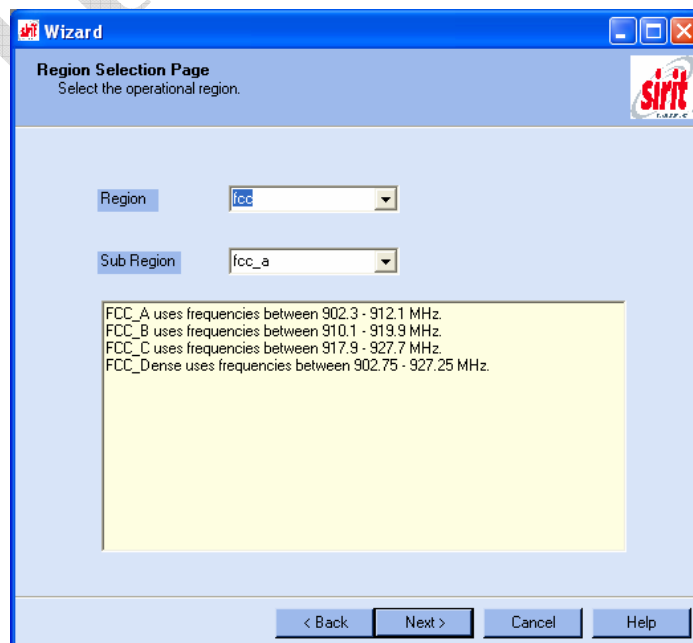

2   Press the [Setup] button on the RST window.

3   The IN*finity* 510 Setup Wizard is displayed.

4   Press **Next>**.

5   Enter the Login (admin) and Password. If this is the first time
         configuring your reader, enter: **readeradmin**

6   Press **Next>**.

7   Select the Region and Sub Region from the pull-downs and press **Next>**.
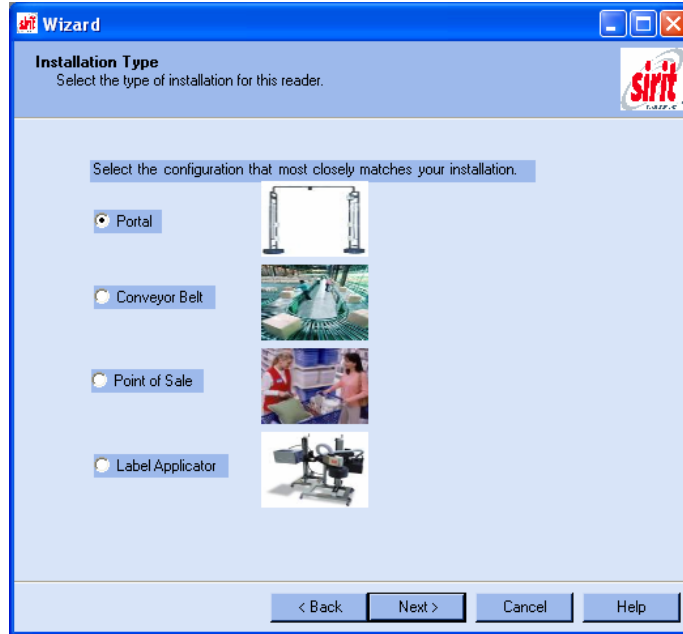
8   Select a configuration that most closely resembles your installation and press **Next>**.
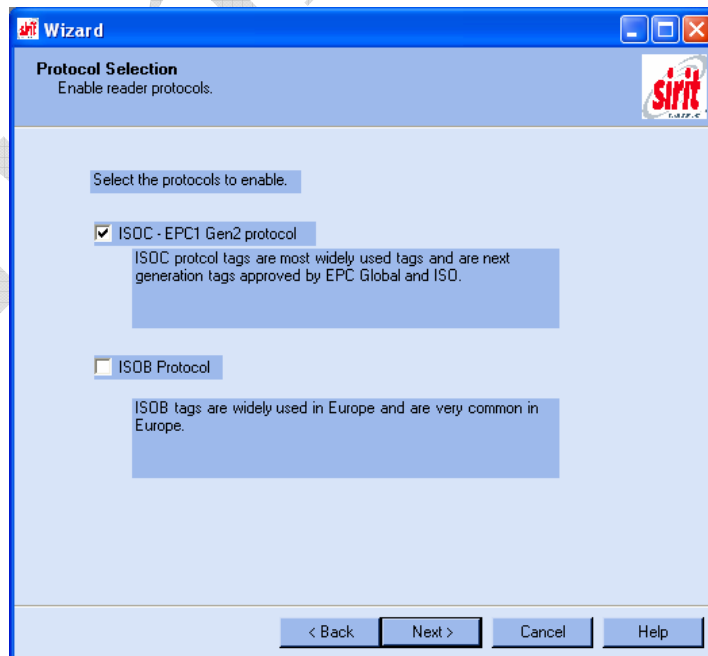
9   Select the protocol of the tags you will be reading and press **Next>**.
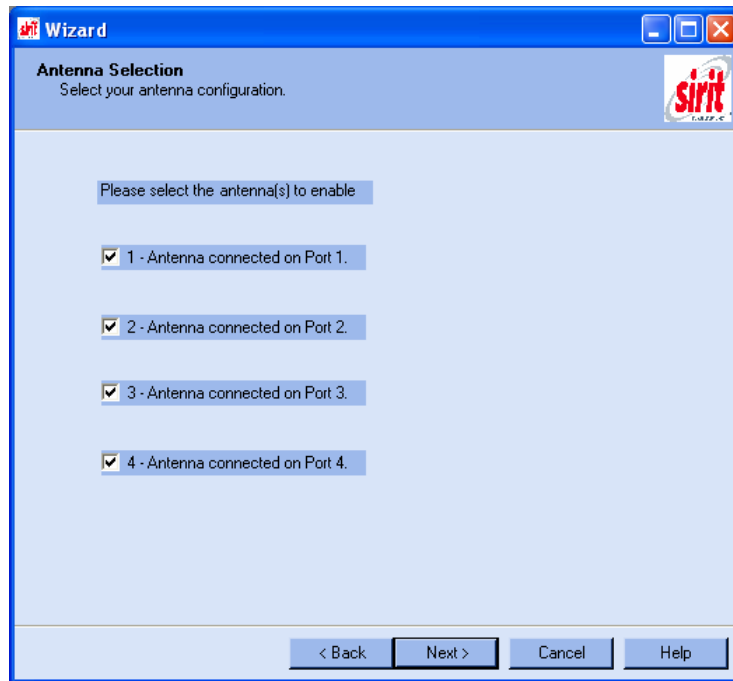
10 Select the antennas you will be installing and press **Next>**.
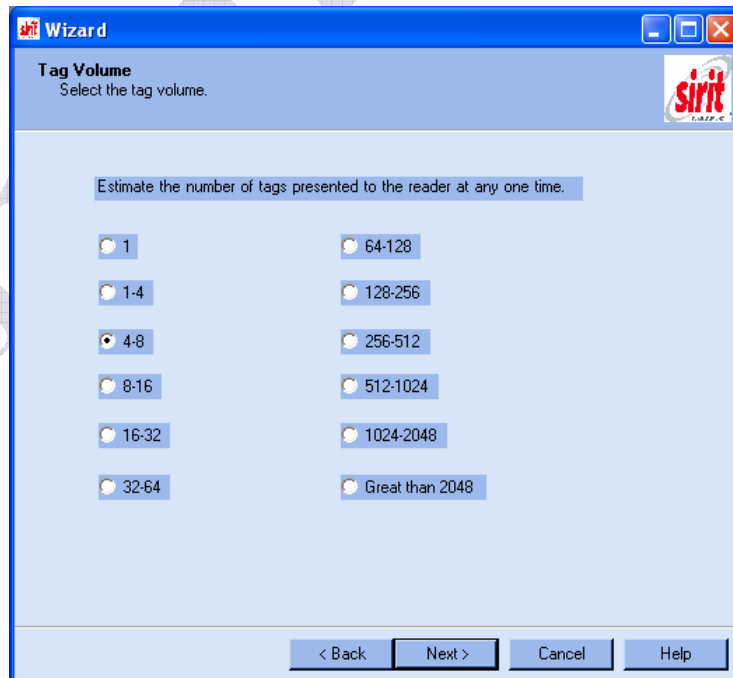
11 Estimate the number of tags that will be presented to the reader at any one time and press **Next>**.

12   Press **Finish** to complete the initial reader setup.

Reader Operation

Basic Operation with the Reader Operation Tool

The IN*finity* 510 can be operated either from the RST application or by logging directly into the reader's embedded web interface. To operate the reader from RST, perform the following:

1   From the RST main screen, press **Operate Reader.** The Reader Operator Tool (ROT) is displayed.
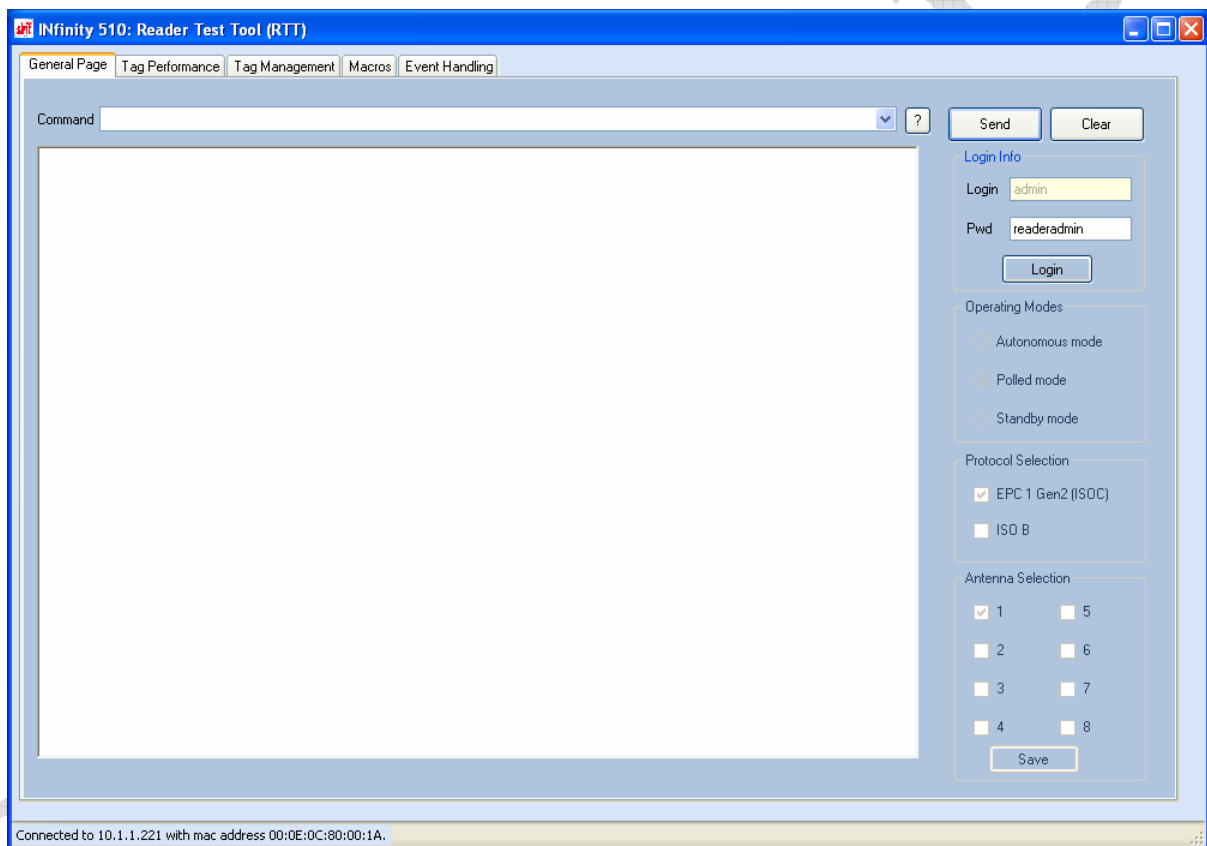
2   Login to the reader. The initial password (**Pwd**) is `readeradmin`. See the Advanced Setup section for details on changing the password.

3   Verify the Operating Mode is set to **Polled Mode**.

4   Select the **Tag Performance** tab.

5   Press **Start**.
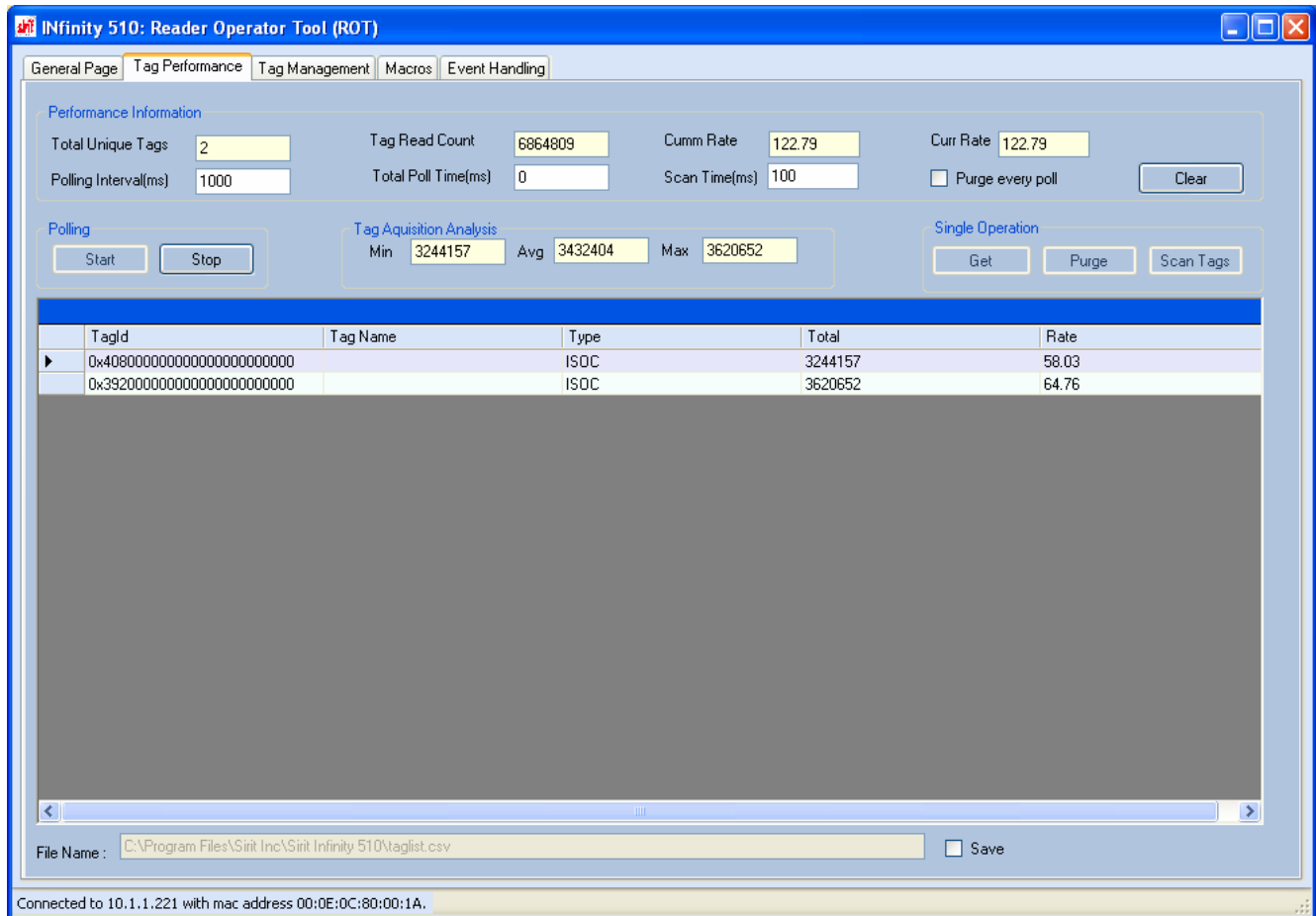
6   Place your tags in front of the antenna and verify the tags are read and displayed as shown in the previous figure.

Advanced Setup

You can also customize the reader setup to more closely match your installation. This is performed by logging directly into the reader's embedded web interface. You can access this interface from RST. Perform the following:

1   From the RST main screen, press **Configure**. The IN*finity* 510 Reader Configuration Tool (RCT) is displayed.

2   Select the specific configuration category and follow the instructions.

Specifications

Reader Specifications

Frequency	860-960 MHz
RF Power	10 mW – 2W conducted
Connections	RS-232, Digital I/O, Ethernet LAN, and WiFi 802.11 (optional)
Input Voltage	12 to 24 Vdc, 60W
Input Current	2.5A maximum at 24 Vdc 5.0A maximum at 12 Vdc

Environmental Specifications

Operating Temperature	-4° F to 131° F (-20° C to 55° C)
Storage Temperature	-40° F to 185° F (-40° C to 85° C)
Maximum Shock	1 foot (0.3 meter) drop to any corner
Relative Humidity	5% to 95% non-condensing
Case Material	Aluminum
Case Dimensions	8.7 x 11.8 x 2.2 in (220 x 300 x 56 mm)
Weight	4 lbs (1.8 kg)

Battery Specifications (Optional)

Battery	Lithium/Manganese Dioxide
Designation	ANSI/NEDA 5012LC / IEC-CR1220
Voltage	3.0 volts
Average capacity	40 mAh to 2.0 volts

⚠ *Caution - Risk of Explosion*

Only replace battery with same type and designation. There is risk of explosion if battery is replaced with incorrect type. Dispose of old battery according to manufacturer's instructions and local regulations.

Power Supply Specifications

Input Voltage	100 – 240 Vac
Input Consumption	60W maximum
Input Frequency	50 – 60 Hz
Output Voltage	15 VDC
Output Current	4A maximum

RS-232 Specifications

Connector	DB-9S
Baud rate	9600 - 115200 (Default = 57600)
Parity	None
Data bits	8
Stop bits	1
Signals	
Pin 1	CNVSS
Pin 2	TXD
Pin 3	RXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	CTS
Pin 8	RTSA
Pin 9	+3.3 Vdc

Ethernet LAN Specifications

Connector	RJ-45
Ethernet	10/100 BaseT
Indicators	Yellow - Indicates link is operational
	Green - Indicates network traffic detected.
Signals	Pin 1 – TXD+ (Transmit Data +)
	Pin 2 – TXD- (Transmit Data -)
	Pin 3 – RXD+ (Receive Data +)
	Pin 4 – EPWR+ (Power from switch +)
	Pin 5 – EPWR+ (Power from switch +)
	Pin 6 – RXD- (Receive Data -)
	Pin 7 – EPWR- (Power from switch -)
	Pin 8 – EPWR- (Power from switch -)

Digital Input/Output Specifications

Connector	Plugcon 31374112 (1x12)
Input	5 to 24 Vdc, 1 to 5 mA, Optically Isolated
Output	Open Collector (3 to 40 V, 100 mA Max)
Signals	Pin 2 – DIN1 (Digital Input 1) Pin 3 – DIN2 (Digital Input 2) Pin 5 – DIN3 (Digital Input 3) Pin 6 – DIN4 (Digital Input 4) Pin 1, 4 – Digital input common Pin 8 – DOUT1 (Digital Output 1) Pin 9 – DOUT2 (Digital Output 2) Pin 10 – DOUT3 (Digital Output 3) Pin 11 – DOUT4 (Digital Output 4) Pin 7,12 – Digital output common

Antenna Specifications

Type	PATCH
Frequency (FCC)	860 – 960 MHz
Polarization	Circular
Gain	7 dBi ± 1 dBi, max
VSWR, maximum	1.3:1 or less
Axial ratio	1 dB or less
Input impedance	50 Ohm (nominal)
Power Handling	10 W
Size	245 mm x 235 mm x 40 mm
Weight	470g

Caution: This device has been designed to operate with no more than 1 Watt into the antenna and an antenna gain of no more than 6 dBic. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada, unless power into the antenna is decreased to compensate for the increased antenna gain. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit an RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website at www.hc-sc.gc.ca/rpb.

Optional Sirit supplied antennas are for indoor use only.

Safety Instructions

Power Disconnect Device

The plug on the power supply cord is intended to be the power disconnect device. As a result, <u>the power source (socket or outlet) shall be located near the equipment and shall be easily accessible</u>.

WARNING: *FCC Radiation Exposure Statement. The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.*

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Caution: *The INfinity 510 UHF Reader is equipped with four (4) RF ports. To prevent reader damage, active RF ports must be properly terminated with a 50 ohm load or a functional UHF antenna before power up. UHF Readers are factory configured to operate on RF port 1. As a result, port 1 must be properly terminated before initially powering on the reader. Before activating any additional RF ports, they must also be properly terminated. Never power up the reader unless the appropriate loads or antennas are connected. Always power down the reader before removing an antenna or load from an RF port.*

The maximum antenna cable length is 10 meters.

Caution: **Risk of Explosion.** *Only replace battery with same type and designation. There is risk of explosion if battery is replaced with incorrect type. Dispose of old battery according to manufacturer's instructions and local regulations.*