

IDentity 5100



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USER'S GUIDE

IDentity 5100

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About Sirit

Sirit Technologies designs, develops, manufactures and sells Radio Frequency Identification (RFID) technology. Targeted at a diverse set of markets RFID technology has become a core technology for applications including: electronic toll collection, access control, cashless payment systems, product identification, and supply chain management systems including logistics, warehousing and manufacturing, and asset management.

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Preface

Intended audience

This document is intended for professional installers setting up and installing the IDentity 5100 Radio Frequency Identification system. Before attempting to install, configure, and operate this product, you should be familiar with the following:

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

What's in this guide

The information in this guide is presented as follows:

Reader Overview – This chapter provides a brief overview of the IDentity 5100 hardware and software.

Reader Equipment Installation – This chapter describes how to mechanically and electrically install the reader.

Reader Startup Tool (RST) Software Installation – This chapter describes how to install the Microsoft Windows based RST application.

Reader Operation – This chapter describes how to initially test a reader and how to operate deployed readers.

Reader Startup Tool (RST) – This chapter describes the RST and the various functions you can perform with this Microsoft Windows based application.

Embedded Reader Configuration Tool (RCT) – This chapter describes the RCT and the various functions you can perform with this embedded reader application.

Configuring Digital Inputs and Outputs – This chapter describes how to setup the reader's digital inputs and outputs.

Specifications – This chapter detailed mechanical, electrical, and environmental specifications for the IDentity 5100.

Safety Instructions – This chapter provides important safety information about the IDentity 5100. All users must read this section before installing or operating this reader.

What's New in this Version

Version 1.0 is the initial release of this document.

Conventions used in this manual

The following conventions are used in this manual:

Bold courier font indicates code entered by the user

(values) within parentheses indicate parameters

(values) in italics indicate user defined variables.

<n> indicates a variable number used in a function that can apply to several different devices such as antennas or I/O ports.

NOTES

Important information and other tips are presented in light blue boxes to the left of the applicable section.



WARNING: *Warnings advise the reader that a hazardous condition can be created by a particular action that can cause bodily injury or extreme damage to equipment*



ATTENTION: *This warning indicates that the device is susceptible to Electro Static Discharge and appropriate precautions must be taken to avoid equipment damage.*



Caution: *Cautions advise the reader that a condition can be created by a particular action that can cause equipment damage or result in equipment operation that violates regulatory requirements.*

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Reader Overview

Reader Hardware

The IDentity 5100 is a multi-protocol, multi-regional Radio Frequency Identification (RFID) System that operates in the 860 – 960 MHz UHF band. The reader is configured at the factory to operate within a specific regulatory region (for example: FCC in the 902-928 MHz ISM band).



Figure 1 IDentity 5100 UHF Reader with Universal Mount

As shown in the following figure, the IDentity 5100 reader contains one integrated antenna and supports one additional Tx/Rx antenna. The reader is equipped with both RS-232 serial and Ethernet interfaces.

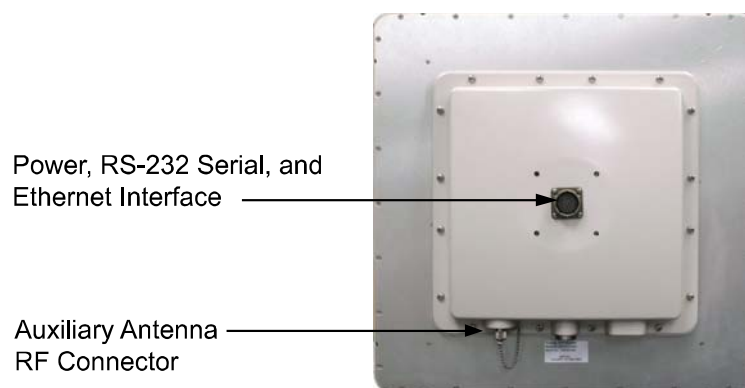


Figure 2 IDentity 5100 Power and I/O Connections

Reader Software

The IDentity 5100 is shipped with two software applications that you can use to configure and control the reader.

Reader Startup Tool (RST)

The RST is a Microsoft Windows based application you install on your computer. With RST, you can view all readers on your network. After selecting a reader, you can modify its communication, network, and operational parameters. You can also read tags, review tag data, perform diagnostics, and upload new software. This RST is primarily intended for initially configuring a reader prior to deployment. After deployment, use the Embedded Reader Configuration Tool (RCT). Detailed information on the RST is provided in Chapter 5.

Embedded Reader Configuration Tool (RCT)

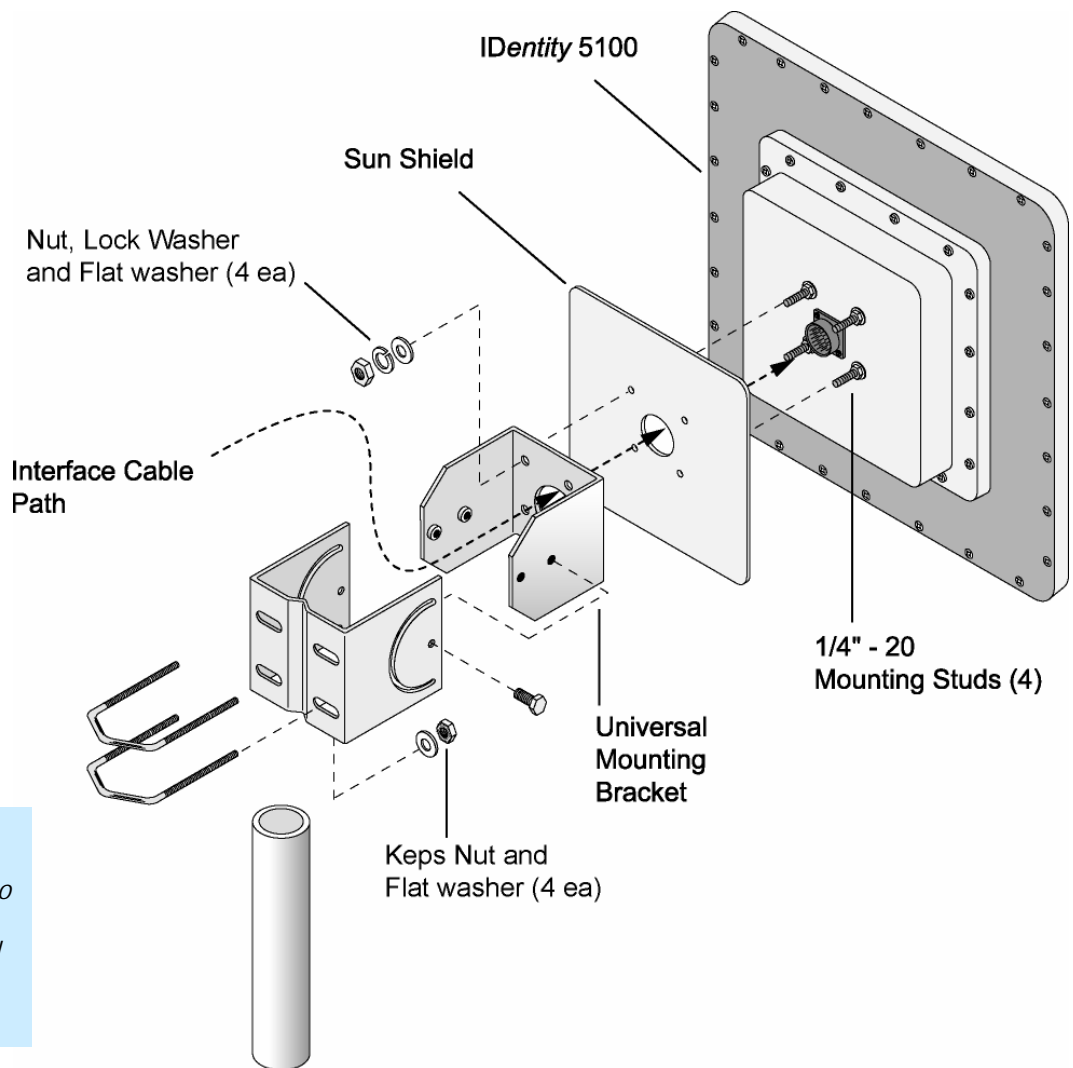
This RCT is an embedded reader application that allows you to access your readers across a LAN or WAN. Enter the IP address of the reader into your Web browser and the RCT allows you to fully modify and operate the reader. With the same functionality as the RST, this application allows you to modify the reader's communication, network, and operational parameters. You can also read tags, review tag data, perform diagnostics, and upload new software. This application is primarily intended for configuring and managing deployed readers. Detailed information on the RCT is provided in Chapter 6.

Reader Equipment Installation

Mechanical Installation

Mounting the Reader

The IDentity 5100 is available with a universal mount suitable for most pole mount applications. Any mounting surface must be able to support a minimum static load of 15.0 pounds (6.8 kg) plus any additional live load due to environmental conditions.



Installation Notice
 Installation of the IDentity 5100 is only to be performed by trained, Sirit approved personnel.

Figure 3 IDentity 5100 Universal Reader Mount

To mount the IDentity 5100 reader assembly, refer to Figure 3 and perform the following:

- 1 Locate the Universal Mounting Bracket assembly and the Sun Shield.
- 2 Disassemble the Universal Mounting bracket. Retain all hardware.
- 3 Locate the Interface Cable.
- 4 Snake the bulkhead connector end of the Interface Cable through the Universal Mounting Bracket and then through the Sun Shield.
- 5 Connect the cable to the reader's bulk head connector and twist to lock in place.
- 6 Install the Sun Shield on the four ¼"-20 studs located on the rear of the reader. The Sun Shield will be spaced off the rear approximately 1/2" to allow for air flow.
- 7 Install the Universal Mounting Bracket on the four ¼"-20 studs.
- 8 Secure the Universal Mounting Bracket and Sun Shield to the reader with the four ¼"-20 nuts, lock washers, and flat washers.
- 9 Install the Pole Mount Bracket to the Mounting Pole using the two U-Bolts, four Keps Nuts, and four Flat Washers.
- 10 Adjust the Pole Mount to the proper height and tighten the hardware.
- 11 Assemble the Universal Mounting Bracket/reader assembly to the Pole Mount.
- 12 Adjust the angle of the reader and tighten the hardware.



WARNING: *FCC Radiation Exposure Statement. The antennas used for this transmitter must be installed to provide a separation distance of at least 1 meter from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.*

Electrical Installation

A general installation diagram is shown in the following figure. Refer to Chapter 7 – *Specifications* for specific information.

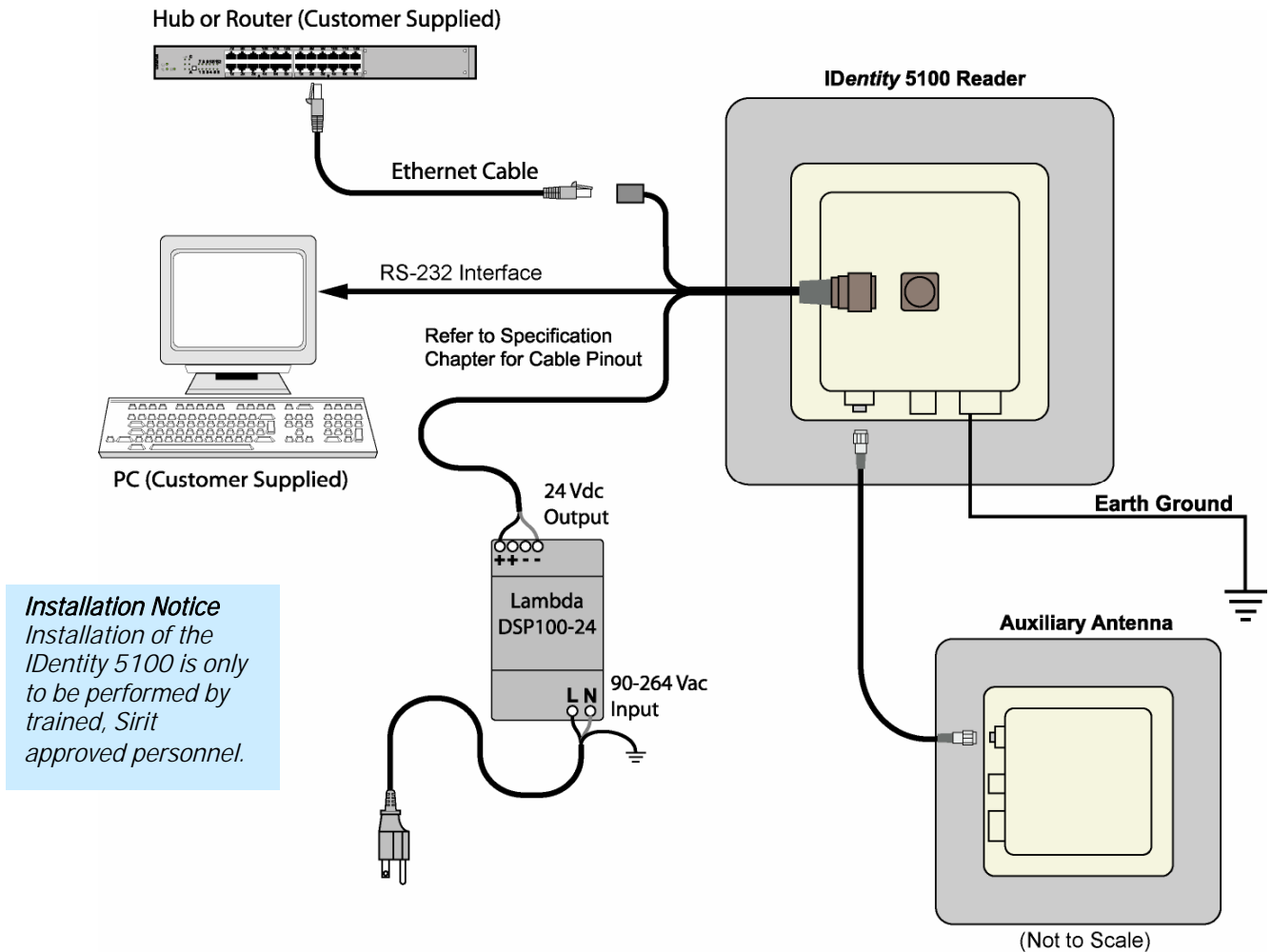




Figure 4 IDentity 5100 Electrical Connections

 **Caution:** The IDentity 5100 is designed to meet the regulatory requirements in those jurisdictions in which it is offered. Changes or modifications not expressly approved by Sirit Technologies for compliance could void the user's authority to operate the equipment.

 **ATTENTION** IDentity 5100 antenna ports may be susceptible to damage from static discharge or other high voltage. Use proper Electrostatic Discharge (ESD) precautions to avoid static discharge when handling or making connections to the IDentity 5100 reader antenna or communication ports. Equipment failure can result if the antenna or communication ports are subjected to ESD.

Connecting the Serial Port

The IDentity 5100 RS-232 serial port provides communication up to 115200 Baud. This port is accessed through the bulkhead connector located on the rear of the reader. 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.

Refer to the Chapter 8 – *Specifications* for details on the bulkhead connector.

Ethernet Cables

In most cases, you will connect the IDentity 5100 to a network hub or router. However, if you are connecting directly to a PC or other computer, you will need a Crossover Cable that swaps the Tx and Rx signals.

Connecting and Configuring the Ethernet Port

The IDentity 5100 Ethernet port is accessed through the bulkhead connector located on the rear of the reader. If you are communicating with your reader across a Local Area Network (LAN), connect an Ethernet cable from your hub or router to the bulkhead connector. If you are connecting the reader directly to a PC, you must use a crossover cable. See Note to the left.

By default, the reader is configured to use a DHCP server to obtain its IP address and related information. In the event a DHCP server is unavailable, the reader will boot with an IP address in the 169.254.x.x subnet.

In the absence of other readers on the same network, and if no other network traffic is observed which references 169.254.1.1, the reader will select that address; otherwise, it will select a random address on the 169.254.x.x subnet.

IP address settings can be changed using RST. Refer to the *View or Change the Reader's Network Settings* section in Chapter 5.

Refer to the Chapter 8 – *Specifications* for details on the bulkhead connector.

Connecting the External Antenna

The IDentity 5100 supports one auxiliary external Tx/Rx antenna. The maximum antenna cable length is 10 meters. Connect the antenna to the antenna port located on the bottom of the reader.

Refer to Chapter 7 – Specifications for specific information regarding the external antenna and antenna cable.



Caution: *The IDentity 5100 is equipped with one (1) auxiliary RF port which is inactive when shipped from the factory. If activated, this RF port must be properly terminated with a 50 ohm load or a functional UHF antenna before power up. Always power down the reader before removing an antenna or load from an RF port.*

The maximum antenna cable length is 10 meters.



ATTENTION *The IDentity 5100 antenna port may be susceptible to damage from static discharge or other high voltage. Use proper Electrostatic Discharge (ESD) precautions to avoid static discharge when handling or making connections to the IDentity 5100 reader antenna or communication ports. Equipment failure can result if the antenna or communication ports are subjected to ESD.*

Connecting Digital Inputs/Outputs

The IDentity 5100 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, photo switches, 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 gates or other access control devices.

Connecting the Power

The IDentity 5100 operates on 24 Vdc provided through the bulkhead connector on the rear of the reader. Connect the 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.

Refer to the Chapter 8 – *Specifications* for details on the bulkhead connector.

Reader Startup Tool (RST) Software Installation

Installing RST Software

The IDentity 5100 is delivered with a Microsoft Windows based application called Reader Startup Tool (RST). You can use this application to initially configure your reader as well as read and display tag data.

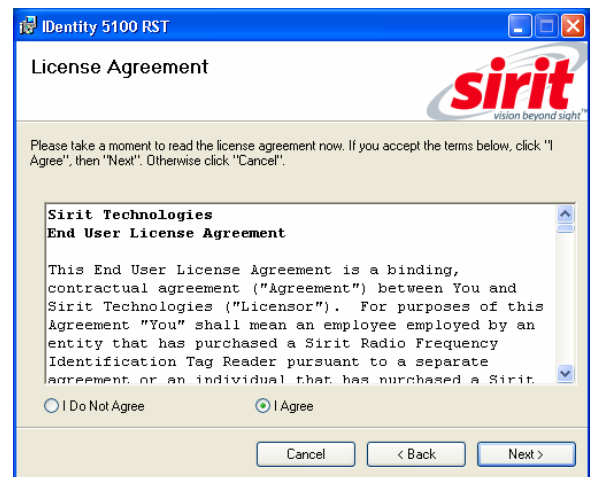
NOTE: The product CD provided with your reader contains two setup files: **setup.exe** and **IDentity_5100_RSTInstaller.msi**. The first file, **setup.exe**, will fully check your system configuration and load all required software including Microsoft .Net 2.0. If you only want to load the RST application, use the **IDentity_5100_RSTInstaller.msi** installation file. Note, however, the installation may abort if the required files are not found on your system.

Install RST

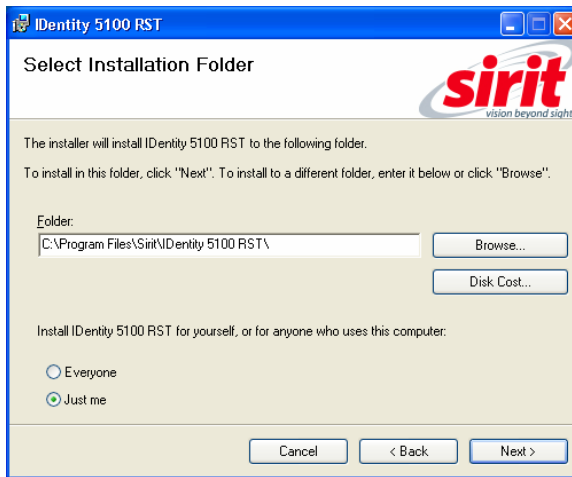
- 1 To install RST, load your product CD and double-click the **setup.exe** or **IDentity_5100_RSTInstaller.msi** file:



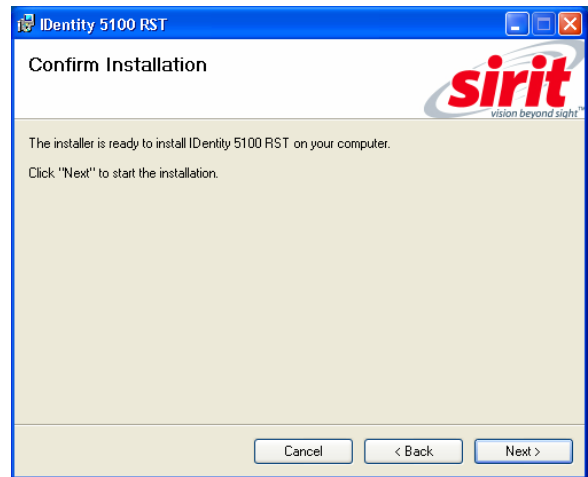
- 2 Press **Next>**



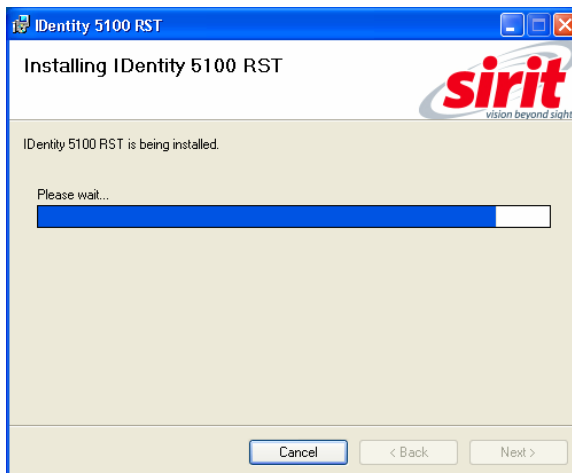
- 3 Read the License Agreement. Select **I Agree** and press **Next>**



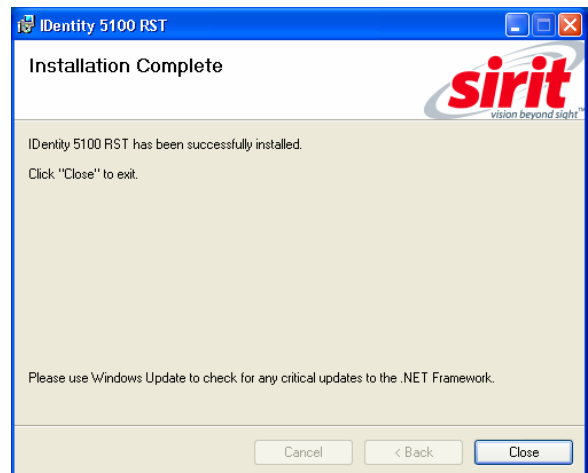
4 Verify the path and folder where RST will be installed. Press **Next>**.



5 Press **Next>**



5 The installation begins.



6 After the installation completes, press **Close**.

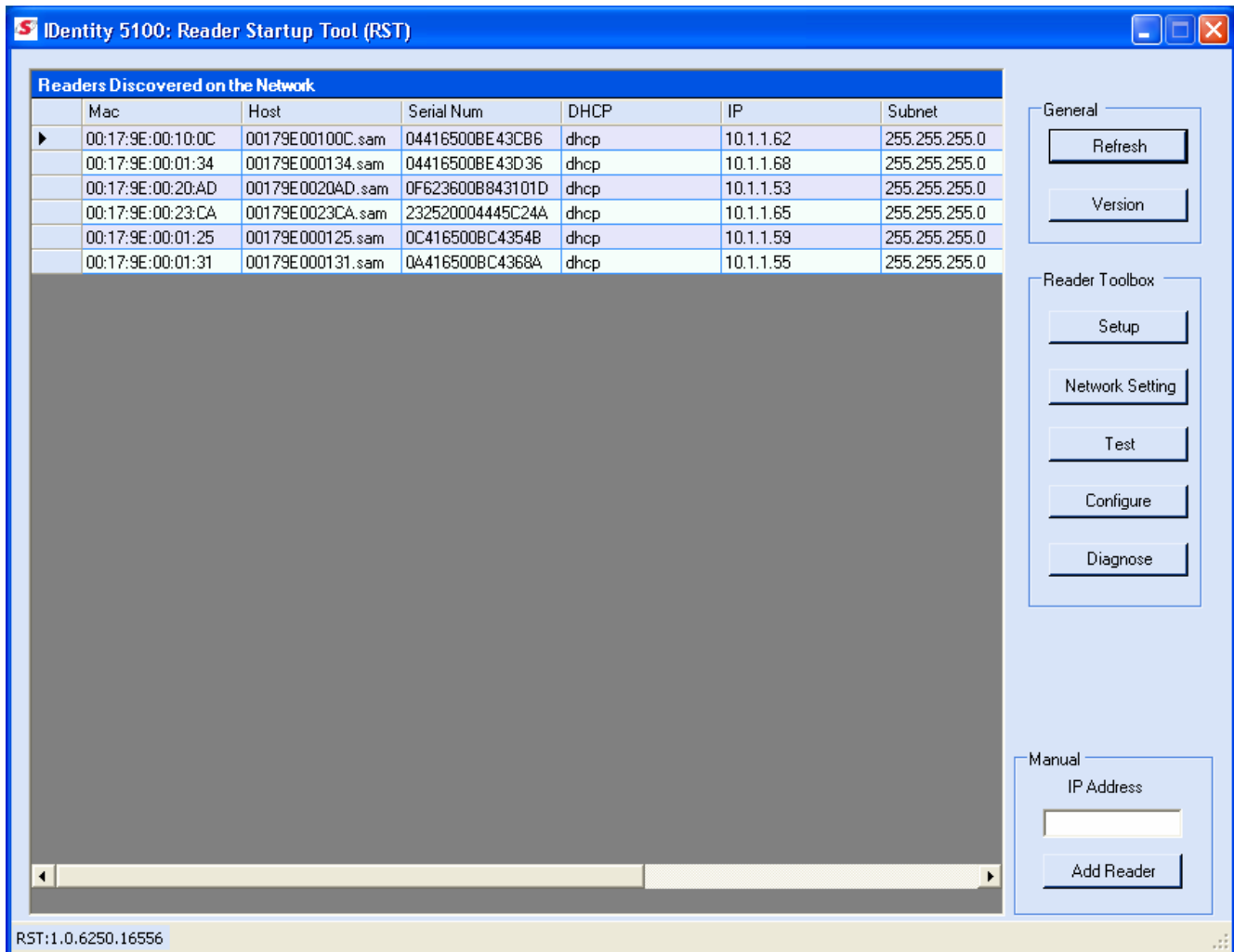
Reader Startup

To begin using your reader, open the RST application.

Open RST

1 From your Windows desktop, select:

Start→**Programs**→**Sirit**→**Identity5100**→**Reader Startup Tool (RST)**



- 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.

NOTE:

Earlier versions of Microsoft Windows™ may not provide the Security Alert popup. IF RST does not discover your reader, check your Windows Firewall/Security settings.



- 4 Press Unblock.
- 5 Press **Refresh** on the RST
- 6 The RST main page will display any readers currently connected to the network.

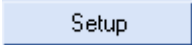
Initial Reader Setup

To configure a specific reader, perform the following:

Reader Setup

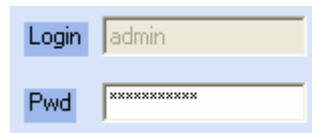
- 1 Select the reader on the main RST page by clicking the button to the left of the reader Mac address.

▶	00:17:9E:00:01:28	00179E000125.sam	0C416500BE43CC6D
	00:17:9E:00:01:1E	00179E00010E.sam	01068D006F43EAF7
	00:17:9E:00:01:24	00179E00013A.sam	06416500BC4367A9

- 2 Press the  button on the RST window.
- 3 The IDentity 5100 Reader Setup Wizard (RSW) is displayed.



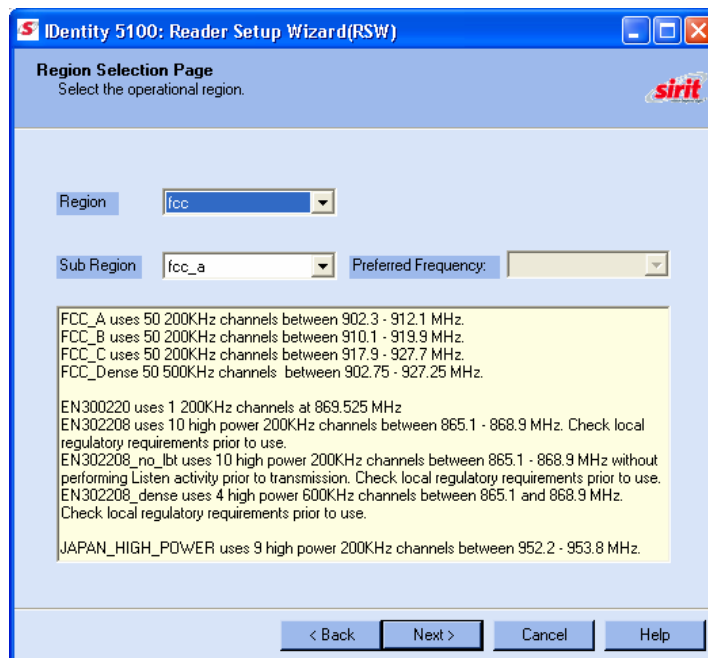
- 4 Press **Next>** and enter the Login (**admin**) and Password. If this is the first time configuring your reader, enter: **readeradmin**.



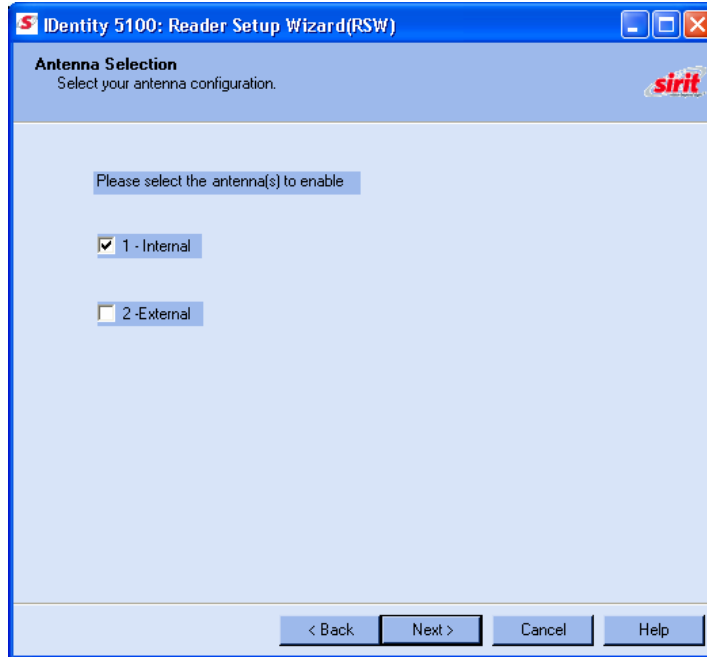
- 5 After entering your Login and Password, press **Next>**.

Region Selection

The reader is configured at the factory to operate within a specific regulatory region. As a result Region Selection is not user configurable.

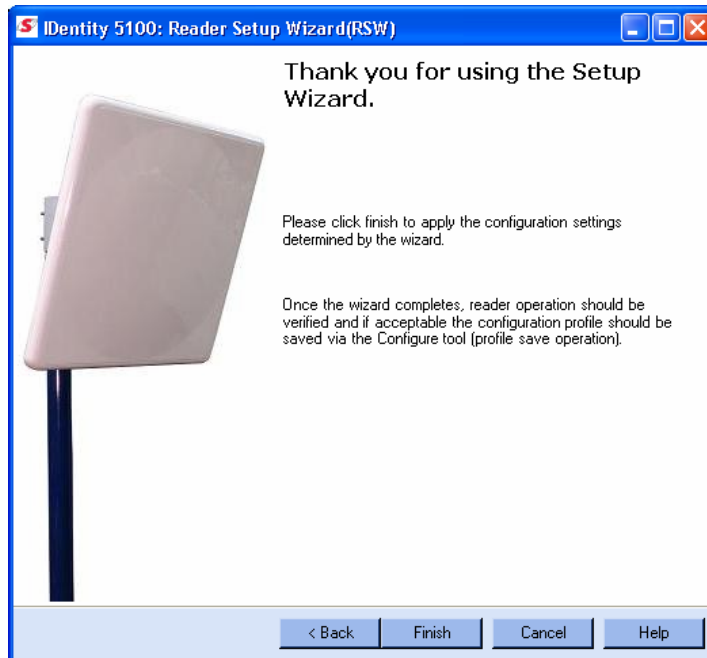


- 6 Select your Region and Sub Region and press **Next>**.



- 7 Select the antennas you will be using and press **Next>**.

Saving Reader Setup
 Reader setup information should be saved as a profile. In the event that you need to reboot or power down a reader, the reader setup can be quickly reloaded by loading the profile. If you don't save the reader setup, you can lose the information if the reader is rebooted. Refer to the Manage Profiles section in Chapter 6 – Embedded Reader Configuration Tool.



- 8 It is recommended that you save the reader setup as a profile.
- 9 Using the Reader Configuration Tool (RCT), select **Save changes to a profile...**, enter a **Profile Name**, and press **Finish** to complete the initial reader setup. See *Manage Profiles* in Chapter 6.

Reader Operation

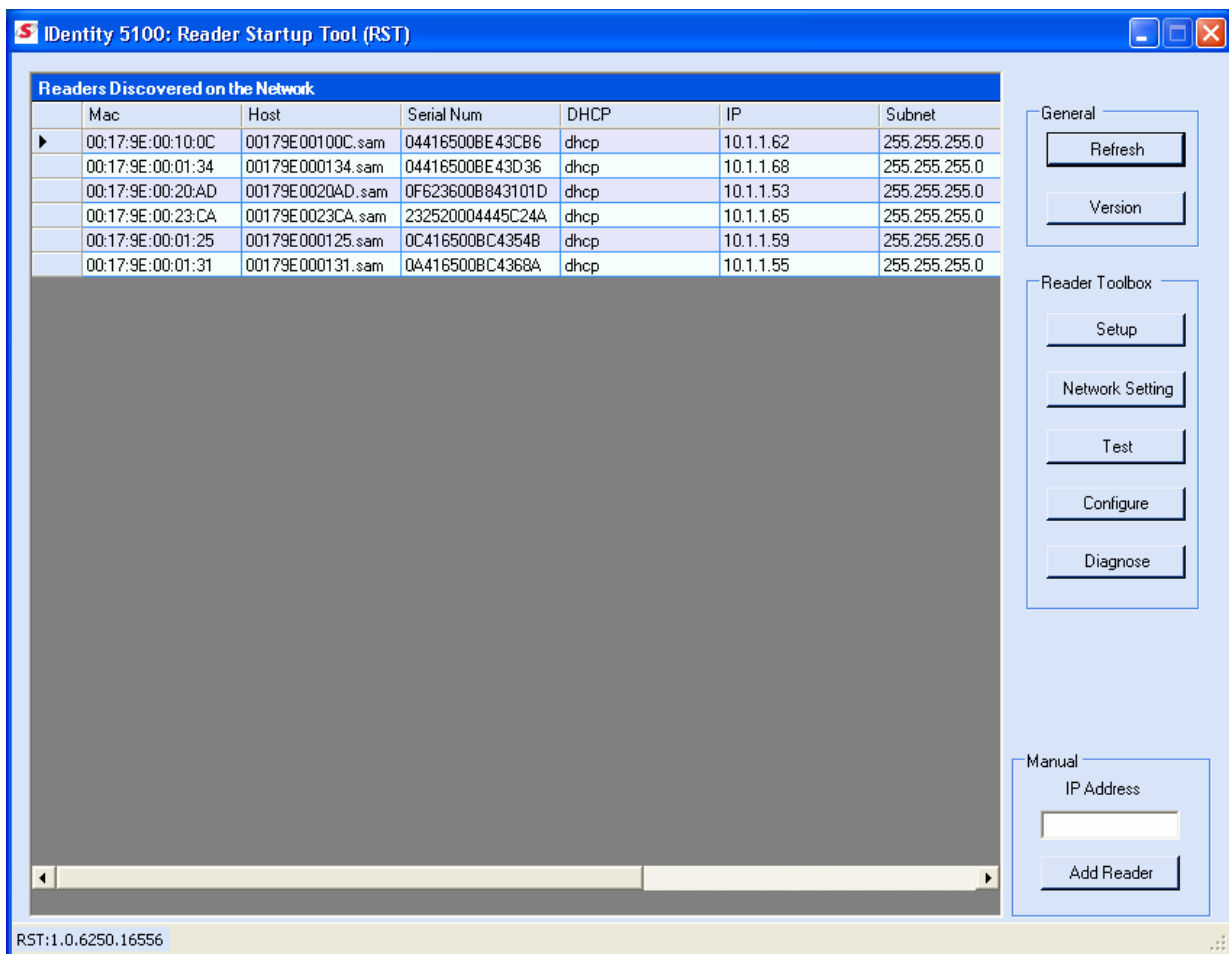
Basic Operation with RST

The *IDentity* 5100 can be operated either from the RST application or by logging directly into the reader's embedded Reader Configuration Tool (RCT). To operate the reader from RST, perform the following:

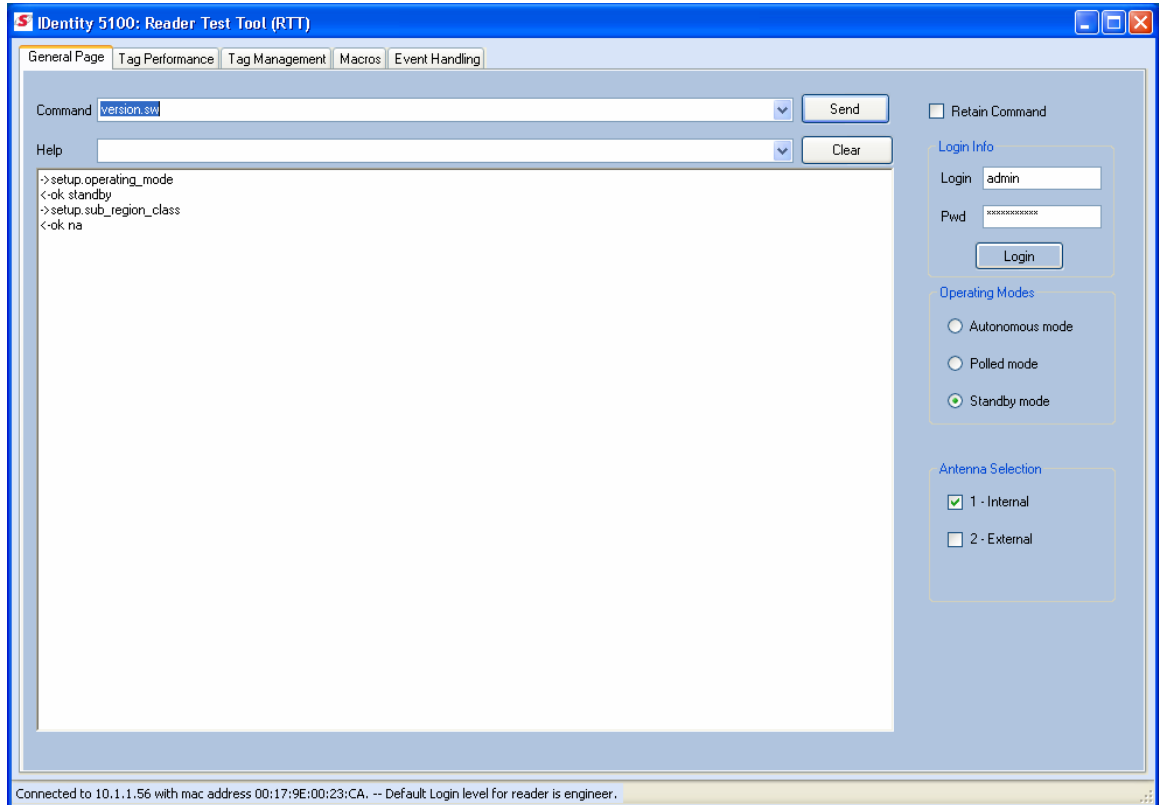
Open RST

- 1 From your Windows desktop, select:

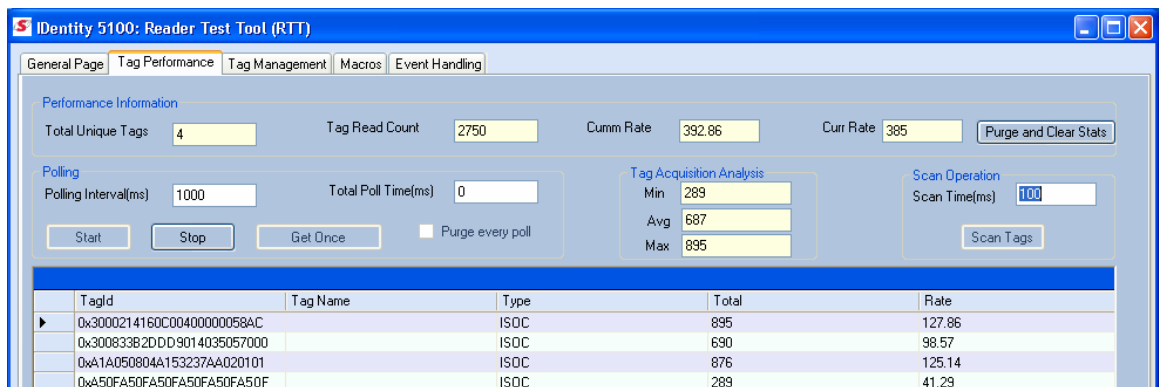
Start→**Programs**→**Sirit**→**IDentity5100**→**Reader Startup Tool (RST)**



- 2 Select a specific reader and press **Test**.
- 3 The Reader Test Tool (RTT) is displayed.




- 4 Login to the reader. The initial password (**Pwd**) is **readeradmin**. See the Advanced Setup section for details on changing the password.
- 5 Verify the Operating Mode is set to **Polled Mode**.
- 6 Select the **Tag Performance** tab and press **Start**.
- 7 Place your tags in front of the antenna and verify the tags are read and displayed as shown in the following figure.



Deployed Reader Operation with RCT

Once your readers are deployed, you can access them directly using the embedded Reader Configuration Tool (RCT). To access a particular reader, perform the following:

- 1 Enter the reader’s IP address into your Web browser or press the  button on the main RST page.
- 2 The reader’s RCT interface is displayed.



- 3 Log into the reader. Press **Login** for the login screen.

Name	Value	?
Login	<input type="text" value="admin"/>	?
Password	<input type="password" value="*****"/>	?

- 4 The default login is **guest**. If you need administrator privileges, login as **admin** and enter **readeradmin** as the password.
- 5 Press **Submit**.
- 6 Select **Basic Configuration** → **Setup Antenna/Cables** to configure the antennas, gain, and power settings.

- 7 Select **Advanced Functions** → **Change Operating Mode** to verify the reader is in the proper mode.
- 8 Select **Basic Configuration** → **Set Tag Protocol** to verify the reader is configured for the proper tag protocol.
- 9 Press **System Status** → **View Tags** to view tag data.

Tag ID	Protocol	Antenna	Repeat Counts	First Read Time	Last Read Time
0x38800000000000000000000000000000	ISOC	1	83	1999-11-30T00:18:16.338	1999-11-30T00:18:29.852
0x300833B2DDD9014035050000	ISOC	1	109	1999-11-30T00:18:16.336	1999-11-30T00:18:29.848

- 10 If you need to configure your reader, refer to *Chapter 7 – Reader Configuration Tool* for information on using RCT to adjust configuration variables and parameters.

Reader Startup Tool (RST)

The Reader Startup Tool (RST) provides an easy-to-use interface for the *IDentity 5100* configuration and operation functions. This Microsoft Windows based application allows you to perform the following:

- View all readers on the network
- Launch the **Reader Setup Wizard** to configure a reader
- View and change a reader's network settings
- Add a new reader to the network
- Launch **Reader Test Tool** to perform basic reader/tag operations
- Launch **Reader Diagnostic Tool** to view statistics, alarms, and reports

View Readers on the Network

When RST starts up, all readers currently connected to the network and powered up are displayed.

Readers On Network

Mac	Host	Serial Num	DHCP	IP	Subnet
00:17:9E:00:10:0C	00179E00100C.sam	04416500BE43CB6	dhcp	10.1.1.62	255.255.255.0
00:17:9E:00:01:34	00179E000134.sam	04416500BE43D36	dhcp	10.1.1.68	255.255.255.0
00:17:9E:00:20:AD	00179E0020AD.sam	0F623600B843101D	dhcp	10.1.1.53	255.255.255.0
00:17:9E:00:23:CA	00179E0023CA.sam	232520004445C24A	dhcp	10.1.1.65	255.255.255.0
00:17:9E:00:01:25	00179E000125.sam	0C416500BC4354B	dhcp	10.1.1.59	255.255.255.0
00:17:9E:00:01:31	00179E000131.sam	0A416500BC4368A	dhcp	10.1.1.55	255.255.255.0


RST:1.0.6250.16556

Configure Reader with the Setup Wizard

The Reader Setup Wizard is used to initially configure your reader for operation. With this application, you can select the following:

- Regulatory region (fixed at factory) and sub-region
- Preferred Frequency (depending on regulatory settings)
- Number of antennas

To initially configure your reader perform the following:

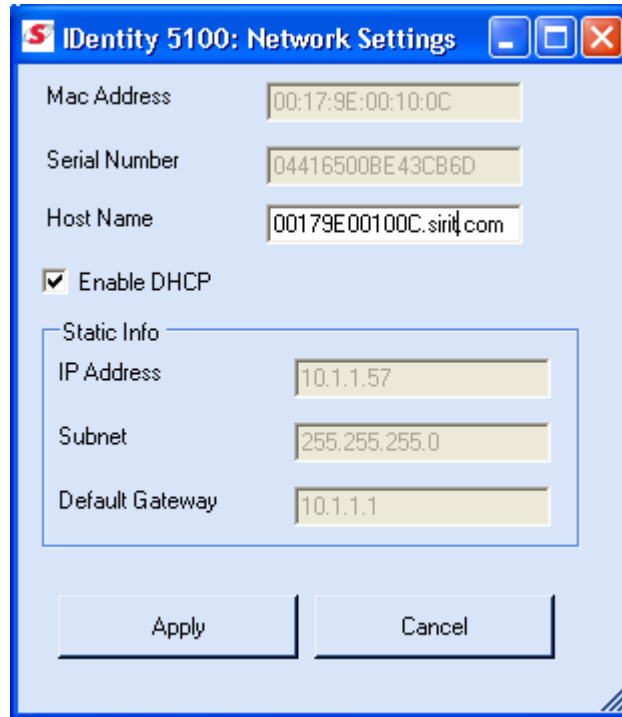
- 1 From the RST main page, press the  button. The Setup Wizard is launched as shown.



- 2 Refer to Chapter 2 – *Reader Configuration* for detailed instructions on using the Reader Setup Wizard.

View or Change the Reader's Network Settings

- 1 From the RST main page, press the **Network Setting** button.



The screenshot shows a window titled "IDentity 5100: Network Settings". It contains the following fields and controls:


- Mac Address: 00:17:9E:00:10:0C
- Serial Number: 04416500BE43CB6D
- Host Name: 00179E00100C.siri.com
- Enable DHCP
- Static Info section (indicated by a minus sign):
 - IP Address: 10.1.1.57
 - Subnet: 255.255.255.0
 - Default Gateway: 10.1.1.1
- Buttons: Apply and Cancel

- 2 Verify the **IP Address**, **Subnet**, and **Default Gateway** are correct.
- 3 If **Enable DHCP** is selected these fields will be locked.
- 4 If required, change the values and press **Apply**.

Reader Test Tool (RTT)

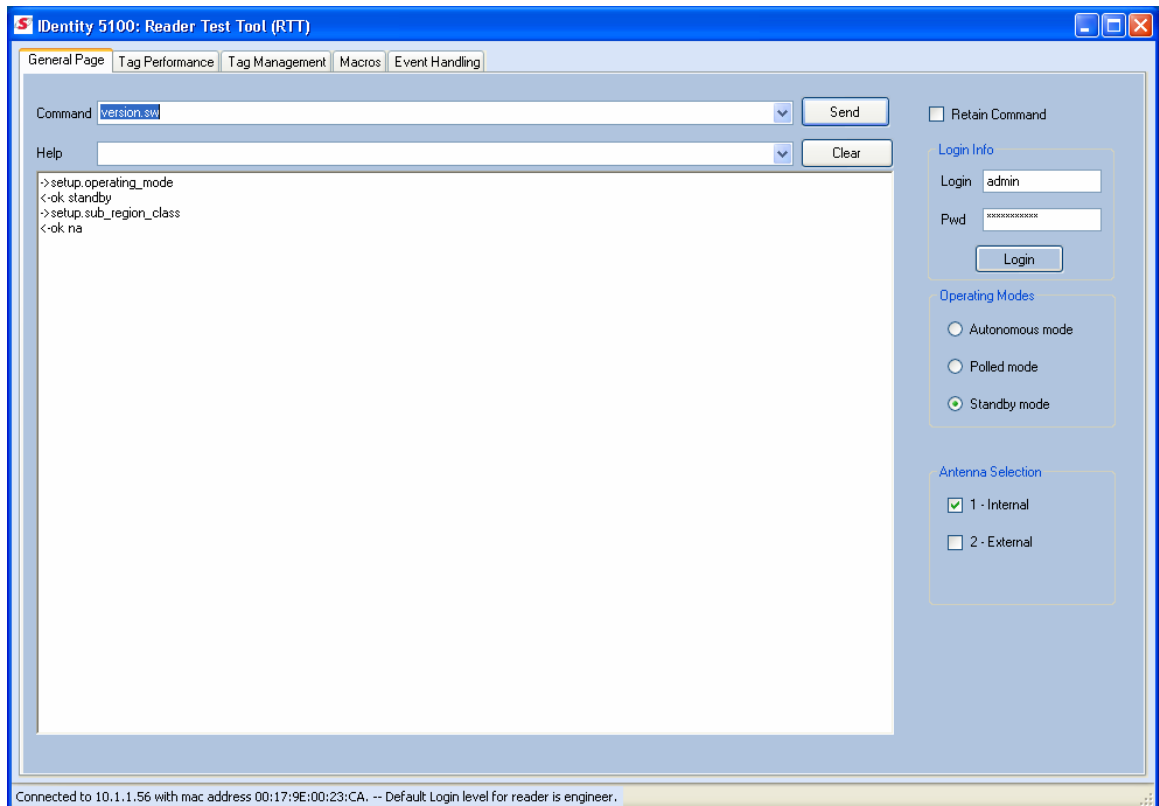
The Reader Test Tool (RTT) is primarily designed for new users to test reader operation and perform a few basic reader functions. With RTT, you can perform the following:

- Read tags
- Issue commands to the reader and view the responses
- Run macros
- Observe reader events

To access the Reader Test Tool, press the  button on the main RST page.

General Page

The **General Page** allows you to issue commands to the reader and view any responses. You can also change the operating mode and select antennas.

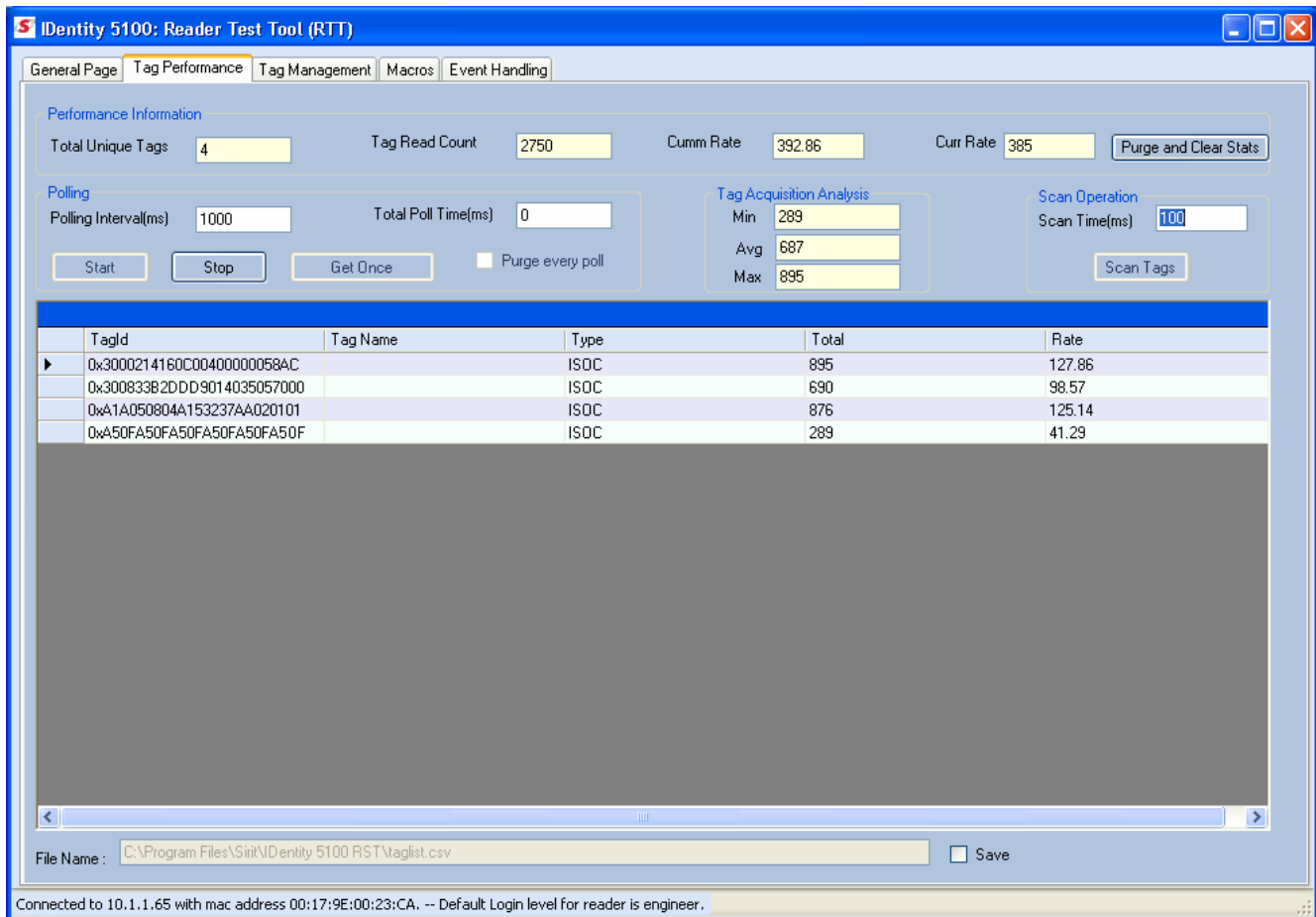


Tag Performance Page

The **Tag Performance** page is used to test the reader performance. This page is useful for range (distance) testing and to verify the RF field size.

To initiate a timed test, enter the length of test (in ms) into the **Total Poll Time** field. For example, to verify to number of tags read in a 30-second interval, enter 30000 and press the **Start** button. The test will complete after 30 seconds and the output statistics are updated for the poll time.

Output statistics are read-only and include: Total Unique Tags, Tag Read Count, Cumulative Rate, Current Rate.



Detailed descriptions of the various Tag Performance fields and functions are provided in the following sections.

Tag read controls are provided by the **Polling** and **Scan Operation** blocks. Use the **Polling** controls when the reader is in polled mode. Use the **Scan Operation** controls when the reader is in standby mode.

Tag and reader performance data is provided in the **Performance Information** and **Tag Acquisition Analysis** blocks.

Polling

Get Once – Click this button to retrieve the current information from the reader's tag database.

Start – Click this button to poll the tag database every **Polling Interval (ms)** for a total time of **Total Polled Time (ms)**. Do not set the interval less than 500. If Total Polled Time is set to 0, polling continues indefinitely.

Stop – Click this button to stop automatic polling.

Purge every poll – Check this option to purge the reader's tag database after each poll. Refer to the *IDentity 5100 Protocol Reference Guide* for more information on the tag database.

Scan Operation

Scan time (ms) – Enter the duration of reader operation in milliseconds. After this time expires, the tag information is displayed.

Scan Tags – Press this button to activate the reader.

Performance Information

Total Unique Tags – Number of unique tags in the tag database.

Tag Read Count – Total number of tags reader (including repeat reads).

Cumm rate – Cumulative read rate in tags/second since the **Start** button was pressed.

Curr rate – Current read rate in tags/second.

Tag Acquisition Analysis

The **Tag Acquisition Analysis** fields provide the minimum, maximum, and average number of times each tag was read. For example, assume five tags (A, B, C, D, and E) are read 107, 59, 223, 187, and 94 times respectively. The displayed values are as follows:

Min = 59

Avg = 134

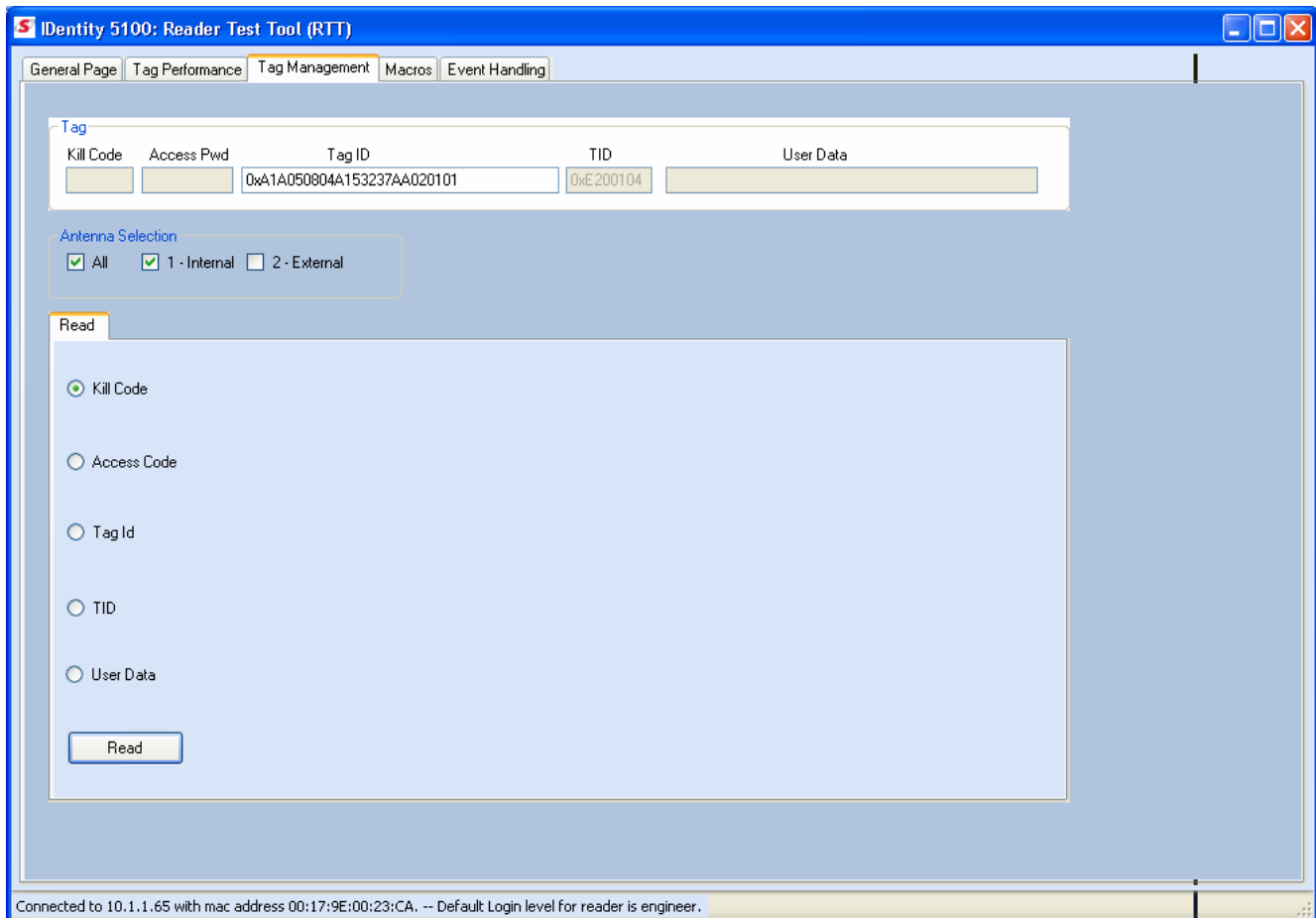
Max = 223

Tag Management Page

The **Tag Management** page is used for reading individual fields on a single tag. The **Read** button will cause the reader to singulate and read a tag in the selected antennas' RF field.

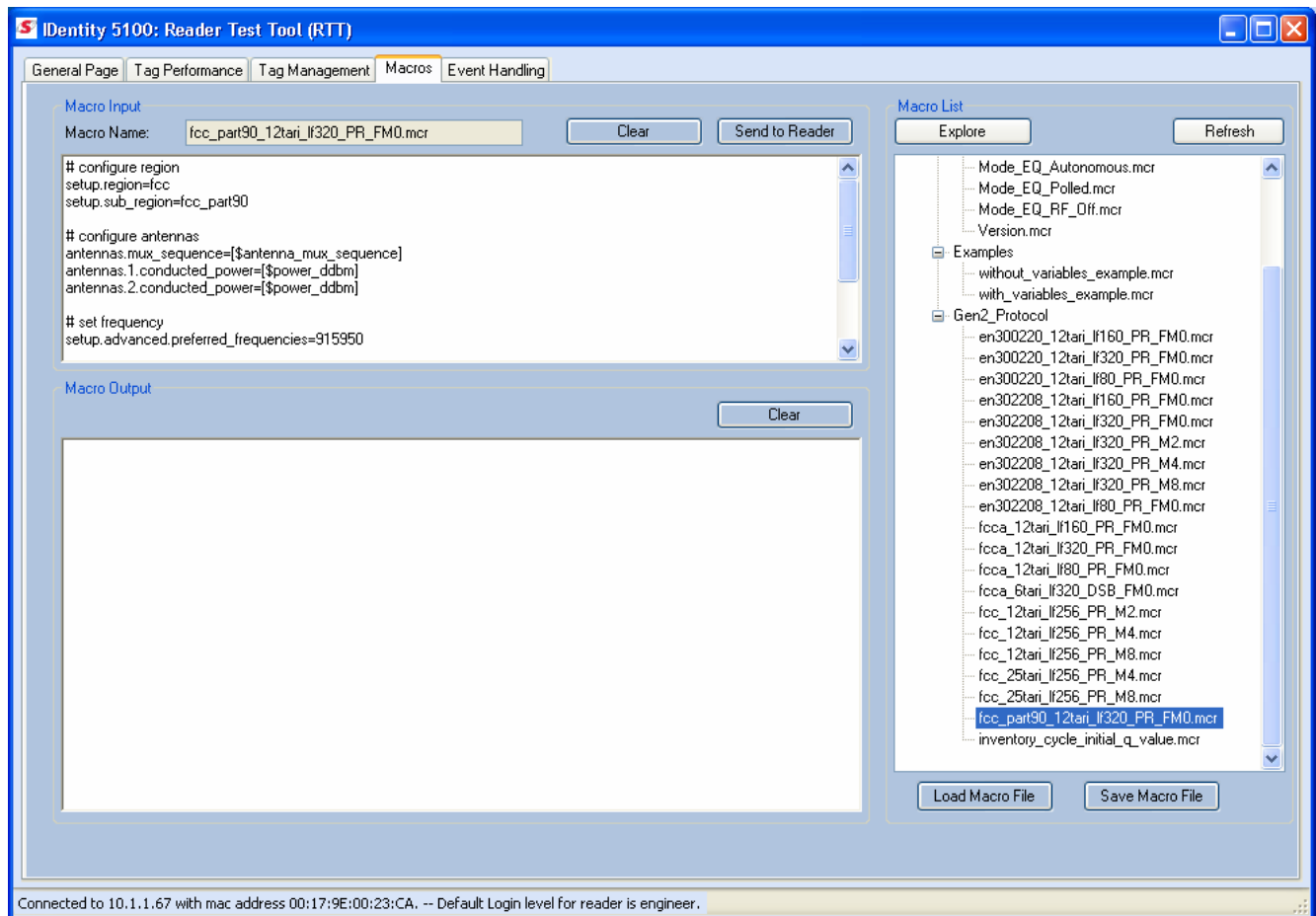
Specific fields you can read include:

- Kill Code
- Access Password
- Tag ID
- TID
- User Data



Macro Page

The **Macros** page allows the reader to manage macro files. The macros are provided by Sirit or can be written by the end user. Some of the macros provided are dependent on the operating region of the reader.



A macro (script or command file) is a text file that contains one or more reader commands. These commands are used to configure the reader to a known configuration. The Macros can contain variables. These variables are resolved by a dialog box (**FrmVariables**) that appears when the **Send to Reader** button is selected. The syntax of a variable is:

[\$variable_name]

During execution, the variable is replaced with user entries into the "FrmVariables" dialog box. Macros can be edited with any text editor including Windows Notepad.

Macro Input sub-window

The **Macro Input** window shows the current script that will be sent to the reader when the **Send to Reader** button is selected. The text in the **Macro Input** window can be edited prior to being sent to the reader. The **Save Macro File** button will prompt you for a filename to save the text to a file.

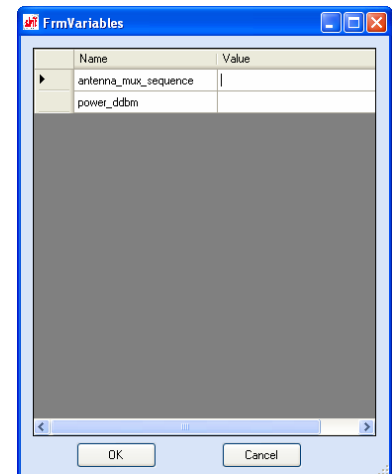
Macro Output sub-window

The **Macro Output** window is updated after the **Send to Reader** button is selected. Look at this window to verify that each command line in a script executed correctly. Look for the -- >> response from the reader for each command line.

FrmVariable Dialog box

When a macro is sent to the reader, the values for variables must be resolved via this Windows Dialog box. You can **[tab]** to each value field and enter the desired value.

For example, one macro can be used for two different applications by using variables for antenna selection and transmit power.



Macro Example

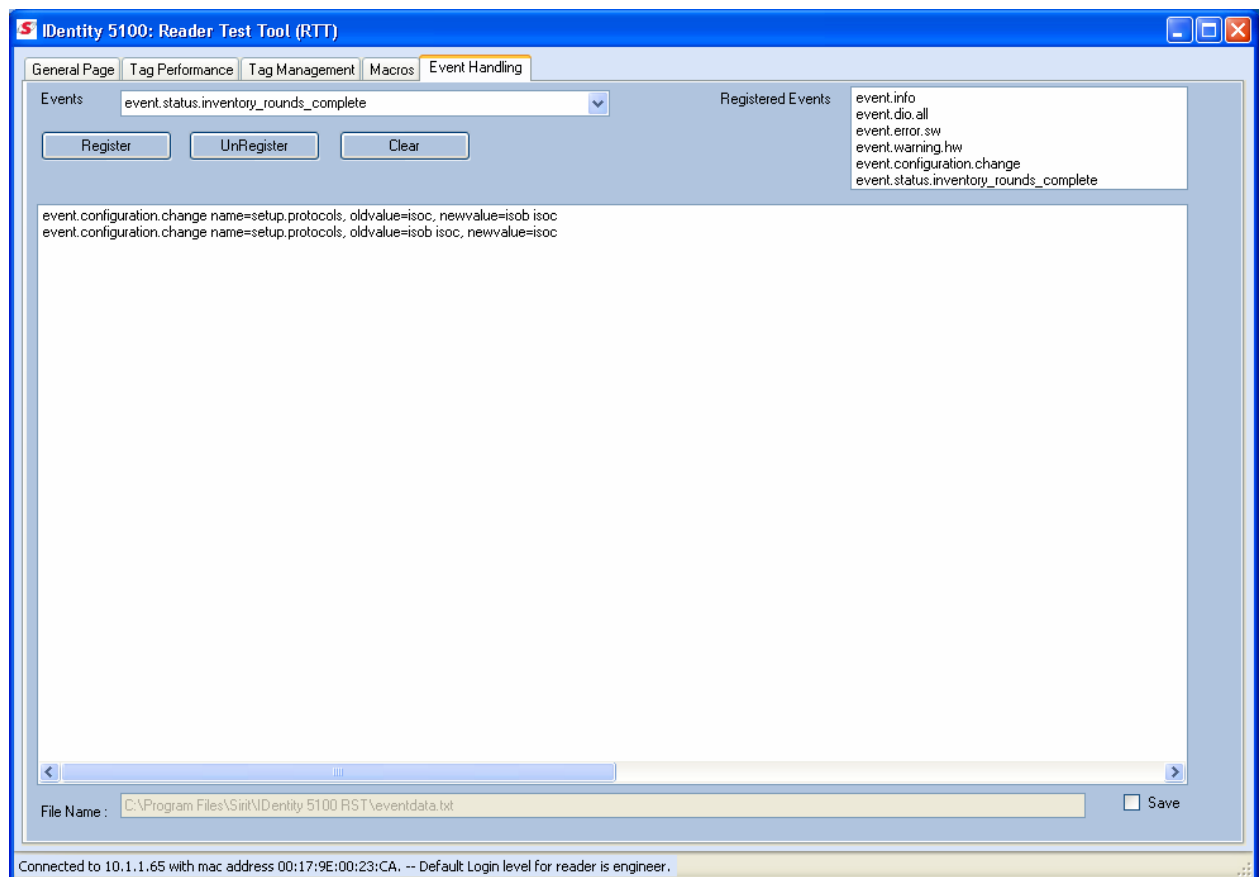
To configure the reader for single antenna FCC operation, send the following macro (**fcc_12tari_lf256_PR_M2.mcr**):

```
# configure region
setup.region=fcc
setup.sub_region=fcc_dense
antennas.mux_sequence=[$antenna_mux_sequence]
antennas.1.conducted_power=[$power_ddbm]
# configure protocol
modem.protocol.isoc.physical.set(tari=tari_12_50,
return_link_freq=LF256, data_1_length=d1_len_20,
rt_modulation=rt_mod_pr,
tr_encoding=tr_enc_miller_2,interrogator_mode=dense)
```

Event Handling Page

The **Event Handling** page allows you to register for Reader Events. After registration, events will be displayed as they occur in the window. Individual events or a group of events can be registered. Events are displayed with the newest event on the top line of the window. The least recent event will scroll to the bottom of the window.

For detailed information on individual events, refer to *Chapter 18 – Events Namespace* of the **IDentity 5100 Protocol Reference Guide**.



Registering for an individual event

To register for an individual event, either type the event name or select an event from a pull-down list.

Registering for a group of events

Registering for **event.error** events will cause the reader to autonomously send all events in the **event.error** namespace to the RTT program and be displayed in the window of this page. Enter **event.error** in the **Events:** field and press the **Register** button. The **Clear** button can be selected at any time to clear the window.

Reader Diagnostics Tool (RDT)

The Reader Diagnostic Tool (RDT) is to be used by Sirit trained technicians to troubleshoot and diagnose various reader issues.

Channel Statistics

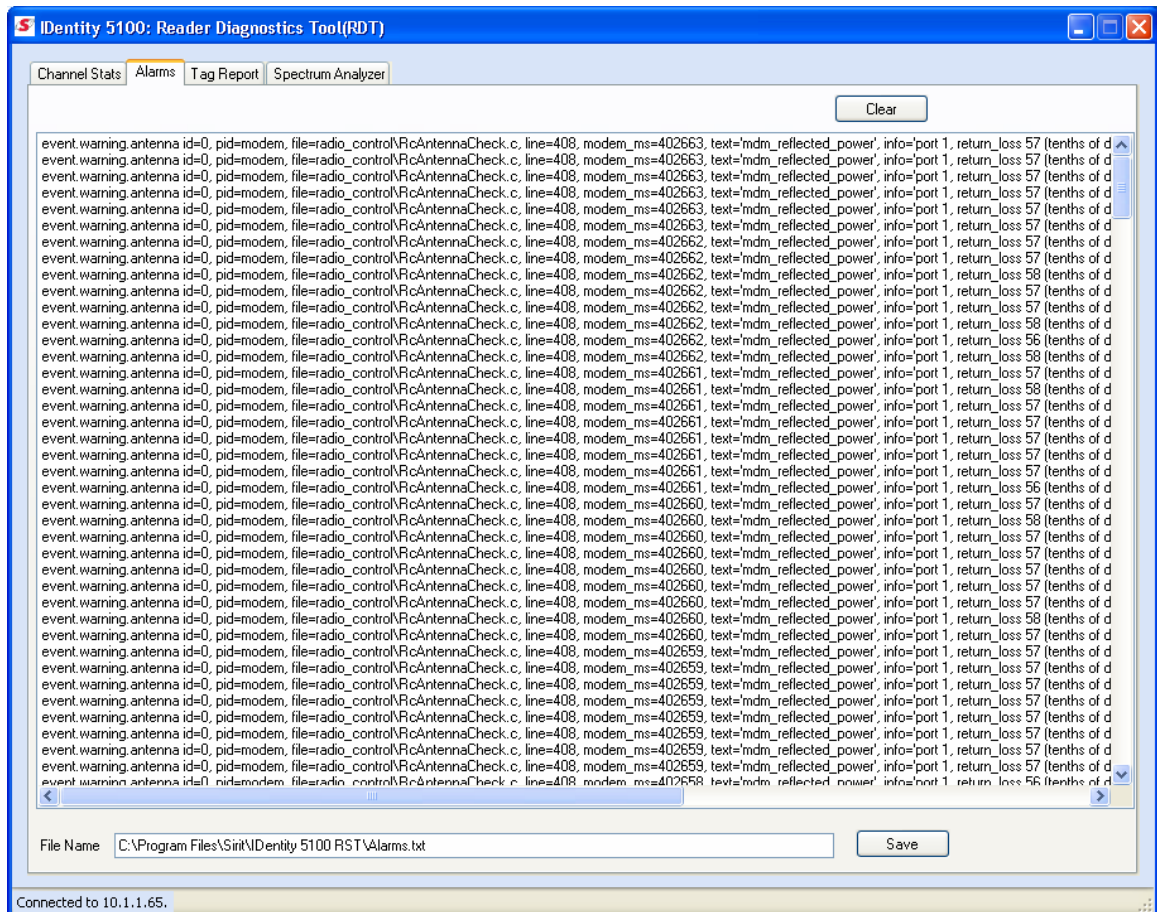
The **Channel Stats** page shows details of channel changes. This page is typically used to observe ETSI 302-208 Listen before Talk (LBT) behavior. It can also be used to observe FCC and other regional behavior.

Channel ID	Listen Count	Talk Count	Listen Time	Talk Time	Avg Listen Co	% Listen Tim
867100	22	44	238	850	0.5	21.88
867500	20	40	216	867	0.5	19.94
865700	22	45	236	930	0.49	20.24
866900	22	44	235	733	0.5	24.28
866300	23	46	247	877	0.5	21.98
865900	22	44	237	690	0.5	25.57
867300	23	46	247	916	0.5	21.24
866500	23	46	250	850	0.5	22.73
866700	21	42	227	790	0.5	22.32
866100	21	42	229	826	0.5	21.71

Alarms

The **Alarms** page is used to capture autonomous alarms generated by the reader during normal operation. The alarms are defined as autonomous reader events for the following namespaces:

```
event.error
event.warning
```

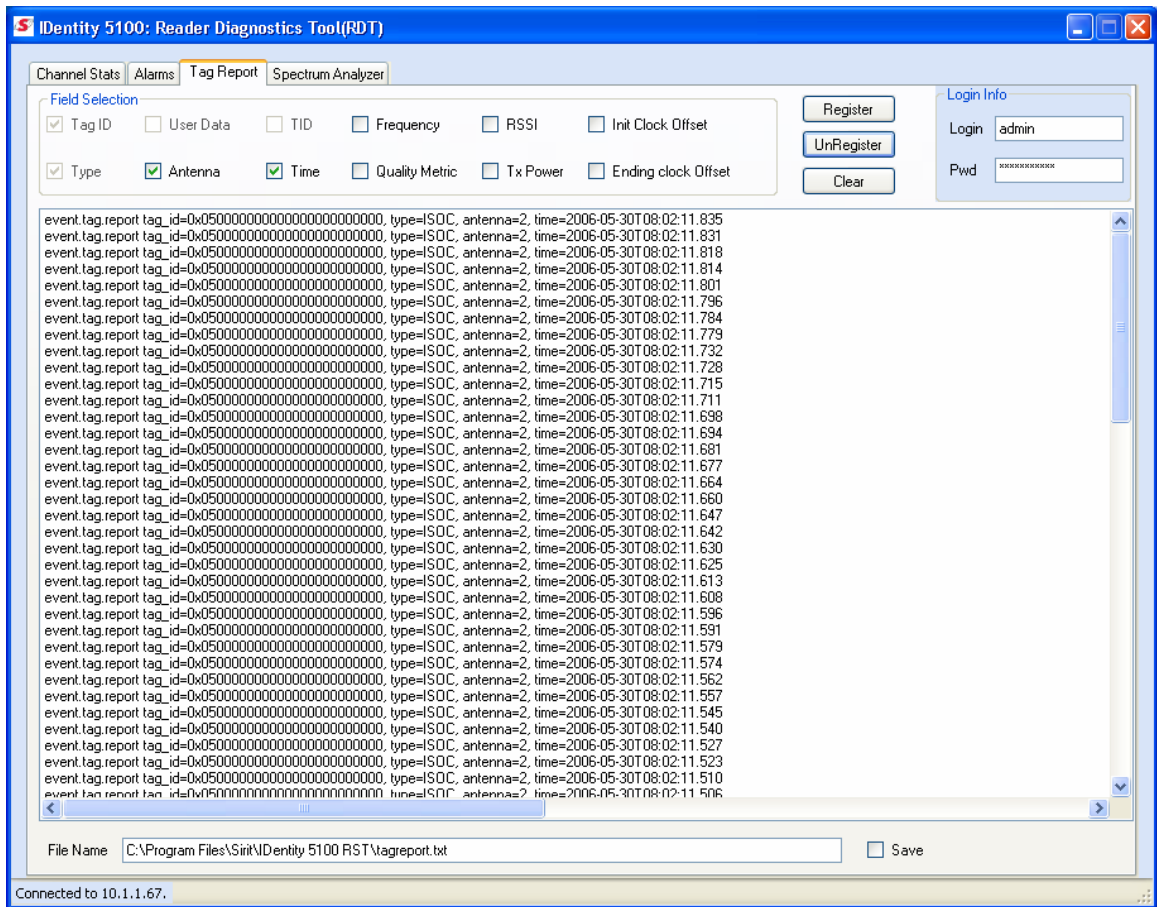


Tag Report

The Tag Report page is used to view specific information for each tag singulation. This feature provides detailed attributes of tag singulations such as tag power (RSSI) and on which antenna that tag singulated.



Caution: Use of this tool can adversely affect tag reader performance, particularly if many tag fields are enabled. Use the **RTT->Tag Performance** page for normal tag performance testing.



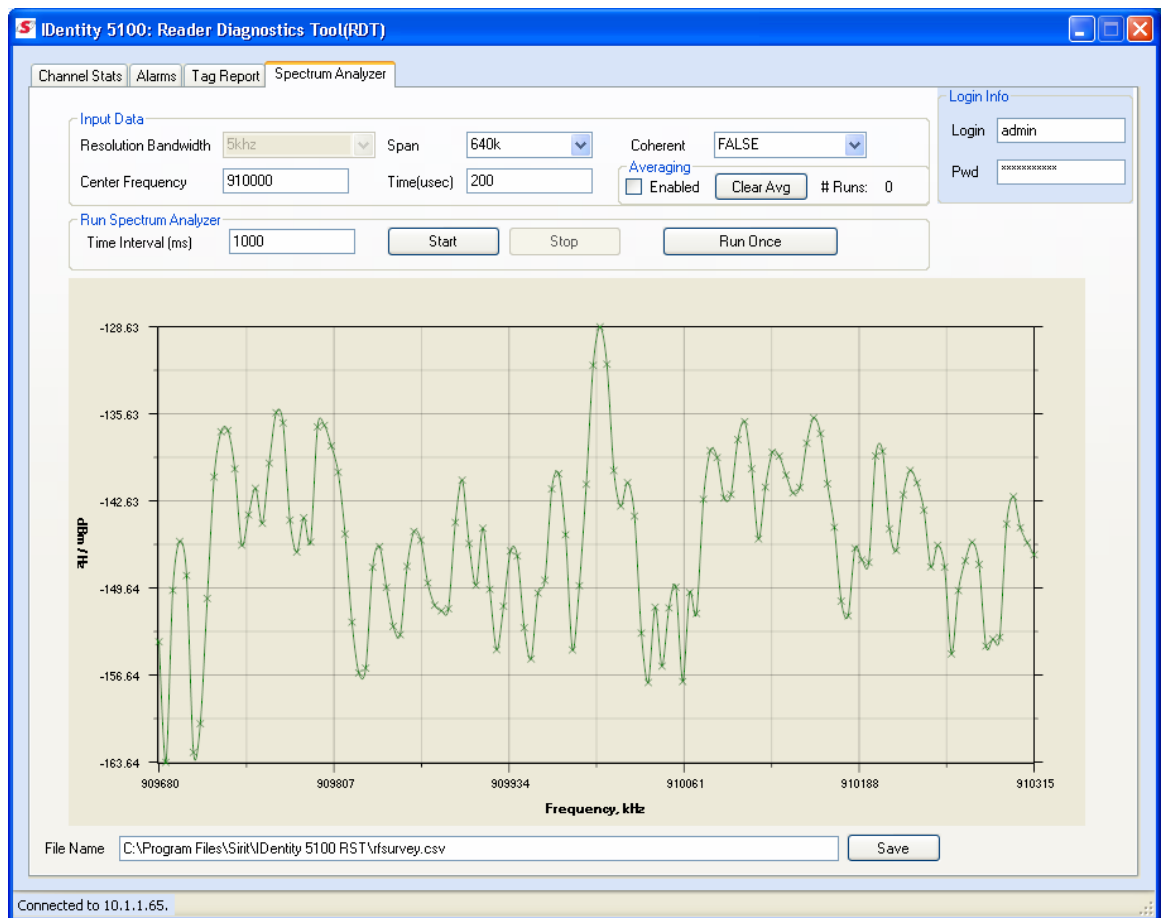
Spectrum Analyzer

The Spectrum Analyzer allows you to examine the spectral composition of the radio waves in your surrounding environment. This feature provides a graphical representation of the current spectral RF noise in units of dBm with a range of 0 to -120 dBm. This feature is intended for expert users to verify RF environmental conditions during an installation.

Set the **Center Frequency** and **Span** fields to view the desired range of frequencies. Leave the **Coherent** and **Time** fields at the default values.



Caution: Using this feature during normal reader operation can significantly degrade tag reading performance.



Embedded Reader Configuration Tool (RCT)

The Embedded Reader Configuration Tool (RCT) allows you to access your reader across a LAN or WAN by entering the reader's IP address into your web browser. With the RCT, you can fully configure your reader for operation in a variety of applications and environments. With this application, you can perform the following:

- Basic Configurations
- Advanced Configurations
- Check System Status
- Access the online Help

To access the RCT, press the [Configure](#) button on the main RST page.

The screenshot displays the IDentity 5100 Embedded Reader Configuration Tool (RCT) interface. At the top left, the text "IDentity 5100" is displayed in a blue serif font. To the right is the "sirit" logo in red, with the tagline "vision beyond sight™" below it. Below the header, there are two status bars: "Logged in as: guest" with a "Login" link, and "Current Profile: factory" with "Save" and "Manage Profiles" links. The main content area is divided into four panels, each with a gear icon and a title:

- Basic Configuration**
 - Manage Profiles
 - Set Tag Protocol
 - Setup Ethernet/LAN
 - Setup Serial Port
 - Setup Digital Accessories
 - Setup Antenna/Cables
 - Set Regulatory Mode (Region)
- Advanced Functions**
 - Firmware Management
 - Import/Export Configuration
 - Command Line
 - Expert Configuration
 - User Application Management
 - Change Operating Mode
 - Restart
- System Status**
 - View Tags
 - Check Reader Status
 - Review Logs
- Help**
 - About Reader
 - Troubleshooting

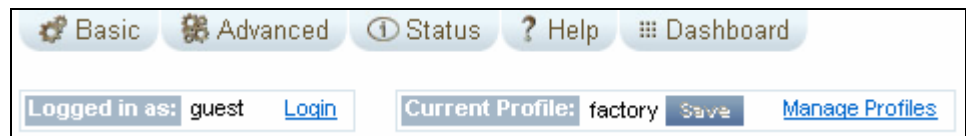
Basic Configuration

With the Basic Configuration functions you can perform the following:

- Manage reader profiles
- Set tag protocols
- Setup the Ethernet/LAN configuration
- Setup the serial port
- Setup digital accessories
- Setup antennas
- Set regulatory modes

Configuration Page Header

Each page displayed by the RCT has the following header.



This header provides pull-down menus for each of the configuration function categories. Additional functions include the user login and the currently loaded reader profile.

Login

The reader's default user level is **guest**. However, a user can login as **admin**. If not logged in as **admin**, the default level is always **guest**.

The guest login level provides read-only access to the reader. Clients that login in at the guest level can read the settings of the reader and can access the tags that the reader has inventoried. Clients at this level cannot change the configuration of the reader.

The admin login level provides read-write access to the reader. Clients that login in at the admin level can read and write the settings of the reader and can access the tags that the reader has inventoried.

Logout

After logging in as **admin**, the **Logout** button logs you out of the reader. Logging out automatically sets the login level to guest.

Profile:

Profile is the currently active profile in the reader. Refer to the *Manage Profiles* section for detailed information on reader profiles.

Save

The Save button saves the reader's current configuration to the specified profile. Refer to the *Manage Profiles* section for detailed information on reader profiles.

Manage Profiles

This link allows you to list, save, and delete profiles. Refer to the *Manage Profiles* section for detailed information on reader profiles.

Manage Profiles

The reader's configuration is stored in a profile. A profile contains the setting of all the configuration variables in the reader. The reader can support up to 8 unique profiles. Detailed information about reader profiles is provided in *Chapter 4 – Reader Behavior* of the **IDentity 5100 Protocol Reference Guide**.

The **Manage Profiles** page provides a list of all profiles stored in the reader.

Save Profile As :	<input type="text"/>	Save	
Profile Name	Save as	Delete	?
debug	Save	Delete	?
sample	Save	Delete	?

Save Profile As:

To save your current reader configuration as under a new profile, enter a profile name and press **Save**. The new profile will appear in the Profile Name list. Profile names must consist of the characters A - Z, a - z, 0 - 9, '-' or '_' and must be between 1 and 32 characters in length. The reader can store up to 8 different profiles.

Save Profile

To save your current configuration to an existing profile, press the **Save** button beside the profile name. After the next refresh the profile name will appear as the **Current** profile.

Delete Profile

This Delete button deletes the specified profile from the reader. This is a destructive operation. Once a profile is deleted, it cannot be recovered.

Profile Names
 The profile name **factory** is reserved and cannot be used. This profile is a read only profile.

Set Tag Protocol



Basic Configuration

- Manage Profiles
- **Set Tag Protocol**
- Setup Ethernet/LAN
- Setup Serial Port
- Setup Digital Accessories
- Setup Antenna/Cables
- Set Regulatory Mode (Region)

This **Set Tag Protocol** page consists of two forms. The first form (top) allows you to select which type of tags the reader will acquire or the type of protocol(s) to utilize on the air interface. Currently, the reader operates on ISO18000-6C tags.

The second form (bottom) allows you to configure various protocol level parameters. The protocol level parameters are divided into two categories: control and physical. Control parameters configure the protocol control. Physical parameters configure the physical air interface for the protocol.

Control		
Name	Value	?
Command Retried	<input type="text" value="3"/>	?
Display Tag CRC	<input type="text" value="false"/>	?
Inventory Antenna Switch	<input type="text" value="false"/>	?
Mem Bank For Selection	<input type="text" value="membank_epc"/>	?
Number Slots Q	<input type="text" value="4"/>	?
Select Cmd Period	<input type="text" value="0"/>	?
Session ID	<input type="text" value="session_1"/>	?
Use Block Write	<input type="text" value="false"/>	?

Physical		
Name	Value	?
Data 1 Length	<input type="text" value="d1_len_15"/>	?
Interrogator Mode	<input type="text" value="single"/>	?
Modulation Depth	<input type="text" value="90"/>	?
Pilot Tone	<input type="text" value="true"/>	?
Return Link Freq	<input type="text" value="lf320"/>	?
Reader to Tag Modulation	<input type="text" value="rt_mod_dsb"/>	?
Tari	<input type="text" value="tari_06_25"/>	?
Tag to Reader Encoding	<input type="text" value="tr_enc_fm0"/>	?

For detailed information on each of the Control and Physical parameters, refer to *Chapter 15 – Modem Namespace* of the **IDentity 5100 Protocol Reference Guide**. Parameter descriptions are provided in the `modem.protocol.isoc.control` and `modem.protocol.isoc.physical` configuration variable sections.

Setup Ethernet/LAN



Basic Configuration

- Manage Profiles
- Set Tag Protocol
- Setup Ethernet/LAN
- Setup Serial Port
- Setup Digital Accessories
- Setup Antenna/Cables
- Set Regulatory Mode (Region)

The Setup Ethernet/LAN page allows you to configure the network interface of the reader.

NOTE:

Always record the IP, Mac subnet, and default gateway addresses for your readers and keep this data in a safe location. You can use this data to reconfigure the network in the event of application failure or data loss.

General Settings		
Name	Value	?
Host Name	<input type="text" value="00179E002274"/>	?
Command Port	<input type="text" value="50007"/>	?
Event Port	<input type="text" value="50008"/>	?
Domain Name	<input type="text" value="sirit.com"/>	?
Ethernet Settings		
Name	Value	?
Mac Address	<input type="text" value="00:17:9E:00:22:74"/>	?
Enable DHCP	<input checked="" type="checkbox"/>	?
IP Address	<input type="text" value="10.1.1.56"/>	?
Subnet Mask	<input type="text" value="255.255.255.0"/>	?
Default Gateway	<input type="text" value="10.1.1.1"/>	?
Other Settings		
Name	Value	?
NTP Servers	<input type="text" value="10.2.0.1"/>	?
DNS Servers	<input type="text" value="10.1.1.2 10.1.1.18"/>	?
Domain List	<input type="text" value="sirit.com"/>	?
<input type="button" value="Submit"/> <input type="button" value="Reset"/>		

General Settings allow you to specify the host and domain name of the reader. The Command and Event Ports are also shown and are read-only.

Ethernet Settings allow you to configure the reader's IP address. If the reader is to automatically acquire its IP address, subnet mask and default gateway from a DHCP server, select **Enable DHCP**. To manually specify this information, deselect **Enable DHCP** and fill in the desired IP address, subnet mask and default gateway.

Other Settings allow you to configure the NTP servers the reader can contact to obtain the current time, DNS servers the reader can contact for domain name resolution, and the Domain list to resolve names to IP addresses.

Enter all the required information and press **Submit**.

Setup Serial Port



The Setup Serial Port function allows you to configure the serial port parameters. These parameters include:

- Baud rate
- Data bits
- Parity
- Echo
- Stop bits

Name	Value	?
Baudrate	115200 ▾	?
Data Bits	8 ▾	?
Parity	NONE ▾	?
Echo	true ▾	?
Stopbits	1 ▾	?

Use the pull-down menus to select a value and press **Submit** to update the reader.

Setup Digital Accessories

The Setup Digital Accessories function allows you to configure the Digital Inputs and Outputs on the reader.

-  **Basic Configuration**
- Manage Profiles
 - Set Tag Protocol
 - Setup Ethernet/LAN
 - Setup Serial Port
 - Setup Digital Accessories
 - Setup Antenna/Cables
 - Set Regulatory Mode (Region)

Digital Input			
Name	Current Value	Debounce	?
1	true ▾	30	?
2	true ▾	30	?
3	true ▾	30	?
4	true ▾	30	?

Digital Output		
Name	Current Value	?
1	false ▾	?
2	false ▾	?
3	false ▾	?
4	false ▾	?

Digital Input

The status of the four digital input values (1–4) can be seen in this window. The **Current Value** is not configurable and is shown as **true** or **false**. The Debounce value can be set and is in milliseconds.

Digital Output

The output value for each digital output can be set to **true** or **false**. Press the **Submit** button to send the appropriate commands to the reader to update the digital inputs and outputs.

Refer to the **IDentity 5100 Protocol Reference Guide** for more information on configuring the digital inputs and outputs.

Setup Antenna/Cables

Basic Configuration

- Manage Profiles
- Set Tag Protocol
- Setup Ethernet/LAN
- Setup Serial Port
- Setup Digital Accessories
- Setup Antenna/Cables
- Set Regulatory Mode (Region)

This page allows you to configure the properties of the reader’s antenna configuration. For detailed description of each of the antenna and cable variables, refer to Antenna Configuration in *Chapter 4 – Reader Behavior* of the **IDentity 5100 Protocol Reference Guide**.

Enter the appropriate values for each antenna parameter and press the **Submit** button to update the antenna and cable configuration.

Name	Value	?
Detected Antennas	<input type="text" value="12"/>	?
Port Count	<input type="text" value="2"/>	?
Mux Sequence	<input type="text" value="2"/>	?

1 - Internal 2 - External

This table provides information related to a selected antenna.

Name	Value	?
Conducted Power	<input type="text" value="300"/>	?
Attenuation	<input type="text" value="0"/>	?
Cable Loss	<input type="text" value="3"/>	?
Gain	<input type="text" value="130"/>	?
Gain Units	<input type="text" value="dbi"/>	?
Computed Conducted Power	<input type="text" value="0"/>	?

Antenna Setup
The reader is configured at the factory to operate with specific antennas.

Set Regulatory Mode (Region)

This page allows the user to configure the reader to meet the regulatory requirements for the geographic region where the reader is deployed. The sub-region sets the secondary regulatory mode for the geographic region where the reader is deployed.



Basic Configuration

- Manage Profiles
- Set Tag Protocol
- Setup Ethernet/LAN
- Setup Serial Port
- Setup Digital Accessories
- Setup Antenna/Cables
- Set Regulatory Mode (Region)

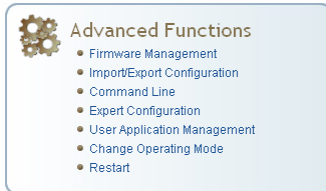
Region Selection

The reader is configured at the factory to operate within a specific regulatory region. As a result Region Selection is not user configurable.

Name	Value	?
Region	fcc	?
Sub Region	fcc_b	?

For detailed information on each of these parameters, refer to the **IDentity 5100 Protocol Reference Guide**. Descriptions are provided in the **setup.region** and **setup.sub_region** configuration variable sections.

Advanced Functions



With the Advanced Functions you can perform the following:

- Firmware Management
- Import/Export Configuration
- Command Line operations
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

Firmware Management

This page allows you to read the current firmware version, upgrade the reader firmware files, or rollback to the previous firmware version. Enter the name of the Sirit provided firmware file in the **Firmware File** field. Use the **Browse** button to help locate the file.

The **Rollback Firmware** button will roll back the firmware to the previous version.

Logged in as: admin [Logout](#) Current Profile: joe [Save](#) [Manage Profiles](#)

Firmware Management

Upgrade Firmware
Current Firmware version: 1.4.7987

Firmware File: [Browse...](#) [?](#)

[Upgrade Firmware](#)

Rollback Firmware
Firmware rollback version: 1.4.7969

[Rollback Firmware](#) [?](#)

Import/Export Configuration (Upload/Download)



Advanced Functions

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page allows you to transfer a reader configuration to or from your host computer. This is useful for configuring a reader to a known state.

Upload a Configuration File

Enter the name of a saved configuration file in the **Configuration file** field. Select the **XML File** option and press the **Upload Configuration** button to send the profile to the reader.

Download a Configuration File

This function is used to retrieve the reader settings for later uploading. Press the **XML Format** button to view the XML file. If you wish to view the current configuration parameters for a reader, press **Text Format** button.

Upload Configuration File

This page provides access to Command line interface of the reader.

Configuration file:

XML File Text File

Download Configuration File

Command Line



Advanced Functions

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart


This page allows you to directly enter reader commands from your web browser. To directly enter commands from the Command Line Interface (CLI), refer to the **IDentity 5100 Protocol Reference Guide**.

Command:

Response

```
ok
reader_uptime = 24183,
in_use_memory = 61427712,
free_memory = 2076672,
cpu_load = 2,
modem_alive = true,
modem_uptime = 24075,
antenna_status = ok,
tx_interlock = false,
synth_locked = true,
ps_fault = true
```

Expert Configuration



Advanced Functions

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart


The Expert Configuration functions allow you to configure low-level functions within the reader. These functions should only be accessed by expert users. Expert configurations include:

- Setup
- Tag
- Version
- Information
- Communication
- Antennas
- Digital I/O
- Modem

Expert Configuration – Setup

Name	Value	?
setup.default_login_level	<input type="text" value="admin"/>	?
setup.install_type	<input type="text" value="vehicle"/>	?
setup.operating_mode	<input type="text" value="standby"/>	?
setup.protocols	<input type="text" value="isoc"/>	?
setup.region	<input type="text" value="fcc"/>	?
setup.sub_region	<input type="text" value="fcc_dense"/>	?
setup.sub_region_class	<input type="text" value="na"/>	?
setup.tag_volume	<input type="text" value="1_4"/>	?
setup.valid_regions	<input type="text" value="fcc etsi"/>	?
setup.valid_sub_regions	<input type="text" value="fcc_a fcc_b fcc_c fcc_dense fcc_part90"/>	?
setup.advanced.preferred_frequencies	<input type="text" value="0"/>	?

Expert Configuration – Tag

 **Advanced Functions**

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page allows you to configure how the reader reports tags.

The *IDentity* 5100 supports the ability to filter tags. Filtering tags means to eliminate tags from being reported based on the conditions specified in the filter configuration variables. The reader supports eight filters and each filter is specified by the following configuration variables:

- enabled – Enables or disables the filter.
- inclusive – Indicates to either include tags that match (Inclusive) or include tags that do not match (Exclusive) the tag filter.
- mask – Mask (as an array of hex bytes) for the tag filter.
- name – Name given to the tag filter
- pattern – Pattern (as an array of hex bytes) for the tag filter

Name	Value	?
tag.db.max_count	<input type="text" value="10000"/>	?
tag.filter.1.enabled	<input type="text" value="false"/>	?
tag.filter.1.inclusive	<input type="text" value="true"/>	?
tag.filter.1.mask	<input type="text" value="00"/>	?
tag.filter.1.name	<input type="text"/>	?
tag.filter.1.pattern	<input type="text" value="00"/>	?
tag.filter.2.enabled	<input type="text" value="false"/>	?
tag.filter.2.inclusive	<input type="text" value="true"/>	?
tag.filter.2.mask	<input type="text" value="00"/>	?
tag.filter.2.name	<input type="text"/>	?
tag.filter.2.pattern	<input type="text" value="00"/>	?
tag.reporting.arrive_fields	<input type="text" value="tag_id time type antenna"/>	?
tag.reporting.depart_fields	<input type="text" value="tag_id"/>	?
tag.reporting.depart_time	<input type="text" value="1000"/>	?
tag.reporting.report_fields	<input type="text" value="tag_id"/>	?
tag.reporting.taglist_fields	<input type="text" value="tag_id"/>	?

Expert Configuration – Version



Advanced Functions

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page displays the version of reader hardware and reader software within the reader. The version numbers are read-only and will be needed if you contact Sirit for technical support.


Name	Value	?
version.hw	<input type="text" value="C"/>	?
version.hw_detail	<input type="text" value="hw = 0x0003, rf_assembly = KX0070, rf_serial_number ="/>	?
version.rollback	<input type="text" value="1.4.7969"/>	?
version.sw	<input type="text" value="1.4.7987"/>	?
version.sw_detail	<input type="text" value="sw = 1.4.7987, fw = 0.5, dsp = 7987, fpga = 0x3006"/>	?

Expert Configuration – Information

This page allows you to customize the reader's identity. You can assign each reader a name, description, location, and zone. You can also set how the reader reports timestamps.



















Name	Value	?
info.description	<input type="text" value="unknown"/>	?
info.location	<input type="text" value="unknown"/>	?
info.make	<input type="text" value="IDentity"/>	?
info.manufacturer	<input type="text" value="Sirit"/>	?
info.manufacturer_description	<input type="text" value="Sirit Technologies"/>	?
info.model	<input type="text" value="5100"/>	?
info.name	<input type="text" value="unknown"/>	?
info.serial_number	<input type="text" value="232520004445C24A"/>	?
info.time	<input type="text" value="2006-05-15T09:40:21.399"/>	?
info.time_reporting	<input type="text" value="local"/>	?
info.zone	<input type="text" value="unknown"/>	?

Expert Configuration – Communication

 **Advanced Functions**

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page allows you to customize the reader’s communication parameters. Refer to the **Setup Ethernet/LAN** and **Setup Serial Port** sections for additional information.

Name	Value	
com.event.overflow_backoff_time	<input type="text" value="3"/>	
com.network.dns_servers	<input type="text" value="10.1.1.2"/>	
com.network.domain_list	<input type="text" value="sirit.com"/>	
com.network.domainname	<input type="text" value="sirit.com"/>	
com.network.hostname	<input type="text" value="sirit_com_host"/>	
com.network.ntp_servers	<input type="text"/>	
com.network.1.default_gateway	<input type="text" value="10.1.1.254"/>	
com.network.1.ip_address	<input type="text" value="10.1.1.57"/>	
com.network.1.mac_address	<input type="text" value="00:17:9E:00:01:1E"/>	
com.network.1.method	<input type="text" value="dhcp"/>	
com.network.1.subnet_mask	<input type="text" value="255.255.255.0"/>	
com.serial.baudrate	<input type="text" value="115200"/>	
com.serial.databits	<input type="text" value="8"/>	
com.serial.echo	<input type="text" value="true"/>	
com.serial.parity	<input type="text" value="none"/>	
com.serial.rawmode	<input type="text" value="false"/>	
com.serial.stopbits	<input type="text" value="1"/>	

Expert Configuration – Antennas



Advanced Functions


- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page allows you to configure the properties of the reader’s antenna configuration. For detailed description of each of the antenna and cable variables, refer to the Antenna Configuration section in *Chapter 4 – Reader Behavior* of the **IDentity 5100 Protocol Reference Guide**.

Enter the appropriate values for each antenna parameter and press the **Submit** button to update the antenna and cable configuration.

Name	Value	?
antennas.detected	<input type="text" value="1 2"/>	?
antennas.mux_sequence	<input type="text" value="2"/>	?
antennas.port_count	<input type="text" value="2"/>	?
antennas.1.conducted_power	<input type="text" value="0"/>	?
antennas.1.advanced.attenuation	<input type="text" value="0"/>	?
antennas.1.advanced.cable_loss	<input type="text" value="3"/>	?
antennas.1.advanced.computed_conducted_power	<input type="text" value="233"/>	?
antennas.1.advanced.gain	<input type="text" value="130"/>	?
antennas.1.advanced.gain_units	<input type="text" value="dbi"/>	?
antennas.2.conducted_power	<input type="text" value="0"/>	?
antennas.2.advanced.attenuation	<input type="text" value="0"/>	?
antennas.2.advanced.cable_loss	<input type="text" value="10"/>	?
antennas.2.advanced.computed_conducted_power	<input type="text" value="240"/>	?
antennas.2.advanced.gain	<input type="text" value="130"/>	?
antennas.2.advanced.gain_units	<input type="text" value="dbi"/>	?
antennas.check.time	<input type="text" value="10000"/>	?
antennas.check.type	<input type="text" value="timed"/>	?
antennas.lbt.listen_port	<input type="text" value="lbt_antenna_all"/>	?

Expert Configuration – Digital I/O

 **Advanced Functions**

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

If the reader is equipped with digital inputs and outputs, this page allows you to configure the digital inputs and output behavior. You can set the digital input debounce time (in milliseconds), as well as the input and output pin values. Refer to the **IDentity 5100 Protocol Reference Guide** for detailed information on each of these variables.

Name	Value	?
dio.debounce.1	<input type="text" value="30"/>	?
dio.debounce.2	<input type="text" value="30"/>	?
dio.debounce.3	<input type="text" value="30"/>	?
dio.debounce.4	<input type="text" value="30"/>	?
dio.in.1	<input type="text" value="1"/>	?
dio.in.2	<input type="text" value="1"/>	?
dio.in.3	<input type="text" value="1"/>	?
dio.in.4	<input type="text" value="1"/>	?
dio.in.all	<input type="text" value="0xF"/>	?
dio.out.1	<input type="text" value="0"/>	?
dio.out.2	<input type="text" value="0"/>	?
dio.out.3	<input type="text" value="0"/>	?
dio.out.4	<input type="text" value="0"/>	?
dio.out.all	<input type="text" value="0x0"/>	?

Expert Configuration – Modem



Advanced Functions

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page allows you to set the reader’s modem control variables. These variables control functions such as EPC link, modulation depth, return link frequency, and others. Refer to the **Identity 5100 Protocol Reference Guide** for detailed information on each of these variables.

Name	Value	?
modem.control.low_power	<input type="text" value="fullpower"/>	?
modem.debug.db0	<input type="text" value="0"/>	?
modem.debug.db1	<input type="text" value="0"/>	?
modem.debug.db2	<input type="text" value="0"/>	?
modem.debug.db3	<input type="text" value="0"/>	?
modem.debug.db4	<input type="text" value="0"/>	?
modem.debug.db5	<input type="text" value="0"/>	?
modem.debug.db6	<input type="text" value="0"/>	?
modem.debug.db7	<input type="text" value="0"/>	?
modem.debug.db8	<input type="text" value="0"/>	?
modem.debug.db9	<input type="text" value="52030"/>	?
modem.debug.wireless_sync.atten	<input type="text" value="0"/>	?
modem.debug.wireless_sync.threshold	<input type="text" value="1500"/>	?
modem.debug.wireless_sync.vmag	<input type="text" value="0"/>	?
modem.radio.lbt.type	<input type="text" value="standard"/>	?
modem.radio.lbt.random_time.enabled	<input type="text" value="true"/>	?
modem.radio.tg34.test_mode	<input type="text" value="none"/>	?
modem.radio.tx.interlock	<input type="text" value="false"/>	?
modem.stats.time	<input type="text" value="-1"/>	?
modem.stats.uptime	<input type="text" value="856"/>	?

User Application Management



Advanced Functions

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page lists any user applications currently available on the reader and if any applications are running. This page also allows you to upload scripts to the reader.

Running User Applications

There are no user applications running on the reader.

Application Transfer

Application to Transfer:

Applications available on the reader

Application Name	View	Delete
signal_read_crc_error.py ▾	<input type="button" value="View"/>	<input type="button" value="Delete"/>

Start Applications

Type	Name	Options	Autostart	Submit
Python Applications	signal_read_crc_error.py ▾	<input type="text"/>	False ▾	<input type="button" value="Go"/>
Java Applications	TowersOfHanoi ▾	<input type="text"/>	False ▾	<input type="button" value="Go"/>

- **Running User Applications** – Lists any user applications currently running on the reader. The application name, process ID, configuration, and status are provided. Controls are provided to view the application file and stop the application.
- **Application Transfer** – This function allows you to load custom user applications onto the reader.
- **Applications available on the reader** – This function allows you to view a list of all user applications stored on the reader. Controls are provided to view the application and delete it from the reader.
- **Start Applications** – This function allows you to start Python and Java applications.

Change Operating Mode



Advanced Functions

- Firmware Management
- Import/Export Configuration
- Command Line
- Expert Configuration
- User Application Management
- Change Operating Mode
- Restart

This page allows you to configure the operational mode of the reader.

Select	Operating Mode	?
<input checked="" type="radio"/>	Autonomous Mode	?
<input type="radio"/>	Polled Mode	?
<input type="radio"/>	Stand By Mode	?

Save

The reader supports the following operational modes:

- ▶ **autonomous** - Reader is continuously attempting to singulate tags and automatically reports any singulated tag via an asynchronous event notification on the event channel.
- ▶ **polled** - Reader is continuously attempting to singulate tags. The reader stores the singulated tags in the tag database and a single entry is maintained for each unique tag.
- ▶ **standby** - Reader is not transmitting any energy, unless processing a tag related command. The RF transmitter is enabled at the beginning of the command processing, any protocol operations required for the command are performed, and then the RF transmitter is turned back off.

View Tags

System Status

- View Tags
- Check Reader Status
- Review Logs

All tags read by the reader are stored in a database on the reader. This page allows you to view the tags in the database as well as change the current Operating Mode (**standby**, **autonomous**, or **polled**).

Press **Start** to begin displaying the tag database. This page is automatically refreshed every five seconds. Press **Get Once** to update the database one time (refresh is off). Press **Purge** to purge all tags from the database.

Reader Operating Mode

The current reader operating mode is displayed as the default item in the pulldown list. To change the operating mode, highlight and select the desired mode from the list.

polled ?

Tag Database Display

Click on the 'Start' button to begin a display of the reader tag database and continuously refresh the display every 5 seconds. The 'Stop' button stops updating the display of the reader tag database. The 'Get Once' button can be used to display the reader tag database a single time. The 'Purge' button purges all tags from the reader tag database.

Tag ID	Protocol	Antenna	Repeat Counts	First Read Time	Last Read Time
0xE20034110000F99390333446	ISOC	1	15173	2006-05-02T21:52:42.277	2006-05-02T21:54:24.547
0xE20034110000F99390333335	ISOC	1	14823	2006-05-02T21:52:42.275	2006-05-02T21:54:24.547
0xE20034110000F99390333320	ISOC	1	15399	2006-05-02T21:52:42.276	2006-05-02T21:54:24.547

Start
Stop
Get Once
Purge

Check Reader Status

i System Status

- View Tags
- Check Reader Status
- Review Logs

This page allows you to view the reader status. This information can be used by Sirit Technical Support to verify reader operation.

Status
in_use_memory:51519488
tx_interlock:false
synth_locked:true
modem_uptime:1236
reader_uptime:1251
free_memory:11984896
ps_fault:true
antenna_status:ok
cpu_load:7
modem_alive:true
discservice.py is alive, pid=963
reader is alive, pid=936
sshd is alive, pid=932
ntpd is stopped

Review Logs

This page allows you to view the reader logs. These logs can be used by Sirit Technical Support to verify reader operation. The reader logs include:

- **Reader level Logs** – System level reader operation
- **System Level Logs** – Linux logs
- **Firmware Update Log** – System level
- **Reader Applications Log** – User application logs

System Status	
This page shows current status of the system.	
Number	Log Type
1	Reader level Logs
2	System Level Logs
3	Firmware Update Log
4	Reader Applications Log

Configuring Digital Inputs and Outputs

Digital Inputs

The digital inputs (DIN1 – DIN4) can be used as general purpose inputs or to trigger the reader for tag reading. Unused or open digital inputs are floating inside the reader.

To activate the input, pull it low (0 Vdc) with an external device or connection to ground that can sink 2.5 mA. No voltage higher than +24 Vdc or lower than 0 Vdc should ever be connected to the input. See Figure 5 for an example of a typical motion sensor installed as a tag read trigger device.

Digital Outputs

The digital outputs (DOUT1 – DOUT4) can be used as general purpose outputs, to indicate tag reading activity, or to indicate the reader is transmitting (RF On). Digital outputs can be pulled high.

No voltage higher than +40 Vdc or lower than 0 Vdc should ever be connected to a digital output. The reader activates the output by pulling it low (0 Vdc) and can sink current such that power dissipation is $\leq 1W$.

Digital I/O Monitoring and Control Scripts

Several digital I/O monitoring and control scripts are provided with the reader to allow you to monitor the digital I/Os and take specific actions. These Python application scripts can be used as is or modified to suit your particular application. For detailed information on loading Python scripts, refer to *Chapter 5 – Embedded Reader Applications* of the **IDentity 5100 Protocol Reference Guide**.

scan_trigger.py

This routine monitors the state of the digital input pin specified as the input parameter. If the state of the pin is low, the operating mode is set to standby. If the I/O pin state changes to high, the operating mode is set to polled.

Inputs: *<pin>* – (optional) Input pin number (1–4). Default is digital in 1.

<trigger logic level> –(optional) 0 or 1. Default is trigger on 1.

Examples:

<code>scan_trigger.py</code>	Monitors digital input pin 1
<code>scan_trigger.py 1</code>	Monitors digital input pin 1
<code>scan_trigger.py 4</code>	Monitors digital input pin 4
<code>scan_trigger.py 3 0</code>	Monitors digital input pin 3, trigger on 0

scan_trigger_timer.py

This routine monitors the I/O pin. When the pen goes high, the timer is started and the operating mode is set to *polled*. While the timer is running, I/O pin state changes are ignored. When the timer expires, the operating mode is set to *standby*. The minimum value for the timer is 10 milliseconds (ms).

Inputs: *<pin>* – (optional) Output pin number (1–4). Default is output 1.

<time> – (optional) Time, in ms for timer to run. Default is 1000 ms.

<trigger logic level> –(optional) 0 or 1. Default is trigger on 1.

Examples:

<code>scan_trigger_timer.py</code>	Monitors input 1, timer 1000 ms, trigger on 1
<code>scan_trigger_timer.py 2</code>	Monitors input 2, timer 1000 ms, trigger on 1
<code>scan_trigger_timer.py 4 2000</code>	Monitors input 4, timer 2000 ms, trigger on 1
<code>scan_trigger_timer.py 3 4000 0</code>	Monitors digital input 3, timer 4000 ms, trigger on 0

signal_read.py

This routine will activate a digital output if a tag is successfully read. The optional output pin number can be specified on the command line. If not specified, output pin 1 is selected and a default value of 1000 milliseconds is used. The output will remain high for *n* ms, where *n* is either the default of 1000 ms, or the value supplied on the command line. Minimum value for *n* is 10 ms.

Inputs: *<pin>* – (optional) Output pin number (1–4). Default is output 1.

<time> – (optional) Time, in ms, to keep the output high. Default is 1000 ms (1 sec).

<logic level> – (optional) Logic level for digital out *On*. 0 or 1. Default is 1 (*On*).

Examples:

<code>signal_read.py</code>	Turns on output 1 for 1000 ms on tag reads
<code>signal_read.py 2</code>	Turns on output 2 for 1000 ms on tag reads
<code>signal_read.py 1 5000</code>	Turns on output 1 for 5000 ms on tag reads
<code>signal_read.py 1 500</code>	Turns on output 1 for 500 ms on tag reads
<code>signal_read.py 1 800 0</code>	Turns on digital output 1, logic level 0, for 800 ms on tag reads

signal_read_crc_error.py

This routine will turn on a digital output if a tag read CRC error is detected. The output pin number can be specified on the command line. If not specified, output pin 1 is used. The output pin will remain high for *n* ms, where *n* is either the default of 1000 ms or the value supplied on the command line. Minimum value for *n* is 10 ms.

Inputs: *<pin>* – (optional) Output pin number (1–4). Default is output 1.
<time> – (optional) Time, in ms, to keep the output high. Default is 1000 ms.
<logic level> – (optional) Logic level for digital out *On*. 0 or 1. Default is 1 (*On*).

Examples:

<code>signal_read_crc_error.py</code>	Turns on output 1, logic level 1 for on for 1000 ms on tag read CRC error.
<code>signal_read_crc_error.py 2</code>	Turns on output 2, logic level 1 for on for 1000 ms on tag read CRC error.
<code>signal_read_crc_error.py 1 5000</code>	Turns on output 1, logic level 1 for on for 5000 ms on tag read CRC error.
<code>signal_read_crc_error.py 1 500</code>	Turns on output 1, logic level 1 for on for 500 ms on tag read CRC error.
<code>signal_read_crc_error.py 1 800 0</code>	Turns on output 1, logic level 0 for on, for 800 ms on tag CRC error.

rf_mon.py

This routine will monitor the state of the transmitter. If the transmitter is on, it sets the appropriate output pin high. If low, it sets the output pin low.

Inputs: *<pin>* – (optional) Output pin number (1–4). Default is output 1.
<logic level> – (optional) Logic level for digital out *On*. 0 or 1. Default is 1 (*On*).

Examples:

<code>rf_mon.py</code>	Monitors RF status, set/clear output 1 on change, logic level 1 for on
<code>rf_mon.py 1</code>	Monitors RF status, set/clear output 1 on change, logic level 1 for on
<code>rf_mon.py 2</code>	Monitors RF status, set/clear output 2 on change, logic level 1 for on
<code>rf_mon.py 3 0</code>	Monitors RF status, set/clear output 3 on change, logic level 0 for on

Digital Input Alarm Generation

The IDentity 5100 can be configured to generate an alarm when a digital input is disconnected or sensor failure is detected. The alarm is triggered when the signal level on the digital input stays in the specified state longer than the specified alarm timeout. This behavior can be configured independently for each digital input.

The configuration variable **dio.in.alarm.logic_level.<N>** (where <N> is 1,2,3,4) sets whether the alarm is coupled to a input logic level of 0 (low) or 1 (high).

The configuration variable **dio.in.alarm.timeout.<N>** (where <N> is 1,2,3,4) sets the amount of time, in seconds, to wait for a signal state change. A value of 0 (default) disables alarm generation.

The digital input logic level is used along with the corresponding digital input pin timeout value to determine if an alarm (in the form of an event) should be generated. If a timeout value is set, the input pin is monitored. If the input pin value does not change during the timeout period AND the input pin value matches the alarm logic level, the event **event.dio.in.alarm.timeout.n** (where n is the pin number) is generated. This alarm event generation can be helpful in alerting to the loss of digital inputs to the reader.

Digital I/O Hardware Connection

Figure 5 shows a typical sensor/indicator connection to the digital I/Os.

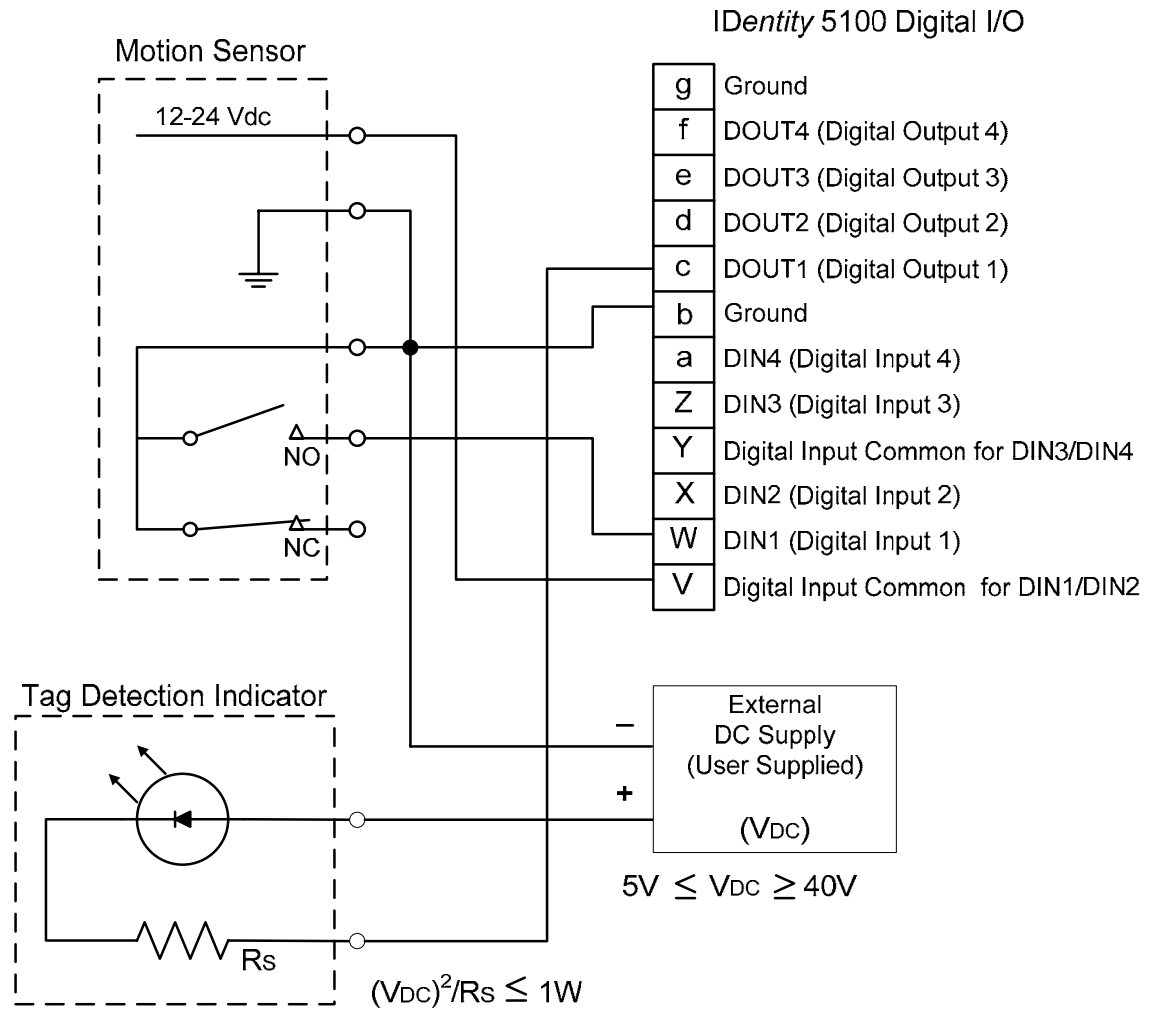


Figure 5 Example Motion Detector and Indicator connected to the Digital I/O

Specifications

Reader Specifications

Frequency Range	860–960 MHz (Factory configured for specific region)
FCC Part 15	902–928 MHz
FCC Part 90	910.950 911.200 911.450 911.700 911.950 912.200 912.450 912.700 912.950 913.200 913.450 913.700 913.950 914.200 914.450 914.700 914.950 915.200 915.450 915.700 915.950 916.200 916.450 916.700 916.950 917.200 917.450 917.700 917.950 918.200 918.450 918.700 918.950 919.200 919.450 919.700 919.950 920.200 920.450 MHz
RF Power	10 mW – 1W conducted (30 dBm)
Power Consumption	13W (typical while idle) 34W (typical at 1W conducted output power) 40W (maximum at 1W conducted output power)
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
Size	17.7 x 17.7 x 4.1 in (450 x 450 x 105 mm)
Weight	15.0 pounds (6.8 kg)

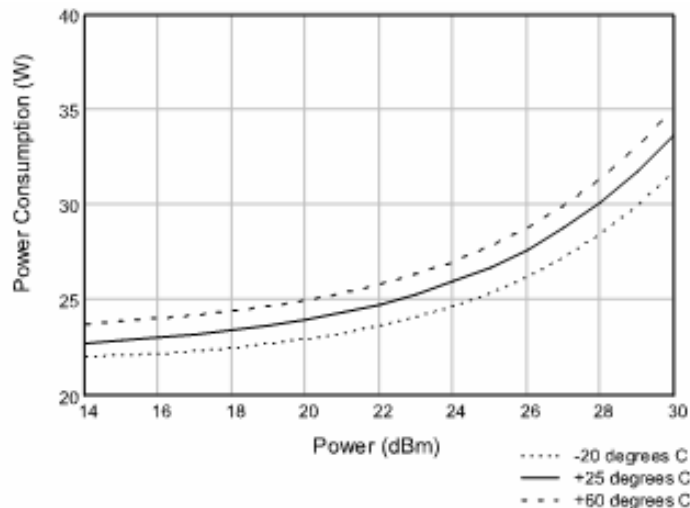


Figure 6 Typical Power Consumption versus Conducted Output Power at 910 MHz
Identity5100 User's Guide

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	100%, condensing
International Protection Rating	IP65

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

Power Supply Specifications

Model	Lambda DSP100-24
Input Voltage	90 – 264 Vac,
Input Frequency	47 to 63 Hz
Power	100.8W
Holdup Time	10 ms (115 Vac)
Output Voltage	24 VDC
Output Current	4.2A

RS-232 Specifications

Connector	DB-9S
Baud rate	9600 - 115200 (Default = 115200)
Parity	None
Data bits	8
Stop bits	1
Signals	Pin 1 - NC Pin 2 - TXD Pin 3 - RXD Pin 4 - Connected to Pin 6 Pin 5 - GND Pin 6 - Connected to Pin 4 Pin 7 - CTS Pin 8 - RTSA Pin 9 - NC

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 - NC Pin 5 - NC Pin 6 - RXD- (Receive Data -) Pin 7 - NC Pin 8 - NC

Antenna Cable Specifications

Manufacturer	Time Microwave Systems
Part No.	LMR-400 (replacement for RG-8/9913)
Connector Type	RP-TNC
Impedance	50 ohms
Attenuation	3.9 dB/100 ft (12.8 dB/100m)

Internal Antenna Specifications

Type	PATCH
Frequency (FCC)	902 – 928 MHz
Polarization	Linear (Horizontal)
Gain	13 (minimum)
VSWR, maximum	1.7:1 or less
Input impedance	50 ohm (nominal)
Power Handling	6 W
Size	17.1 in x 17.7 in x 1.4 in (450 mm x 450 mm x 36 mm)
Weight	16.6 oz (470 g)

External Antenna Specifications

Manufacturer	MTI Wireless	MTI Wireless
Part No.	MT-263006/N	MT-263006/N
Type	PATCH	PATCH
Frequency (FCC)	902 – 928 MHz	902 – 928 MHz
Polarization	Linear (Horizontal)	Linear (Horizontal)
Gain	12.5 dBi (minimum)	10 dBi (minimum)
VSWR, maximum	1.7:1 or less	1.5:1 or less
Input impedance	50 ohm (nominal)	50 ohm (nominal)
Input Power	6 W	6 W
Size	17.1 in x 17.7 in x 1.4 in (450 mm x 450 mm x 36 mm)	12 in x 12 in x 1 in (305 mm x 305 mm x 25 mm)

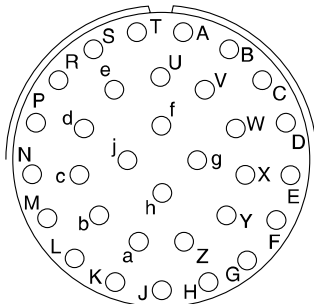


Caution: *This device is designed to operate with a 13 dBi gain internal antenna and conducted power is factory set to 23 dBm (200 mW). When conducted power is set to 1W, the antenna gain cannot exceed 6 dBi. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada when utilizing maximum power. Power into the antenna must decreased to compensate for any 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.

Bulkhead Connector/Interface Cable Pinout



Pair	Pin	Color	Pin Name	Function
1	A	Black	Tx+	Ethernet
	B	Green	Tx-	Ethernet
2	C	Black	Rx+	Ethernet
	D	Orange	Rx-	Ethernet
3	E	Blue	VC2+	Ethernet
	F	Black	VC2-	Ethernet
4	G	Black	VC2+	Ethernet
	H	Brown	VC2-	Ethernet
5	J	Black	RS-232 TXD	Serial Port
	K	Red	RS-232 RXD	Serial Port
6	L	Black		
	M	White	RS-232 GND	Serial Port
7	N	Black		
	P	Yellow	RS-232 CTS	Serial Port
8	R	Red	RS-232 RTS	Serial Port
	S	White	No Connect	
9	T	Red	+24 Vdc	Power
	U	Green	24 Vdc GND	Ground
10	V	Red	DIN Ref 1	Digital Input Common
	W	Blue	DIN1	Digital Input 1
11	X	Red	DIN2	Digital Input 2
	Y	Yellow	DIN Ref 2	Digital Input Common
12	Z	Red	DIN3	Digital Input 3
	a	Brown	DIN4	Digital Input 4
13	b	Red	GND	Ground (Reader)
	c	Orange	DOUT1	Digital Output 1
14	d	Green	DOUT2	Digital Output 2
	e	White	DOUT3	Digital Output 3
15	f	Green	DOUT4	Digital Output 4
	g	Blue	GND	Ground (Reader)
16	h	n/a	n/a	n/a
	j	n/a	n/a	n/a

Safety Instructions

Power Disconnect Device

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

RF Safety



WARNING: *FCC Radiation Exposure Statement. The antennas used for this transmitter must be installed to provide a separation distance of at least 1 meter from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.*



Caution: *The IDentity 5100 UHF Reader is equipped with two (2) RF ports and is factory configured to operate on the internal RF port (1). To prevent reader damage, the external RF Port (2) must be properly terminated with a 50 ohm load or a functional UHF antenna before power up if the reader has been configured to use this port. 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.*

Electrostatic Discharge



ATTENTION *IDentity 5100 antenna ports may be susceptible to damage from static discharge or other high voltage. Use proper Electrostatic Discharge (ESD) precautions to avoid static discharge when handling or making connections to the IDentity 5100 reader antenna or communication ports. Equipment failure can result if the antenna or communication ports are subjected to ESD.*

Regulatory Compliance



Caution: *The IDentity 5100 is designed to meet the regulatory requirements in those jurisdictions in which it is offered. Changes or modifications not expressly approved by Sirit Technologies for compliance could void the user's authority to operate the equipment.*



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