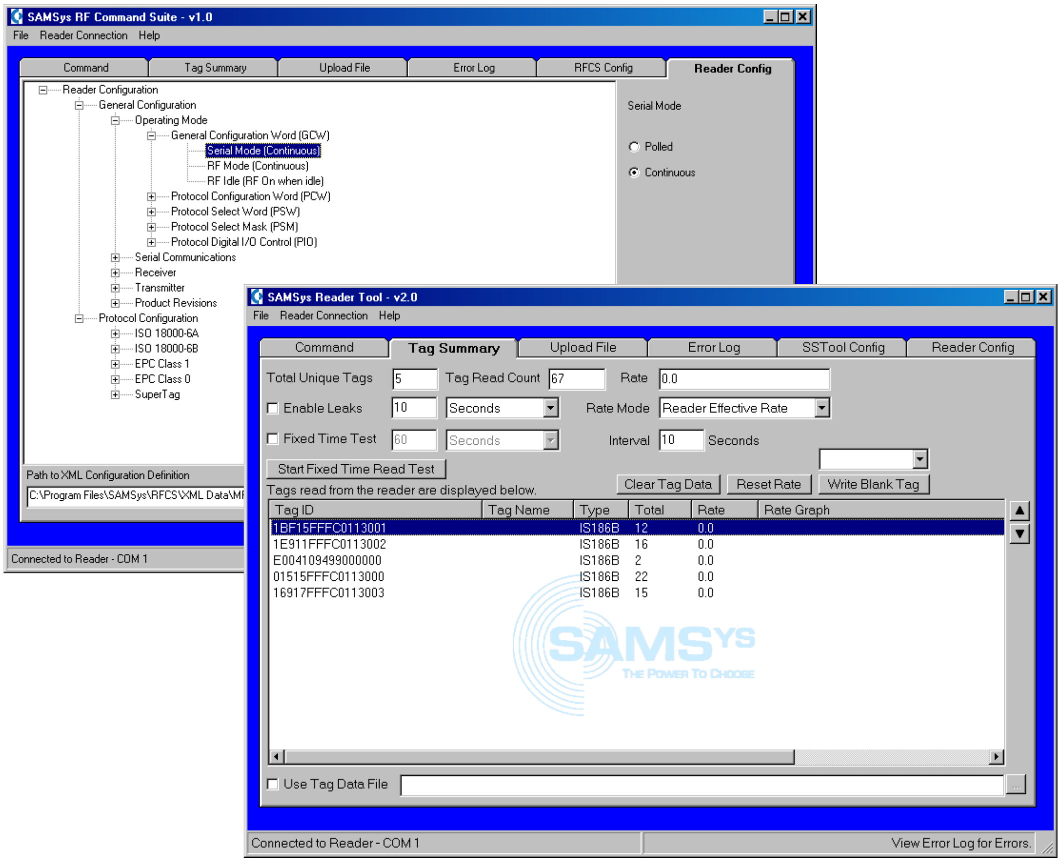
User's Guide

RF Command Suite 1.0

Reader Management for SAMSys Readers



- Reader Configuration
  - General Configuration
    - Operating Mode
      - General Configuration Word (GCW)
        - Serial Mode (Continuous)
        - RF Mode (Continuous)
        - RF Idle (RF On when idle)
      - Protocol Configuration Word (PCW)
      - Protocol Select Word (PSW)
      - Protocol Select Mask (PSM)
      - Protocol Digital I/O Control (PIO)
    - Serial Communications
    - Receiver
    - Transmitter
    - Product Revisions
  - Protocol Configuration
    - ISO 18000-6A
    - ISO 18000-6B
    - EPC Class 1
    - EPC Class 0
    - SuperTag

Serial Mode

○ Polled

● Continuous

Path to XML Configuration Definition

C:\Program Files\SAMSys\RFCS\XML Data\MI

Connected to Reader - COM 1

Total Unique Tags 5 Tag Read Count 67 Rate 0.0

☐ Enable Leaks 10 Seconds Rate Mode Reader Effective Rate

☐ Fixed Time Test 60 Seconds Interval 10 Seconds

Tags read from the reader are displayed below.

Tag ID	Tag Name	Type	Total	Rate	Rate Graph
1BF15FFFC0113001		IS186B	12	0.0	
1E911FFFC0113002		IS186B	16	0.0	
E004109499000000		IS186B	2	0.0	
01515FFFC0113000		IS186B	22	0.0	
16917FFFC0113003		IS186B	15	0.0	

☐ Use Tag Data File

Connected to Reader - COM 1

View Error Log for Errors.

SAMSYS
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SAMSys

RF Command Suite 1.0 User's Guide

First Edition (December 2004)

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About SAMSys

SAMSys Technologies, Inc. is a world-leading provider of RFID reader hardware solutions in the LF, HF, and UHF segments of the RFID marketplace. SAMSys is a public company listed on the Toroto Stock Exchange under the symbol SMY.

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Manual Part Number: HI471-RFCS-V1.0

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Chapter 1

Introduction

This chapter provides a general overview for the SAMSys RF Command Suite application. Topics discussed in this chapter include the following:

- Purpose of this document
- Assumptions
- Overview
- Installing RF Command Suite
- RF Command Suite Startup
- RS-232 Serial Communication Setup
- Ethernet Communication Setup
- RF Command Suite Version Identification

Purpose of this Document

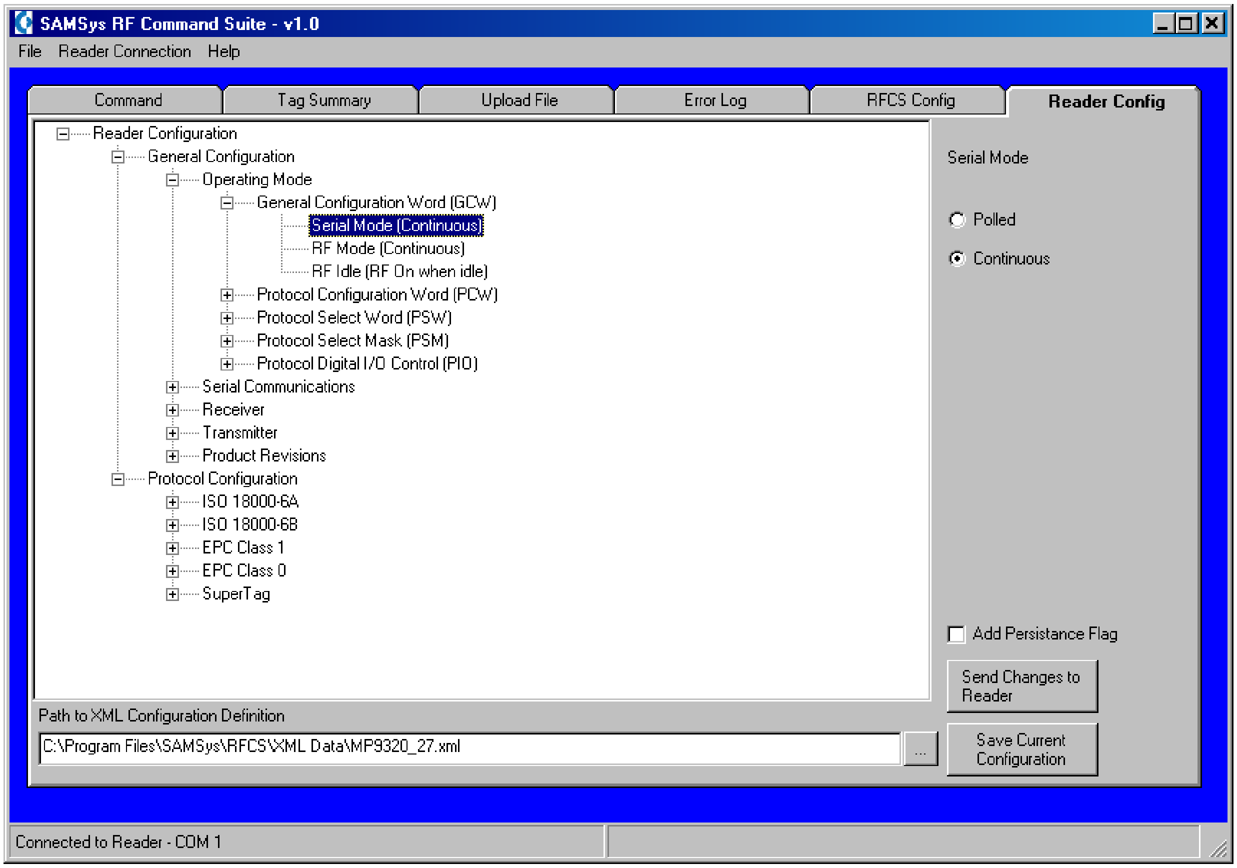
This document provides RF Command Suite users and technicians with instructions for installing and operating the RF Command Suite. The RF Command Suite and associated documentation are provided as an aid for configuring your SAMSys RFID system and is not intended as an engineering design system. This tool is provided with no implied warranties.

Assumptions

This document is intended for technical personnel who are trained and experienced with the setup and configuration of basic application software packages, serial ports, and general SAMSys reader operation.

Overview

The SAMSys RF Command Suite is a Microsoft Windows application that provides a Graphical User Interface (GUI) for SAMSys RFID Reader Products.



Serial Mode

○ Polled

● Continuous

☐ Add Persistance Flag

Path to XML Configuration Definition

C:\Program Files\SAMSys\RFCS\XML Data\MP9320_27.xml

Connected to Reader - COM 1

Figure 1– *RF Command Suite Reader Configuration Screen*

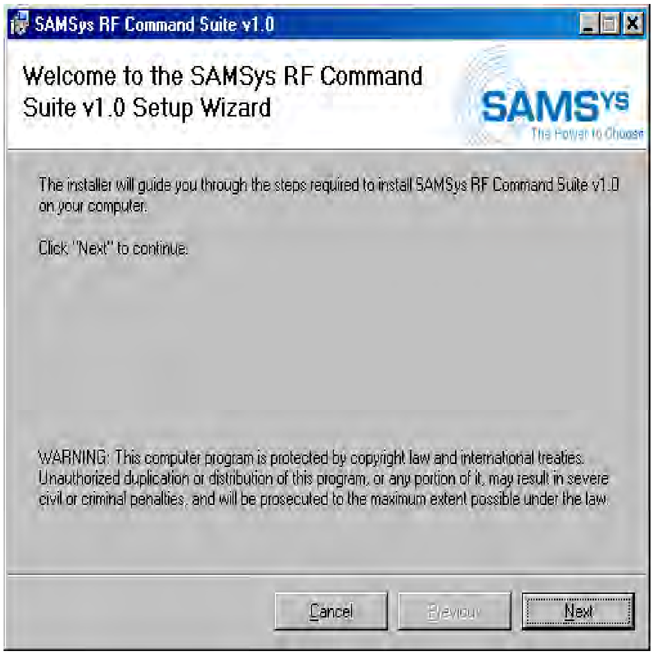
Functions provided by the RF Command Suite include the following:

- View tag data
- Parse tag data
- Reset the reader
- Configure the reader
- Select tag protocols
- Submit control commands to the reader

Installing RF Command Suite

RF Command Suite is delivered on your Customer Documentation CD and consists of one (1) Windows Installer file named **`Setup_RFCommandSuite_10`**. To install the tool, perform the following:

1. Copy the **`Setup_RFCommandSuite_10`** file to your Windows desktop.
2. Double-click the **`Setup_RFCommandSuite_10`** icon. The Installer window is displayed.



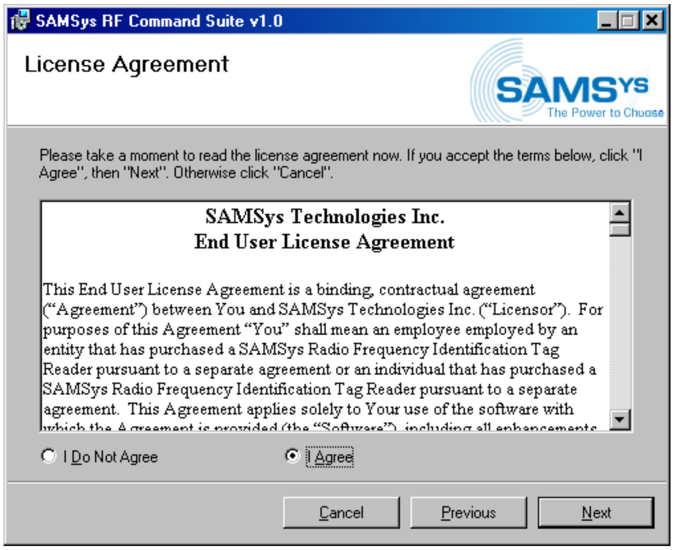
Welcome to the SAMSys RF Command Suite v1.0 Setup Wizard

The installer will guide you through the steps required to install SAMSys RF Command Suite v1.0 on your computer.

Click "Next" to continue.

WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.

3. Press **Next**. The License Agreement window is displayed.



License Agreement

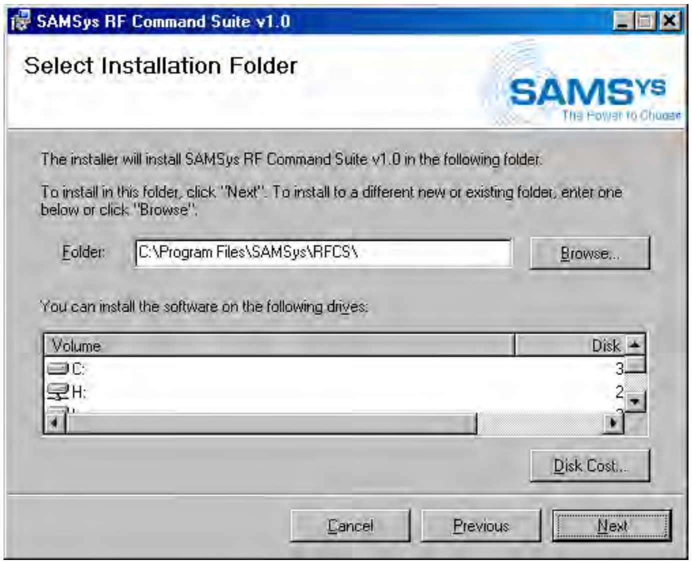
Please take a moment to read the license agreement now. If you accept the terms below, click "I Agree", then "Next". Otherwise click "Cancel".

SAMSys Technologies Inc.
End User License Agreement

This End User License Agreement is a binding, contractual agreement ("Agreement") between You and SAMSys Technologies Inc. ("Licensor"). For purposes of this Agreement "You" shall mean an employee employed by an entity that has purchased a SAMSys Radio Frequency Identification Tag Reader pursuant to a separate agreement or an individual that has purchased a SAMSys Radio Frequency Identification Tag Reader pursuant to a separate agreement. This Agreement applies solely to Your use of the software with which the Agreement is provided (the "Software"), including all enhancements

○ I Do Not Agree ● I Agree

4. Read the license agreement and if you agree with the conditions of the license, select **I Agree** and press **Next**. The target directory window is displayed.


SAMSys RF Command Suite v1.0

Select Installation Folder

The installer will install SAMSys RF Command Suite v1.0 in the following folder.

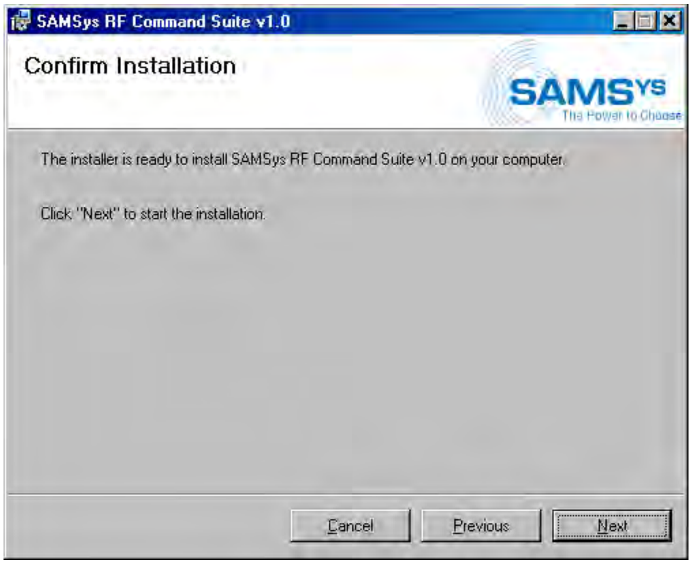
To install in this folder, click "Next". To install to a different new or existing folder, enter one below or click "Browse".

Folder: C:\Program Files\SAMSys\RFCS\

You can install the software on the following drives:

Volume	Disk
C:	3
H:	2

5. Verify the target directory is correct. If you are unsure if your system has sufficient disk space press **Disk Cost**. The available drives and memory is displayed. If the disk space is sufficient, press the **OK** and then press **Next**.

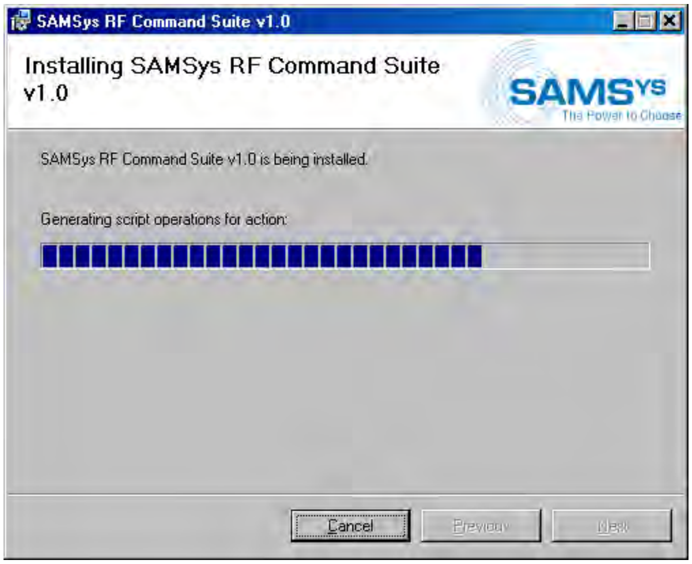

SAMSys RF Command Suite v1.0

Confirm Installation

The installer is ready to install SAMSys RF Command Suite v1.0 on your computer.

Click "Next" to start the installation.

6. To begin the actual application installation press **Next**.



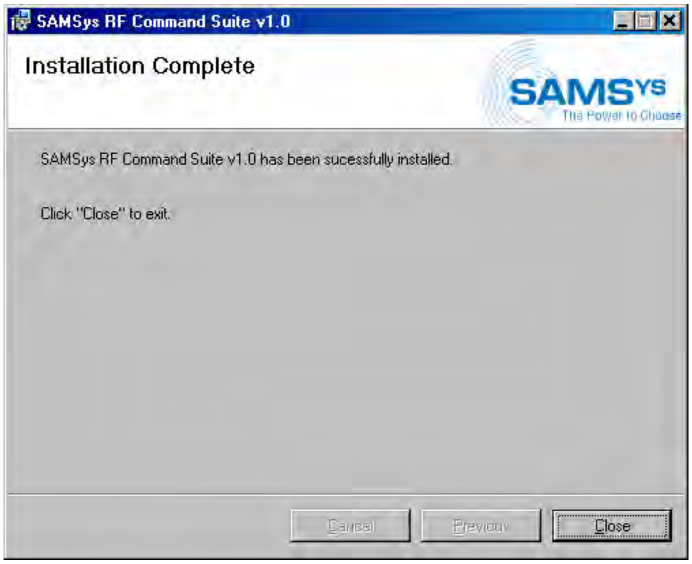
SAMSys RF Command Suite v1.0

Installing SAMSys RF Command Suite v1.0

SAMSys RF Command Suite v1.0 is being installed.

Generating script operations for action:

7. The Windows Installer will install the RF Command Suite files.



SAMSys RF Command Suite v1.0

Installation Complete

SAMSys RF Command Suite v1.0 has been sucessfully installed.

Click "Close" to exit.

8. When complete, press **Close**.

RF Command Suite Startup

RF Command Suite can communicate with all SAMSys readers through the Ethernet (TCP/IP) port or RS-232 serial port. Verify your reader is connected to the correct port and powered up.

To start up RF Command Suite, perform the following:

1. Select **Start ⇨ Programs ⇨ SAMSys ⇨ Samsys RF Command Suite 1.0**.
2. The application will attempt to connect to using the most recent configuration settings.
3. If RF Command Suite does not connect to the reader, try connecting using an automated search for the correct setting. Select:

   Reader Connection ⇨ Auto Connect

4. If the reader still does not connect, verify the communication connection by selecting one of the following from the pull-down menus on the top of the interface:
   a. For serial port connections, select:

      Reader Connection ⇨ Serial Port Settings (to verify the parameters)

      Reader Connection ⇨ Connect via Serial Port

      Reader Connection ⇨ Reconnect

   b. For TCP/IP connections, select:

      Reader Connection ⇨ TCP/IP Settings (to verify the parameters)

      Reader Connection ⇨ Connect via TCP/IP

      Reader Connection ⇨ Reconnect

NOTE: *The default RS-232 settings for most SAMSys readers are COM1, 9600 Baud, 8 data bits, 1 stop bit, and no parity.*

5. If you are unable to establish a reader connection with the reader after verifying the port parameters, try setting the reader back to its default configuration. Select:

   Reader Connection ⇨ Serial Port Recovery

6. Reverify the port settings and reconnect as necessary.

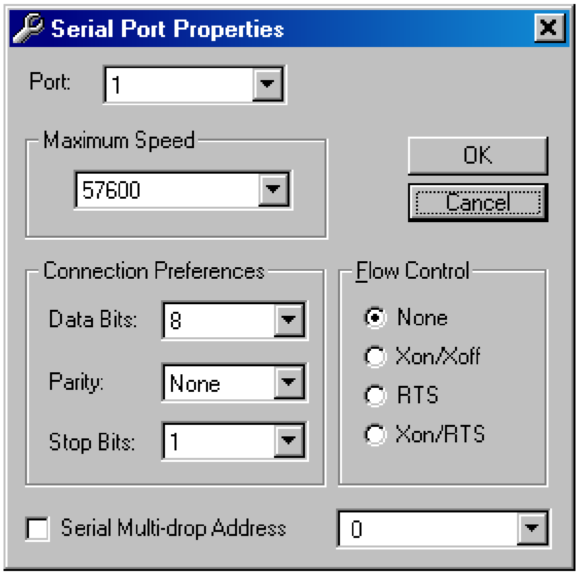
RS-232 Serial Communication Setup

RF Command Suite Serial Port Setup

The serial port on your PC can be configured using RF Command Suite. To set your serial port parameters, perform the following:

1. From the tool bar pull-down menu, select **Reader Connection ⇨ Serial Port Settings.**

2. The Serial Port Properties window is displayed.



Serial Port Properties

Port: 1

Maximum Speed
57600

Connection Preferences
Data Bits: 8
Parity: None
Stop Bits: 1

Flow Control
● None
○ Xon/Xoff
○ RTS
○ Xon/RTS

☐ Serial Multi-drop Address 0

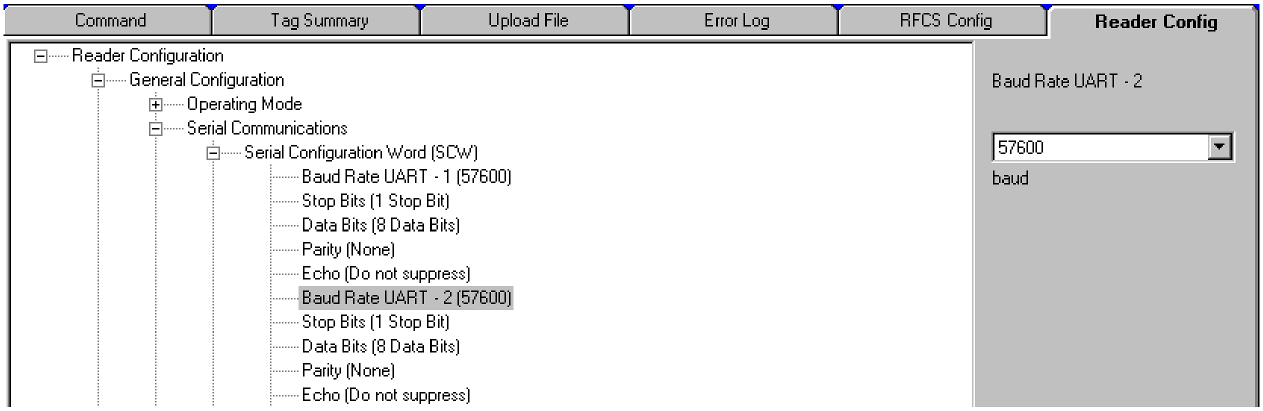
Figure 2–*PC Serial Port Properties*

Modifying the Reader Serial Port

To verify the reader's serial port is set properly perform the following:

1. Select the **Reader Config** tab.

2. Expand **Reader Configuration ⇨ General Configuration ⇨ Serial Communications ⇨ Serial Configuration Word (SCW).**



- Reader Configuration
  - General Configuration
    - Operating Mode
    - Serial Communications
      - Serial Configuration Word (SCW)
        - Baud Rate UART - 1 (57600)
        - Stop Bits (1 Stop Bit)
        - Data Bits (8 Data Bits)
        - Parity (None)
        - Echo (Do not suppress)
        - Baud Rate UART - 2 (57600)
        - Stop Bits (1 Stop Bit)
        - Data Bits (8 Data Bits)
        - Parity (None)
        - Echo (Do not suppress)

Baud Rate UART - 2

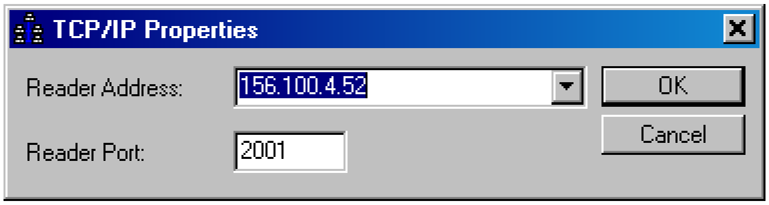
57600 baud

Figure 3–*Reader Serial Port Properties*

3. Determine which UART is driving the serial port:
   - UART-1 – unused
   - UART-2 – RS-232
   - UART-3 – RS-485/Ethernet (jumper selectable on the reader)
4. Change any settings and click **Send Changes to Reader** .

Ethernet Communication Setup

1. If the tool fails to establish a connection over the Ethernet port, select **Reader Connection ⇨ TCP/IP Settings** from the pull-down menu.



Reader Address: 156.100.4.52

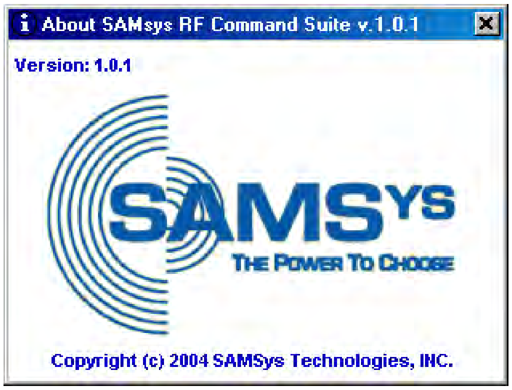
Reader Port: 2001

Figure 4–*Ethernet Port Properties*

2. If necessary, change the **Reader Address** and **Reader Port** and click **OK**.
3. After verifying the appropriate port parameters, close the properties box and select **Reader Connection ⇨ Reconnect**.

RF Command Suite Version Identification

To determine the current version of your RF Command Suite application, select **Help ⇨ About** from the pull-down menu.



Version: 1.0.1

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Figure 5*–RF Command Suite Version Information Window*

Chapter 2

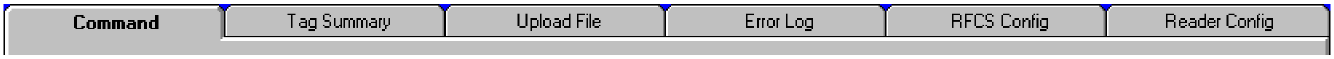
User Interfaces

This chapter provides a description of the user interface windows provided by RF Command Suite. Topics discussed in this chapter include the following:

- Function Tabs and Pull-Down Menus
- Command Interface
- Tag Summary Interface
- Upload File Interface
- Error Log Interface
- RFCS Configuration Interface
- Reader Configuration Interface

Function Tabs and Pull-Down Menus

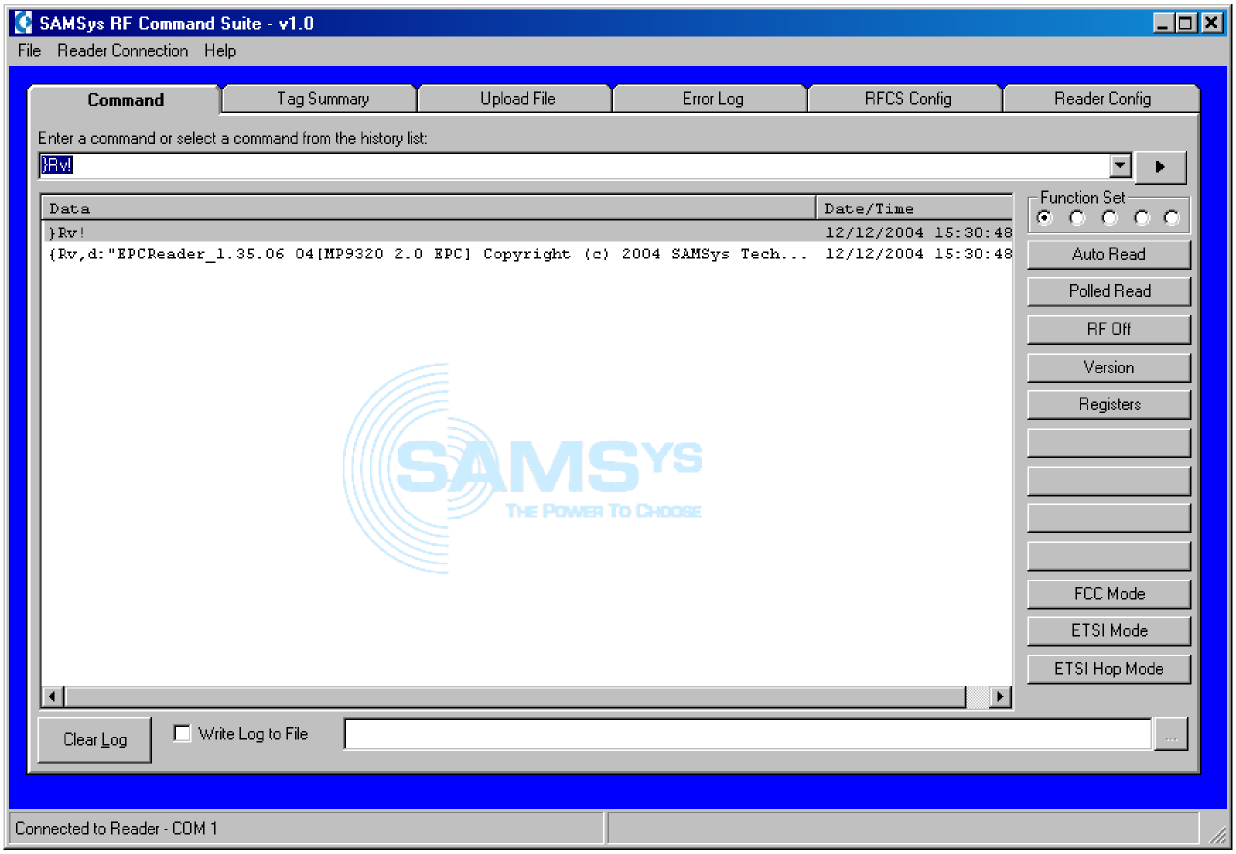
The RF Command Suite user interface is displayed when the tool is launched from the desktop or Start menu. To simplify use, RF Command Suite operations are divided into six functional interfaces selected by tabs at the top of the display. A set of pull-down menus is also provided for basic file and reader operations.



Function	Description
Command	Selects Command Interface to send CHUMP commands, execute macros, and view data logs.
Tag Summary	Selects Tag Summary Interface to display tag read parameters including tag read totals, read rates, and time intervals.
Upload File	Selects Upload File Interface to upload firmware or image files to the reader.
Error Log	Selects on-screen Error Log Interface to display all errors received from the reader.
RFCS Config	Selects the RF Command Suite Configuration Interface to set display characteristics and parameters.
Reader Config	Selects Reader Configuration Interface to set communication parameters and other reader options.
`File ⇨ Macros`	
⇨ **`Load Macro File`**	Loads a specific macro file to define function keys.
⇨ **`Create Macro File`**	Creates new macro file for defining function keys.
⇨ **`Save Macro File`**	Saves a new or modified macro file.
⇨ **`Save Macro As`**	Saves the macro file under a new name.
`Reader Connection`	
⇨ **`Reset Reader`**	Sends serial reset to reader.
⇨ **`Reconnect`**	Attempts to reconnect reader using current settings.
⇨ **`Auto-Connect`**	Attempts to connect reader using all available baud rates.
⇨ **`Disconnect`**	Disconnects reader from the system.
⇨ **`Connect via Serial Port`**	Configures reader to communicate with serial port.
⇨ **`Connect via TCP/IP`**	Configures reader to communicate with Ethernet port.
⇨ **`Serial Port Settings`**	Sets serial port parameters.
⇨ **`TCP/IP Settings`**	Sets the TCP/IP connection parameters.

Command Interface

After startup, the **Command** interface is displayed. As shown in Figure 6, this interface provides a command line for sending CHUMP commands to a reader and a log window to view all data received from the reader. In addition, 5 sets of 12 function keys are provided for executing predefined macros.



Enter a command or select a command from the history list:

}Rv!

```
Data                                                                Date/Time
}Rv!                                                                12/12/2004 15:30:48
{Rv,d:"EPCReader_1.35.06 04[MP9320 2.0 EPC] Copyright (c) 2004 SAMSys Tech...  12/12/2004 15:30:48
```

☐ Write Log to File

Connected to Reader - COM 1

Figure 6 – *Command Interface*

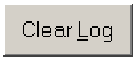
Command Line

This field provides a location for entering and sending CHUMP commands to a reader. Enter the command in the space provided and press the Send button ▶ or the **Enter** key on the keyboard. The last 20 commands are retained in a history list and can be recalled by pressing the History button ▼.

Log Window

The log window provides a display for reader data. Up to 5000 of the last communications from the reader are stored in the log and can be displayed by sliding the elevator up and down. Each row contains the reader data and a time/ date stamp for each communication.

Clear Log



The button clears all data from the on-screen log.

Write Log to File

The **Write Log to File** selector is used to store the data from the on-screen log to a file. Press the Browse/Save button ... to open the **Save Log File as...** dialog box.

Function Key Sets

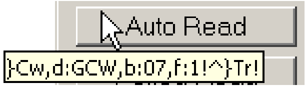
Five sets of programmable function keys are provided. There are 12 function keys per set. Click a radio button above the function keys to load another set.

When pressed, the function keys transmit a predefined CHUMP command to the reader. In most cases, the function keys are defined by macro files provided with RF Command Suite. These macro files program the function keys based on a specific reader type and include configuration and protocol selection functions.

In the event that a single function key needs programming, individual keys can be programmed with a CHUMP command and assigned a unique key name. The keys are programmed by right-clicking the key and selecting the **Edit Macro** function.

Quickly Viewing the Function Key Commands

To quickly view the CHUMP command associated with a function key, place the mouse pointer over the key for three seconds. The CHUMP command is displayed as follows:



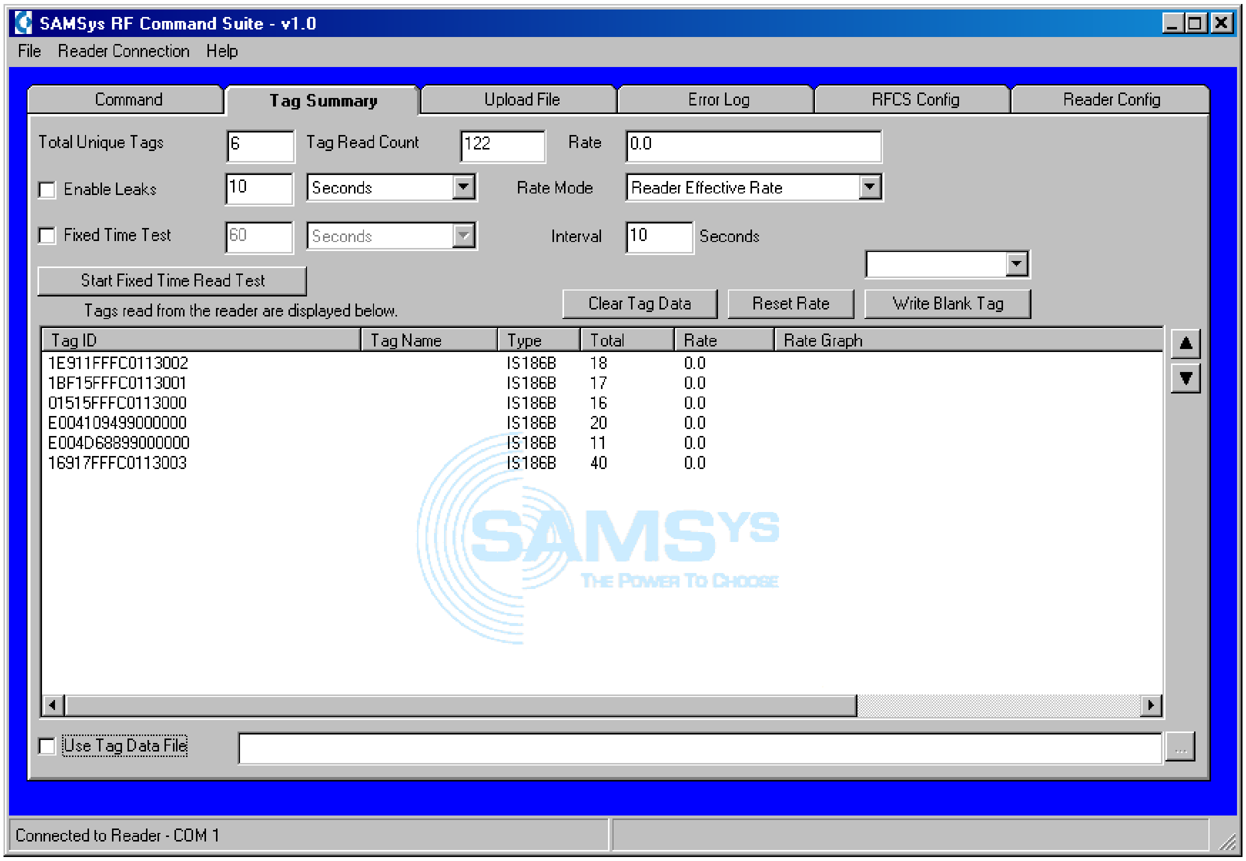
```
}Cw,d:GCW,b:07,f:1!^}Tr!
```

Figure 7 – *CHUMP Command Associated with Function Key*

Tag Summary Interface

The Tag Summary Interface displays information about tags being read by the reader. This information includes the Tag ID, Tag Name, Type, Total Tags Read, and the Date/Time. Read rates, rate mode, and tag counts are also provided.

In addition, individual tags shown in the display window can be read and written. Right click the tag line in the display window and enter the tag specific data. For more information on this function, refer to the Modify Tags section in Chapter 3 - Operation.



Total Unique Tags: 6
Tag Read Count: 122
Rate: 0.0

☐ Enable Leaks: 10 Seconds
Rate Mode: Reader Effective Rate

☐ Fixed Time Test: 60 Seconds
Interval: 10 Seconds

Tags read from the reader are displayed below.

Tag ID	Tag Name	Type	Total	Rate	Rate Graph
1E911FFFC0113002		IS186B	18	0.0	
1BF15FFFC0113001		IS186B	17	0.0	
01515FFFC0113000		IS186B	16	0.0	
E004109499000000		IS186B	20	0.0	
E004D68899000000		IS186B	11	0.0	
16917FFFC0113003		IS186B	40	0.0	

☐ Use Tag Data File

Connected to Reader - COM 1

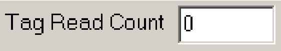
Figure 8 – Tag Summary Interface

Total Unique Tags

Total Unique Tags: 0

This field displays the number of unique tags that have been read during the session. Multiple reads on the same tag are ignored. To clear this counter, press the **Clear Tags** button.

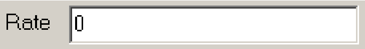
Tag Read Count



Tag Read Count 0

This field displays the total tag reads since the last reset or program restart. This value does not include tags that have leaked from the display (see Enable Leaks).

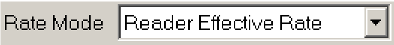
Rate



Rate 0

This field displays the tag read rate, in tags per second, as determined by the **Rate Mode** selector.

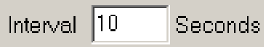
Rate Mode



Rate Mode Reader Effective Rate

This pull-down menu selects the calculation mode. The **Reader Effective Rate** mode is the number of tag reads per second for a given period. **Anti-Collision Rate** is the number of tags per second minus the communication delay and reflects the approximate read rate on the RF interface.

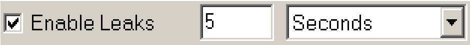
Interval



Interval 10 Seconds

Entering a value in this field sets the time window for calculating the tag read rate. For example: If the interval = 10, then the Rate = the total number of tags read in 10 seconds divided by 10.

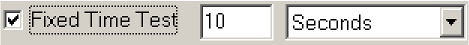
Enable Leaks



☑ Enable Leaks 5 Seconds

This option instructs the system to remove tags from the display after a set period of inactivity. When a tag has been inactive for the period, it is removed from the display and the **Total Unique Tags**, **Tag Read Count**, and **Rate** fields are updated to reflect the removal.

Fixed Time Test



☑ Fixed Time Test 10 Seconds

This option sets RF Command Suite to read tags for a specific time period. When selected, the display is cleared and the **Total Unique Tags**, **Tag Read Count**, and **Rate** fields are reset. Tags are not read until the **Start Fixed Time Read Test** button is pressed.

Start Fixed Time Read Test

This button starts the Fixed Time Read Test. When pressed, tags are read for the duration shown in the Fixed Time Test field. The button changes to **Cancel Fixed Time Read Test** and a countdown timer is displayed (format is hh:mm:ss)

.

Reset Rate

This button resets the **Tag Read Count**, and **Rate** fields to zero. The **Total** and **Rate** columns in the tag display window are also reset.

Write Blank Tags

After selecting the protocol from the pull-down menu, pressing this button calls up a dialog box for entering data to write to a blank tag.

Clear Tags

This button clears all tag list data from the tag display window. The **Total Unique Tags, Tag Read Count**, and **Rate** fields are reset to zero.

Tag Display

The main tag display window shows all tags currently tracked by RF Command Suite. The tag data includes the following:

- **Tag ID** - Tag serial number
- **Tag Name** - Name assigned in an associated data file.
- **Type** - Tag type such as EPC1, IS186B, or EPC0.
- **Total** - Number of times the tag has been read.
- **Rate** - Read rate (tag reads/second).
- **Rate Graph** - Graphical representation of the tag read rate.
- **Date/Time** - Last data and time the tag was read

NOTE: *Press the column label button above each column to sort displayed tags in either ascending or descending order.*

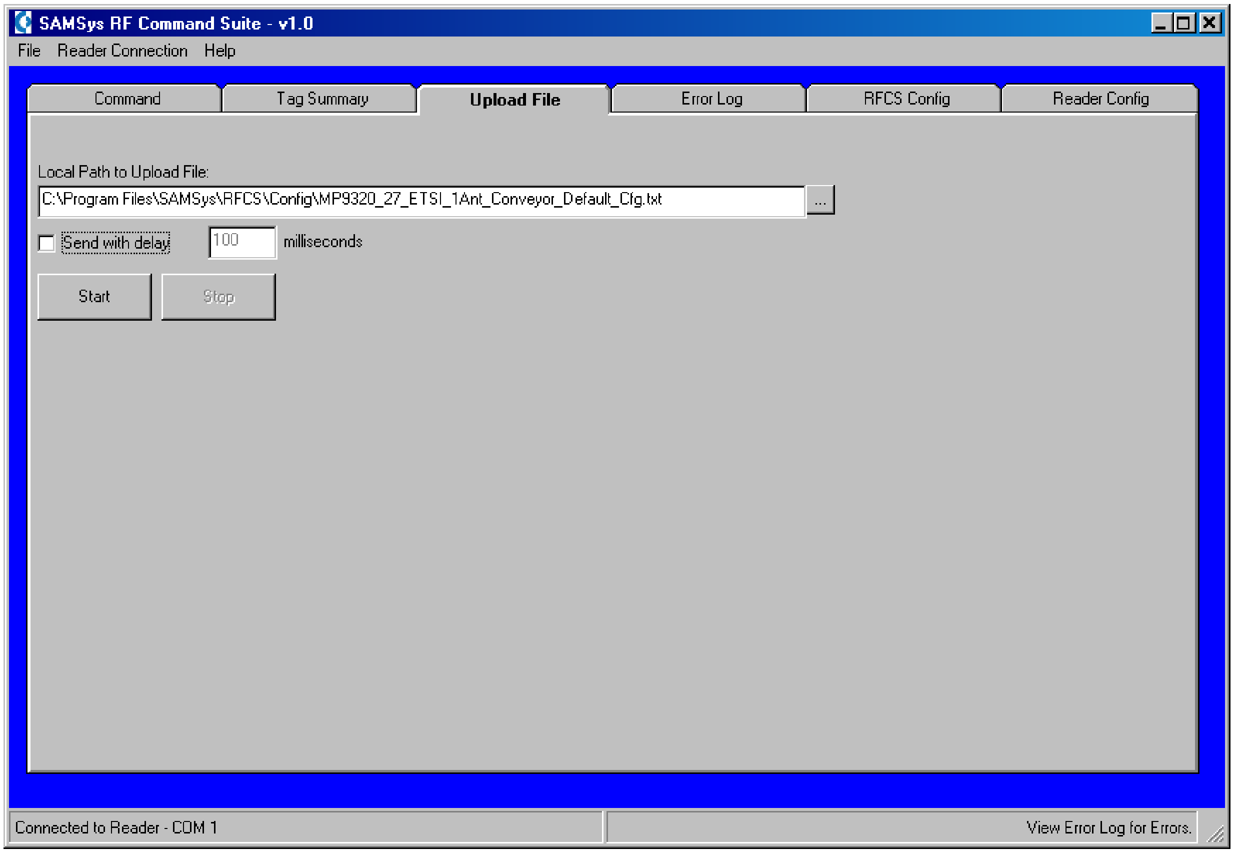
Use Tag Data File

This option indicates that a tag data file containing human readable tag names is available and should be accessed by RF Command Suite. The tag name is shown in the **Tag Name** column of the Tag Display.

Upload File Interface

The Upload File Interface is used to upload a file to the reader. Reader files include new protocols, enhanced features, default configurations, and updated FlashROM images. SAMSys readers can be automatically updated with new firmware using this interface.

When uploading a file, RF Command Suite sends one line at a time and waits for the **`{a`** response from the reader before sending the next line. If an **`e:`** is received, indicating an error, the upload aborts.



Local Path to Upload File: C:\Program Files\SAMSys\RFCS\Config\MP9320_27_ETSI_1Ant_Conveyor_Default_Cfg.txt

☐ Send with delay 100 milliseconds

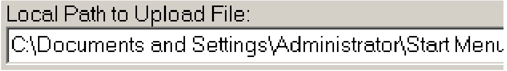
Connected to Reader - COM 1

View Error Log for Errors.

Figure 9 – *Upload File Interface*

NOTE: *The RF Command Suite installation includes default reader configuration files that can be used as a template to speed up reader configuration. The configuration files are located at* ***`Program Files\SAMSys\RFCS\Config\`****.*

Local Path to Upload File

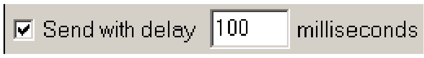


Local Path to Upload File:

C:\Documents and Settings\Administrator\Start Menu

The location of the file to upload is entered in this field. To use the directory navigator, press the Browse button ... .

Send with delay



☑ Send with delay 100 milliseconds

This option is used when uploading FORTH code to the reader. When enabled, this option inserts a time delay (in milliseconds) between each line of the file to upload. Each line is sent after the delay instead of waiting for a system response between lines. If an `e:` is received, indicating an error, the transfer aborts.

Start

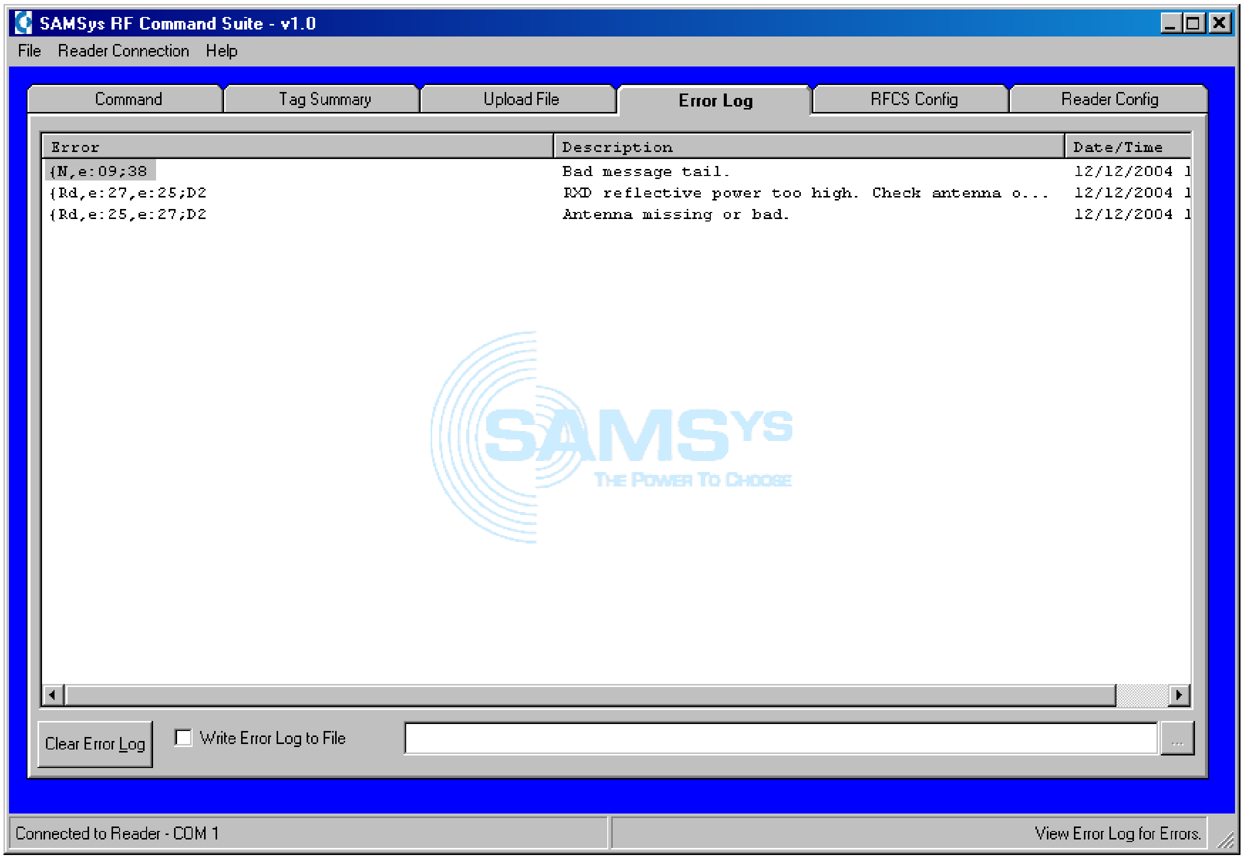
This button starts the file upload. A **Transferring File - xx%** message is displayed along with a progress indicator bar. The **Stop** button is enabled when this button is clicked.

Stop

This button stops the current upload. The progress indicator bar is disabled and the **Transferring File** message is removed.

Error Log Interface

The Error Log Interface displays errors received from the reader. the log contains up to 5000 errors or any reader communication beginning with **e:**. The error code, description, and date/time are provided. If an Errors.ini file is provided, a description of the error will also be displayed. When an error is present, the **View Error Log for Errors** message is displayed in the lower right corner of the window.



Error	Description	Date/Time
{N,e:09;38	Bad message tail.	12/12/2004 1
{Rd,e:27,e:25;D2	RXD reflective power too high. Check antenna o...	12/12/2004 1
{Rd,e:25,e:27;D2	Antenna missing or bad.	12/12/2004 1

☐ Write Error Log to File

Connected to Reader - COM 1

View Error Log for Errors.

Figure 10 – Error Log Interface

Write Error Log to File

☑ Write Error Log to File C:\Program Files\SAMSys\SSTool\error.log

This option writes all errors in the log to a text file. Press the Browse button ... to select the path and file.

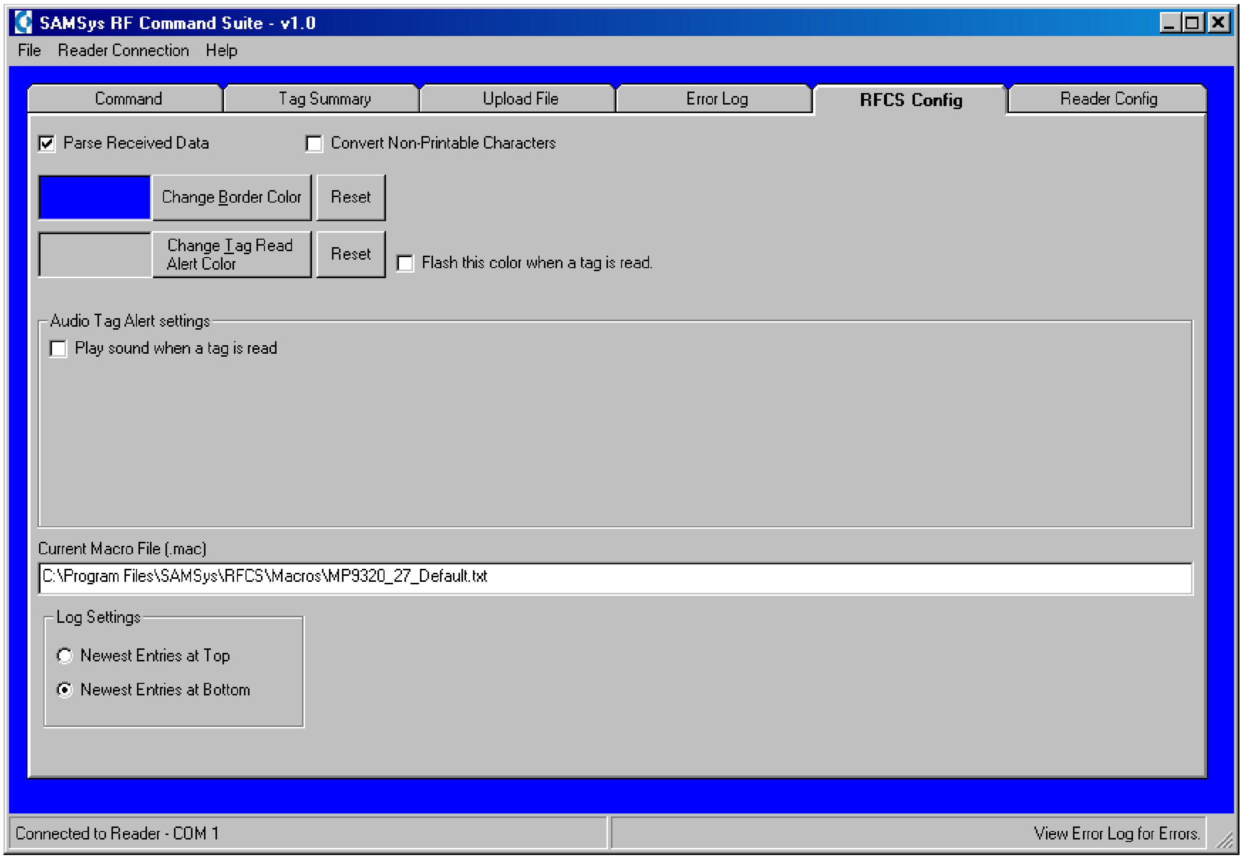
Clear Error Log

Clear Error Log

This button clears all errors from the display and error log.

RFCS Configuration Interface

The RFCS Configuration Interface provides options for setting RF Command Suite interface border colors and visible/audible tag read alerts. This interface is also used to configure the application to parse incoming data for tag reads.



☑ Parse Received Data
☐ Convert Non-Printable Characters
☐ Flash this color when a tag is read.
☐ Play sound when a tag is read

Current Macro File (.mac)
C:\Program Files\SAMSys\RFCS\Macros\MP9320_27_Default.txt

○ Newest Entries at Top
● Newest Entries at Bottom

Connected to Reader - COM 1
View Error Log for Errors.

***Figure 11** – RF Command Suite Configuration Interface*

Parse Received Data ☑ Parse Received Data

This option configures RF Command Suite to parse incoming data for tag reads. Data is parsed when it is received from the reader and tag data is displayed in the Tag Summary interface.

Change Border Color Change Border Color

Pressing this button displays a color palette for setting the RF Command Suite interface border color. The setting is stored in the application INI file. Pressing the Reset button Reset sets the border color back to the default.

Change Tag Read Alert Color

Pressing this button displays a color palette for setting the RF Command Suite interface border color. The setting is stored in the application INI file. Pressing the Reset button Reset sets the tag alert color back to the default.

Audio Tag Alert settings

☑ Play sound when a tag is read

This option activates the audible tag read alert.

○ System Beep

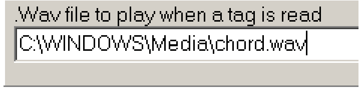
Selecting this option activates the system beep on tag read.

● Play .Wav File

Selecting this option plays a **.wav** file on tag read.

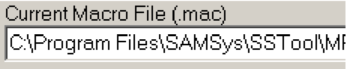
Pressing this button momentarily activates the selected sound.

Wav file to play when a tag is read


.Wav file to play when a tag is read
C:\WINDOWS\Media\chord.wav

The path and name of the **.wav** file to play is entered in this field. To use the directory navigator, press the Browse button ... .

Current Macro File (.mac)


Current Macro File (.mac)
C:\Program Files\SAMSys\SSTool\MF

The path and name of the currently loaded macro file is shown in this field. This field is for reference only.

Log Settings

● Newest Entries at Top

This option displays the newest log entries at the top of the log file.

● Newest Entries at Bottom

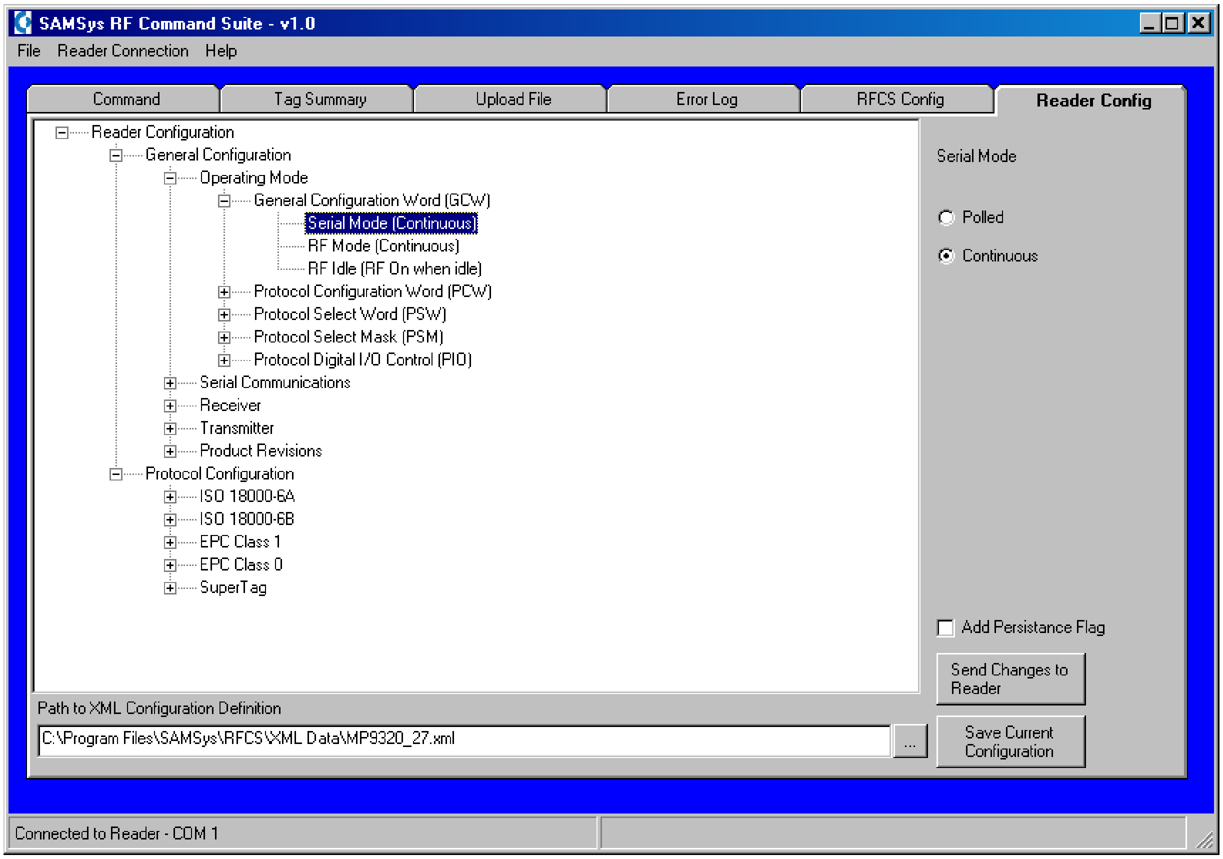
This option displays the newest log entries at the bottom of the log file.

Reader Configuration Interface

The Reader Configuration Interface is used to configure the reader for different operating modes, serial communication parameters, and tag protocol configurations.

The installation package contains several default configuration files for varying reader applications. Using one of these files can speed the initial configuration process by providing the core settings for an application. Appendix A describes how to utilize a default configuration file. Once a default configuration is loaded , additional configuration changes can be applied as described in the following section. It is good practice to save the reader configuration to an external file once all configuration settings are in place.

As shown in Figure 12, selecting a configuration area in the display will expand the tree into the various control registers used to configure the reader. When a single register is selected the individual register parameters are displayed. The parameter options are then displayed on the right side of the interface. Once you have modified the parameter settings, you can update the reader.



Serial Mode

○ Polled

● Continuous

☐ Add Persistance Flag

Path to XML Configuration Definition

C:\Program Files\SAMSys\RFCS\XML Data\MP9320_27.xml

Connected to Reader - COM 1

Figure 12 – *Reader Configuration Interface*

When a specific register parameter is selected, an option menu is displayed on the right side of the interface. The actual parameter values are selected from these menus. After changing a value, the register and parameter name change color.

Add Persistence Flag

This is the flag to save the register setting permanently. Selecting this option adds **`F:1`** to the end of the Configuration Write (Cw) command to save the register setting in non-volatile memory

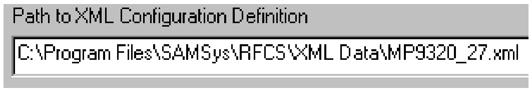
Save Changes To Reader

Pressing this button sends the configuration changes to the reader. The Configuration Write (Cw) command is used.

Save Current Configuration

Pressing this button saves the current configuration to an external file. After pressing this button, a navigation window is displayed for selecting the directory and filename for the configuration file.

Path to XML Configuration Definition



Path to XML Configuration Definition

C:\Program Files\SAMSys\RFCS\XML Data\MP9320_27.xml

The reader configuration options are described in an XML data file. The path and name of the XML file is entered in this field. To use the directory navigator, press the Browse button ... .

Chapter 3

RF Command Suite Operation

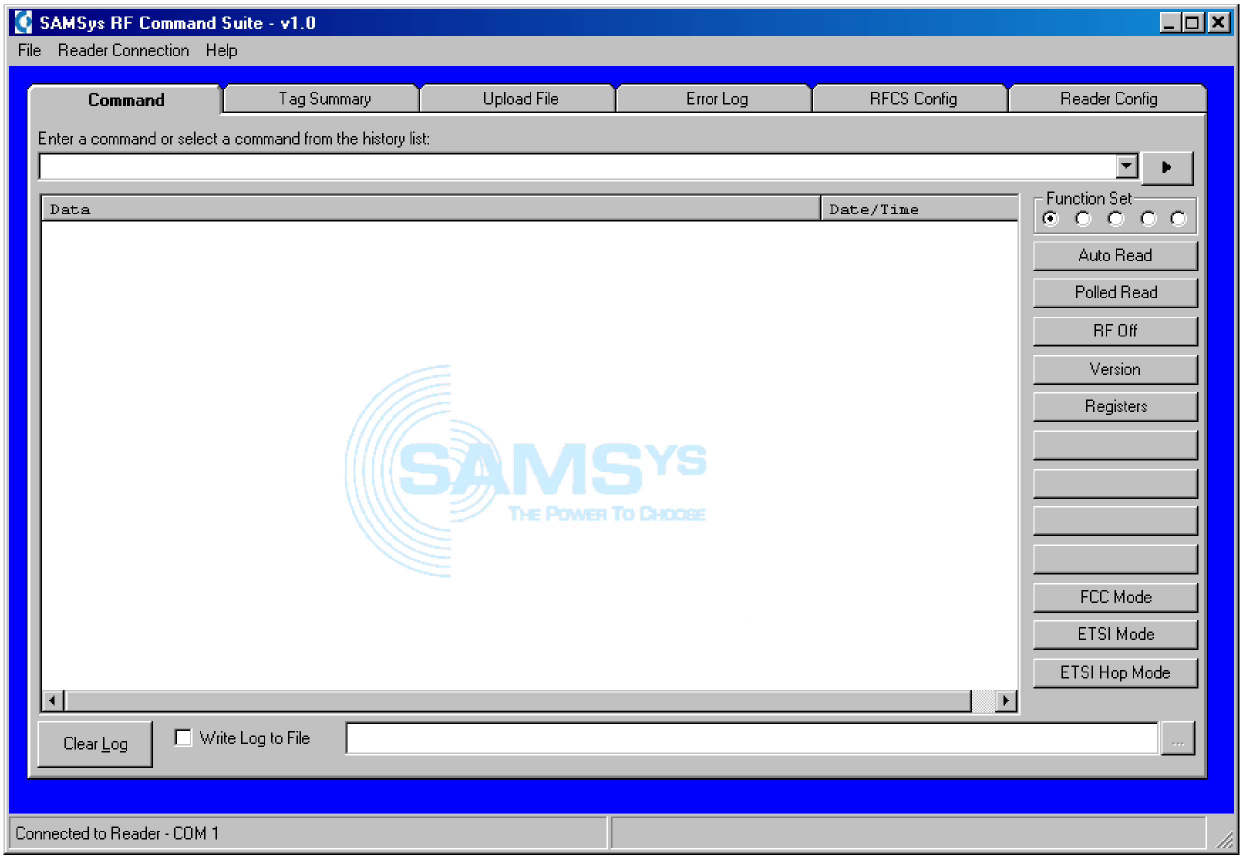
This chapter provides general information to operate RF Command Suite. Topics discussed in this chapter include the following:

- Loading a Function Key Macro File
- Reading Tags
- Writing Blank Tags
- Modifying Tags
- Sending CHUMP Commands to a Reader
- Uploading Firmware to a Reader
- Configuring the Reader

Loading a Function Key Macro File

RF Command Suite is designed to operate with any SAMSys reader. As a result, macro files are provided to program the function keys for specific reader types. If the RF Command Suite function keys have not been programmed or do not match your reader, perform the following:

1. From the pull-down menu, select **File** ⇨ **Macros** ⇨ **Load Macro File**.
2. Browse to the RFCS directory and select the macro file that matches your reader type and press **Open**.
3. The function keys will be programmed with default functions for that type of reader.



Connected to Reader - COM 1

Figure 13–*Main Screen after Function Keys Programmed*

Reading Tags

RF Command Suite is automatically configured to display tag data as the data is received from the reader. However, tool settings can be changed to match your requirements. Refer to the following sections to configure the RF Command Suite.

To read tags, perform the following:

1. Select the **Reader Config** Interface and verify your reader is programmed correctly.

2. Verify your reader is enabled for the correct tag protocol. Select:

   Reader Configuration ⇨ General Configuration ⇨ Operating Mode ⇨ Protocol Select Word

   Reader Configuration ⇨ General Configuration ⇨ Operating Mode ⇨ Protocol Select Mask

3. Verify the reader is configured for the correct operating mode. Select:

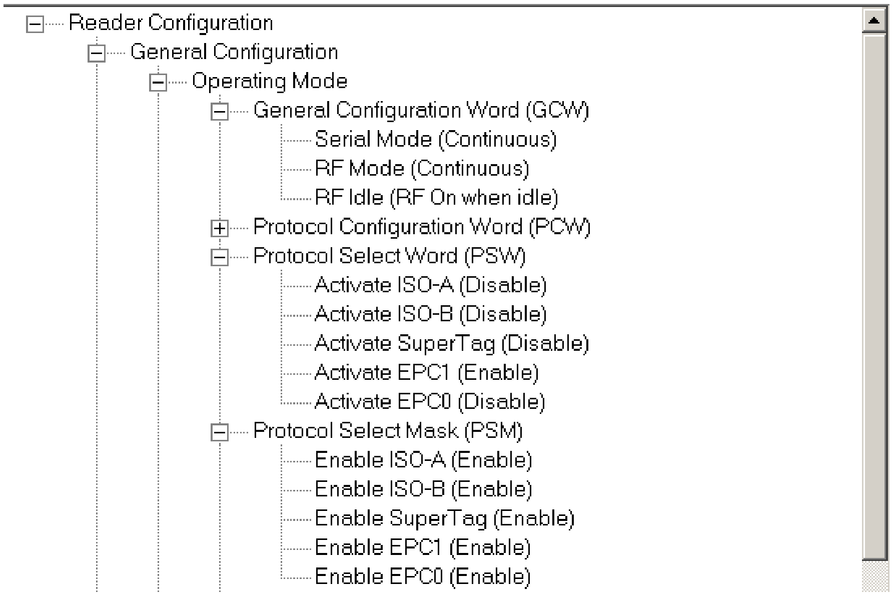
   Reader Configuration ⇨ General Configuration ⇨ Operating Mode ⇨ General Configuration Word

4. To configure the reader to actively scan for tags, set the following General Configuration Word parameters:

   Serial Mode = Continuous

   RF Mode = Continuous

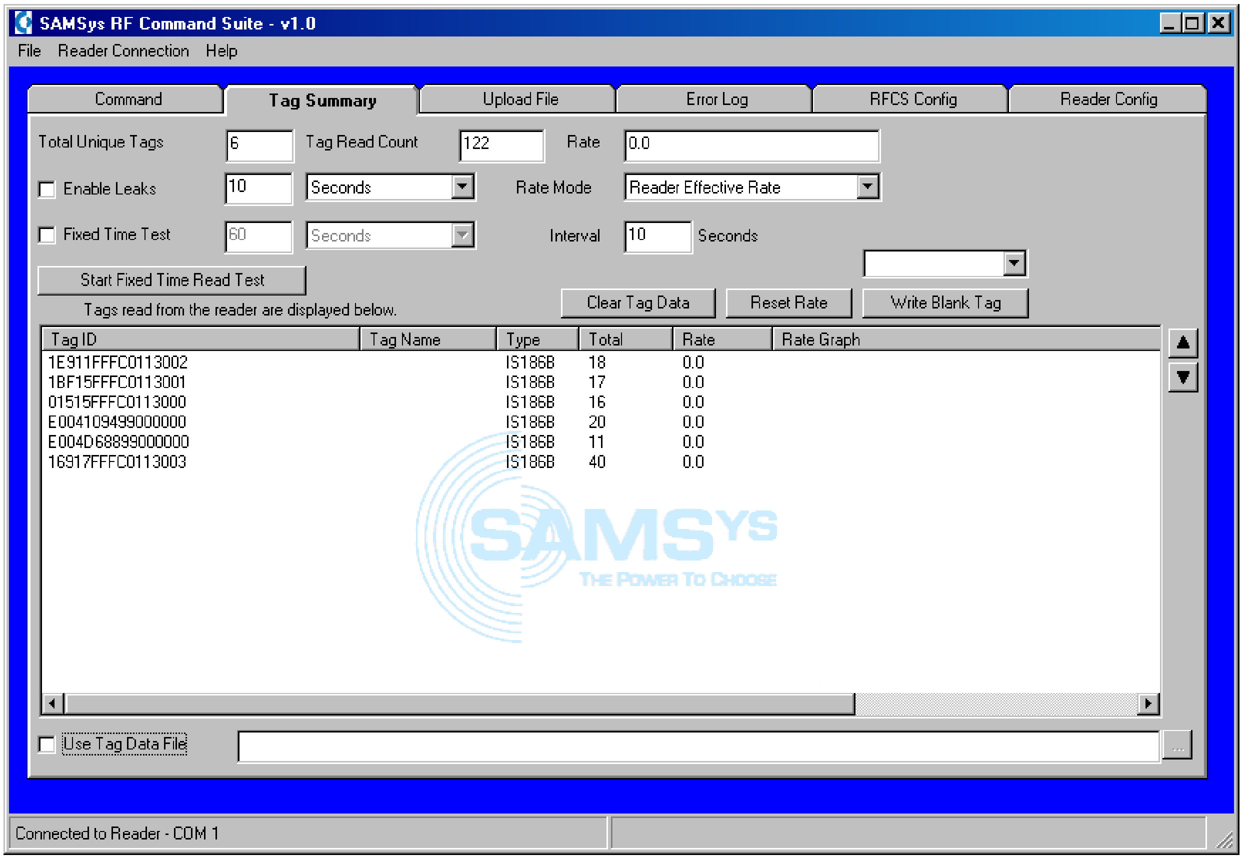
   RF Idle RF On when Idle



- ⊟ Reader Configuration
  - ⊟ General Configuration
    - ⊟ Operating Mode
      - ⊟ General Configuration Word (GCW)
        - Serial Mode (Continuous)
        - RF Mode (Continuous)
        - RF Idle (RF On when idle)
      - ⊞ Protocol Configuration Word (PCW)
      - ⊟ Protocol Select Word (PSW)
        - Activate ISO-A (Disable)
        - Activate ISO-B (Disable)
        - Activate SuperTag (Disable)
        - Activate EPC1 (Enable)
        - Activate EPC0 (Disable)
      - ⊟ Protocol Select Mask (PSM)
        - Enable ISO-A (Enable)
        - Enable ISO-B (Enable)
        - Enable SuperTag (Enable)
        - Enable EPC1 (Enable)
        - Enable EPC0 (Enable)

Figure 14–*Reader Configureation Parameters*

5. Select the **Tag Summary** interface. When tags are read, they are displayed in the window and the statistics are updated.



Total Unique Tags: 6
Tag Read Count: 122
Rate: 0.0
☐ Enable Leaks: 10 Seconds
Rate Mode: Reader Effective Rate
☐ Fixed Time Test: 60 Seconds
Interval: 10 Seconds

Tags read from the reader are displayed below.

Tag ID	Tag Name	Type	Total	Rate	Rate Graph
1E911FFFC0113002		IS186B	18	0.0	
1BF15FFFC0113001		IS186B	17	0.0	
01515FFFC0113000		IS186B	16	0.0	
E004109499000000		IS186B	20	0.0	
E004D68899000000		IS186B	11	0.0	
16917FFFC0113003		IS186B	40	0.0	

☐ Use Tag Data File

Connected to Reader - COM 1

***Figure 15**–RF Command Suite Tag Summary*

Data Persistence

Parsed tag data is removed from the lower window at a rate specified by the **Enable Leaks** delay value. If tag data disappears from the window faster than required, deselect **Enable Leaks** or increase the delay.

Fixed Time Test

RF Command Suite can be configured to read tags for a fixed time period. Enable the **Fixed Time Test** and enter a time interval. Press the **Start Fixed Time Read Test** button to start the read cycle. Tags are only read for the specified time interval.

Tag Read Count and Rate

The Tag Read Count displayed in the lower window is the total tag read count since the last reset. The Rate is the accumulative tag reads per second since the last reset.

If tag read rate data is cleared too quickly from the **Tag Summary** display, increase the **Interval**.

Reading Tag Data Files

Tag Data Files containing human readable tag names can be read by RF Command Suite. In most cases, these files are created for demonstration purposes. To use have RF Command Suite display human readable tag names from a file, select the **Use Tag Data File** option and browse for the file name.

Parsing Tag Data from an Incoming Data Stream

Tag data can be parsed out of an incoming data stream and displayed in the Tag Summary display window. Select the **Parse Received Data** option on the **RFCS Config** interface.

☑ Parse Received Data

Writing Blank Tags

RF Command Suite can be used to write unprogrammed or blank tags. To write blank tags, perform the following:

1. Select the **Command** Interface and verify the reader is connected and the correct protocol is selected.
2. Place the reader in **Polled Read** mode.
3. Verify a single tag is in the RF field of the reader.
4. Select the **Tag Summary** Interface.
5. Select the protocol from the pulldown above the **Write Blank Tag** button.

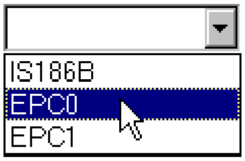


Figure 16–*Select Tag Protocol*

6. Press the **Write Blank Tag** Write Blank Tag button to begin the operation and display the tag data box.

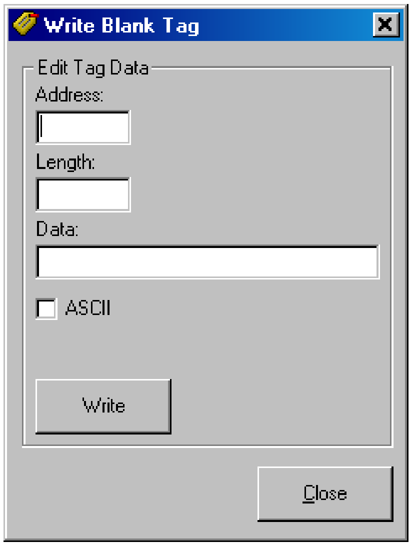


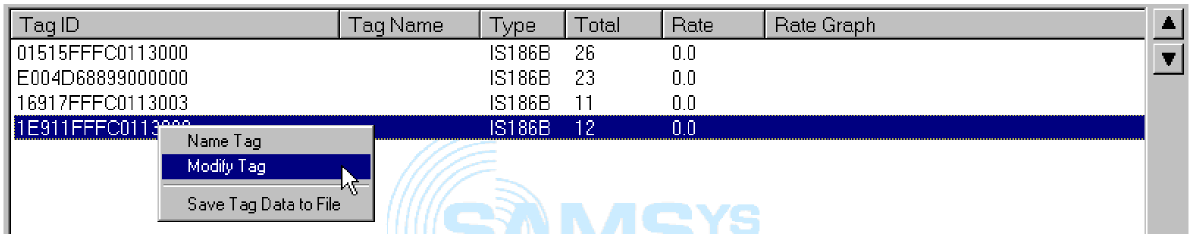
Figure 17–*Tag Write Data*

7. Fill in the appropriate data (in Hex) and press the **Write** Write button to write the data to the tag.

Modifying Tags

RF Command Suite can be used to modify previously programmed tag data. To modify tags, perform the following:

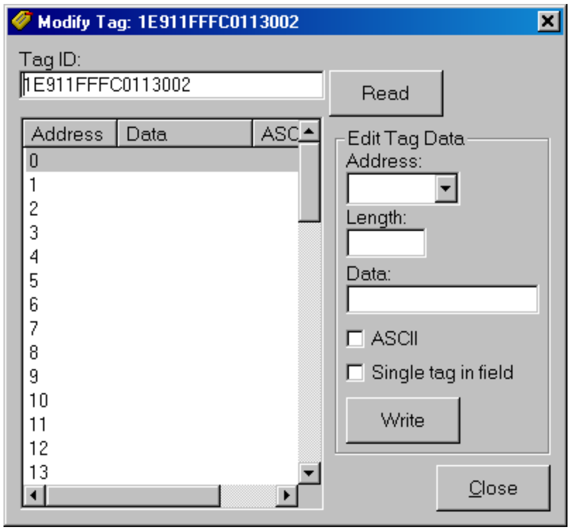
1. Select the **Tag Summary** Interface and right-click on the tag.



Tag ID	Tag Name	Type	Total	Rate	Rate Graph
01515FFFC0113000		IS186B	26	0.0	
E004D68899000000		IS186B	23	0.0	
16917FFFC0113003		IS186B	11	0.0	
1E911FFFC0113		IS186B	12	0.0	

Figure 18–Select Tag to Modify

2. Select **Modify Tag**. The tag data window is displayed.



Modify Tag: 1E911FFFC0113002

Tag ID: 1E911FFFC0113002

Figure 19–Modify Tag Option

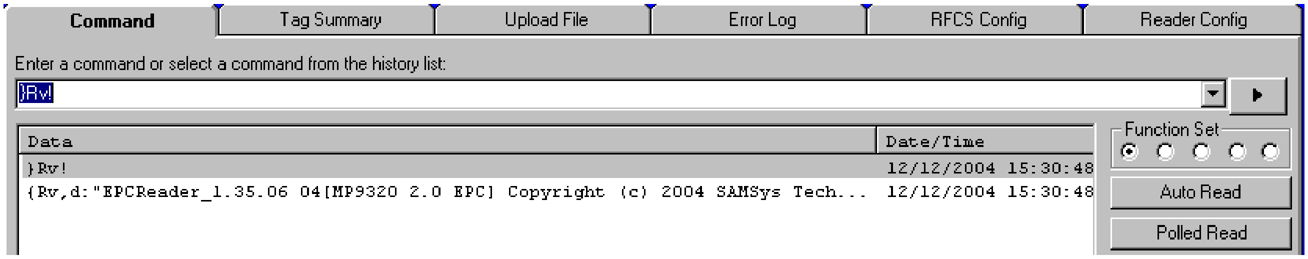
3. Select the **Address** from the pull-down.
4. Enter the data **Length** and actual **Data** for the specific address
5. Select if **ASCII** data and whether or not there is a **Single tag in field**.
6. After all data and parameters are entered, press **Write** Write.
7. Repeat for each address.

Sending CHUMP Commands to a Reader

Should you desire to perform more sophisticated reader functions or select additional configurations, RF Command Suite allows CHUMP commands to be entered directly.

To send CHUMP commands to a reader, perform the following:

1. Select the **Command** tab.
2. Input the CHUMP command into the command line and press the Send button ▶ or the **Enter** key on the keyboard.
3. The command is sent and the reader response is shown in the display window.



Enter a command or select a command from the history list:

`}Rv!`

```
Data                                                                      Date/Time
}Rv!                                                                      12/12/2004 15:30:48
{Rv,d:"EPCReader_1.35.06 04[MP9320 2.0 EPC] Copyright (c) 2004 SAMSys Tech...  12/12/2004 15:30:48
```

Function Set: ● ○ ○ ○ ○

Figure 20*–CHUMP Command Upload*

Caution

SAMSys readers are programmed using the Comprehensive Heuristic Uniform Messaging Protocol (CHUMP). Some CHUMP commands can disable the reader and should not be used unless directed by SAMSys technical personnel. Use extreme caution when sending CHUMP commands to the reader.

For detailed information on using CHUMP commands, refer to the SAMSys Comprehensive Heuristic Unified Messaging Protocol Reference Guide.

Uploading Firmware to a Reader

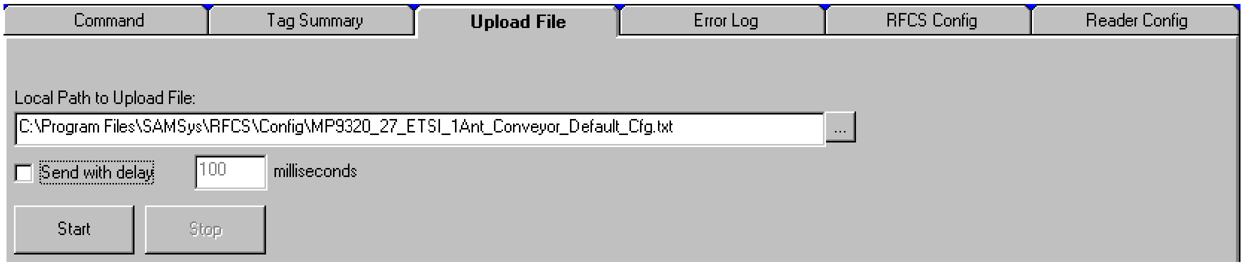
Periodically, SAMSys releases updated reader firmware that incorporates new protocols, enhanced features, and updated FlashROM images. SAMSys readers can be updated with new firmware using the RF Command Suite.

When uploading a file, RF Command Suite sends one line at a time and waits for the **`{a`** response from the reader before sending the next line. If an **`e:`** is received, indicating an error, the upload aborts.

The firmware file has a "**`.chp`**" extension and is typically included in a zipped release file such as "**`EPCReader_1.36.10.zip`**"

To upload firmware to a reader, perform the following:

1. Connect the reader to the PC using the RS-232 or Ethernet port as required.
2. Select the **Upload File** tab.
3. Browse to the file to upload. To use the directory navigator, press the Browse button ... .



Local Path to Upload File:
C:\Program Files\SAMSys\RFCS\Config\MP9320_27_ETSI_1Ant_Conveyor_Default_Cfg.txt

☐ Send with delay 100 milliseconds

Figure 21 – *Upload File Controls*

4. When uploading FORTH files, a time delay must be inserted between each line of the file. Select the **Send with delay** option and enter a time delay in milliseconds. A time delay is not necessary with **`.chp`** or configuration files.
5. When you are ready to upload the file, press **Start** Start .
6. The file will be uploaded to the reader. During upload, a bar graph indicates what percentage of the file has been sent.
7. If the file cannot be sent, a File Transfer Timeout error is displayed.

Configuring the Reader

RF Command Suite can be used to easily configure your reader. The Reader Config interface provides control over the reader configuration registers that set communication parameters, change operating modes, and control the transmitter and receiver. These configuration registers are located under **General Configuration**.

In addition, individual protocol configurations can be modified. The protocol configuration registers are located under **Protocol Configuration**.

If reader configuration commands have been recently sent from the command line or by pressing the function keys, the Reader Configuration window may not reflect the updated settings. Refresh the Reader Configuration window by collapsing and re-expanding the directories (see Figure 22). The updated settings should be displayed.

1. To configure the reader, select the **Reader Config** tab.

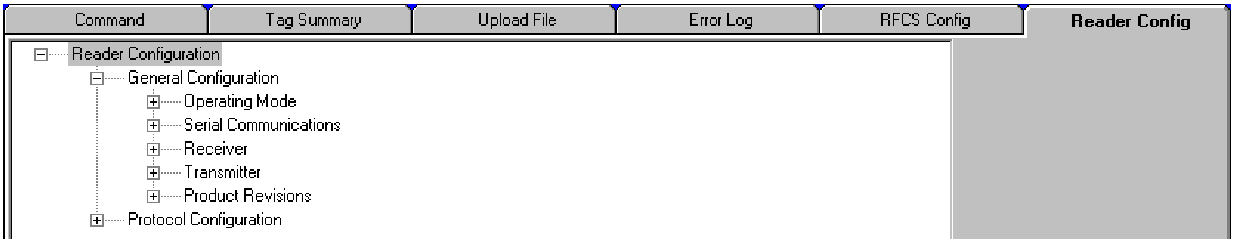


Figure 22 – *Reader Configuration*

2. To modify the general configuration registers expand the directory under **General Configuration**.
3. To modify the protocol configuration registers expand the directory under **Protocol Configuration**.

Caution

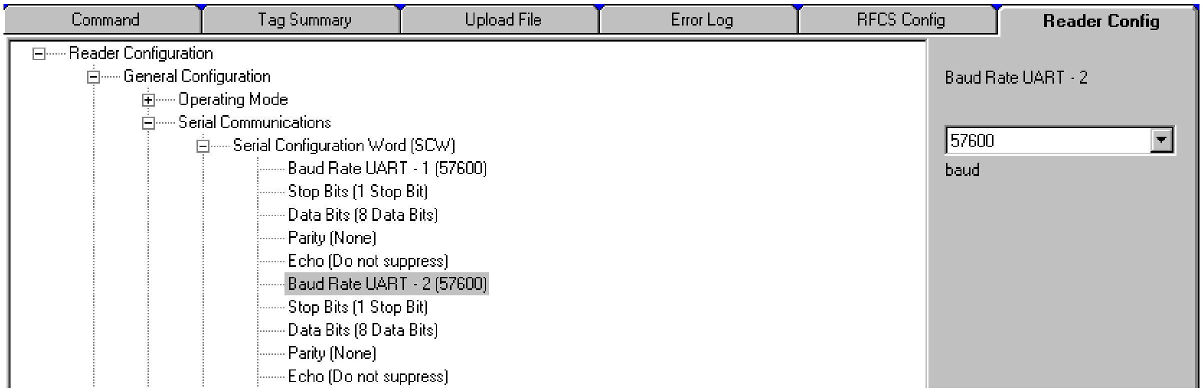
SAMSys readers use internal registers to provide a high degree of flexibility in setting operational parameters. However, improper setting of these registers can result in reader inoperability or permanent damage. For detailed information on reader and protocol configuration registers, refer to the Comprehensive Heuristic Uniform Messaging Protocol (CHUMP) Reference Guide *and the* Field Installation Guide*.*

NOTE: *To make any reader changes permanent, the changes must be written to non-volatile memory (NVM). To make changes permanent, select the Persistence Flag option* ☐ Add Persistance Flag *before sending the change to the reader.*

Changing the RS-232 Configuration

To confiure the reader’s serial port parameters, perform the following:

1. Select the RS-232 UART parameters as shown in the following:



- Reader Configuration
  - General Configuration
    - Operating Mode
    - Serial Communications
      - Serial Configuration Word (SCW)
        - Baud Rate UART - 1 (57600)
        - Stop Bits (1 Stop Bit)
        - Data Bits (8 Data Bits)
        - Parity (None)
        - Echo (Do not suppress)
        - Baud Rate UART - 2 (57600)
        - Stop Bits (1 Stop Bit)
        - Data Bits (8 Data Bits)
        - Parity (None)
        - Echo (Do not suppress)

Baud Rate UART - 2

57600 baud

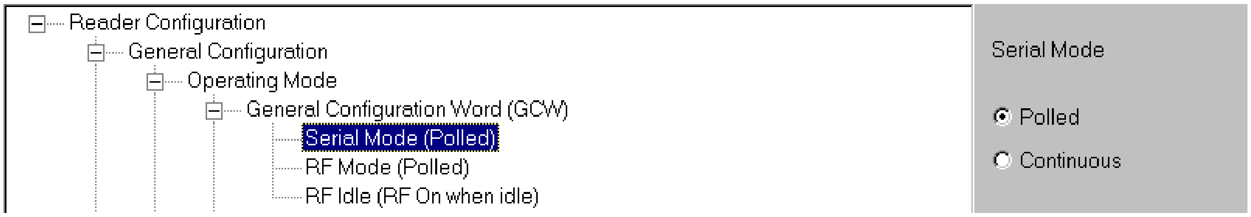
Figure 23 – *RS-232 Serial Port Configuration*

2. Make any changes using the pull-down menus and selectors on the right side of the display and press **Send Changes to Reader** Send Changes to Reader.

Changing Reader Operation Modes

The reader’s serial and RF modes can be configured for polled or continuous operation. In addition, the RF On when Idle mode can be set. To change any of the operating modes, perform the following:

1. Select the specific General Configuration Word (GCW) parameters as shown in the following:



- Reader Configuration
  - General Configuration
    - Operating Mode
      - General Configuration Word (GCW)
        - Serial Mode (Polled)
        - RF Mode (Polled)
        - RF Idle (RF On when idle)

Serial Mode

● Polled

○ Continuous

Figure 24 – *Serial and RF Mode Configuration*

2. Make any changes using the selectors on the right side of the display and press **Send Changes to Reader** Send Changes to Reader.

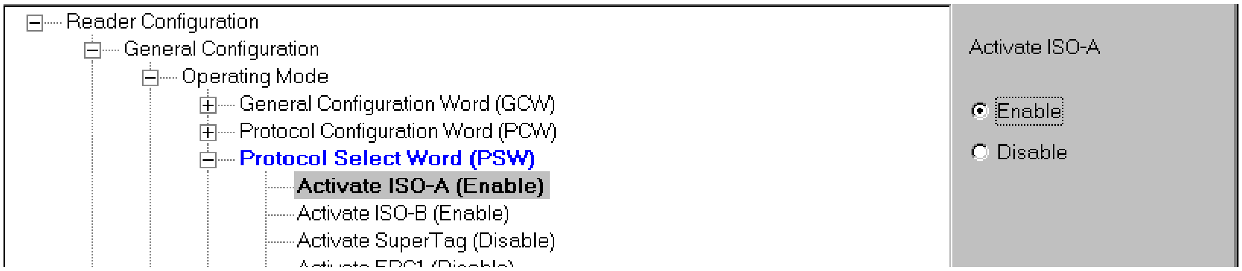
Enabling Protocols

SAMSys readers can be configured with different tag protocols. If your reader was loaded with specific protocols at the time of purchase, these protocols can be enabled or disabled as required. To verify which protocols are enabled for your reader, select:

Reader Configuration ⇨ General Configuration ⇨ Operating Mode ⇨ Protocol Select Mask

To configure the reader for a specific protocol, perform the following:

1. Select the Protocol Select Word (PSW) parameters as shown in the following:



- ⊟ Reader Configuration
  - ⊟ General Configuration
    - ⊟ Operating Mode
      - ⊞ General Configuration Word (GCW)
      - ⊞ Protocol Configuration Word (PCW)
      - ⊟ **Protocol Select Word (PSW)**
        - **Activate ISO-A (Enable)**
        - Activate ISO-B (Enable)
        - Activate SuperTag (Disable)

Activate ISO-A

● Enable

○ Disable

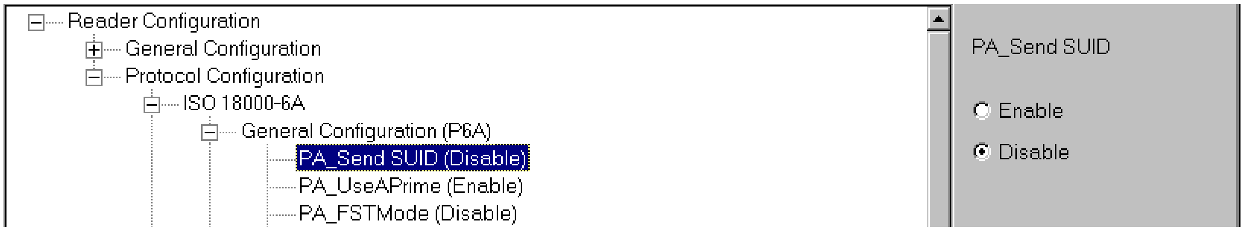
Figure 25 – *Protocol Selection*

2. Enable or disable a protocol by using the selectors on the right side of the display and press **Send Changes to Reader** Send Changes to Reader.

Configuring Specific Protocols

Individual Protocol Configuration registers can be modified for specific tag types and read modes. For specific protocol configuration register information, refer to the *Comprehensive Heuristic Uniform Messaging Protocol (CHUMP) Reference Guide*. To configure individual protocol registers, perform the following:

1. Select the individual protocol configuration word parameters.



- ⊟ Reader Configuration
  - ⊞ General Configuration
  - ⊟ Protocol Configuration
    - ⊟ ISO 18000-6A
      - ⊟ General Configuration (P6A)
        - **PA_Send SUID (Disable)**
        - PA_UseAPrime (Enable)
        - PA_FSTMode (Disable)

PA_Send SUID

○ Enable

● Disable

Figure 26 – *Protocol Parameter Configuration*

2. Enable or disable a specific protocol parameter by using the selectors on the right side of the display and press **Send Changes to Reader** Send Changes to Reader.

Chapter 4

Function Keys and Macros

This chapter provides descriptions of the RF Command Suite function keys and function key macro files. Topics discussed in this chapter include the following:

- Function Key Descriptions
- Modifying Function Keys
- Writing a Function Key Macro File

Function Key Descriptions

Several function key macro files are provided with RF Command Suite to simplify basic tasks performed with the application. The following tables describe the function key definitions provided by the macro files.

MP9320 V2.7 EPC UHF Reader Function Keys

File Name: **`MP9320_27_Default.txt`**

Function Key Set 1

F1	**Auto Read**	Sets the reader to read tags continuously.
F2	**Polled Read**	Sets the reader to read tags only after a request from the host.
F3	**RF Off**	Turns the reader RF off.
F4	**Version**	Returns the reader software version.
F5	**Registers**	Shows the current register configuration.
F6	not programmed	
F7	not programmed	
F8	not programmed	
F9	not programmed	
F10	**FCC Mode**	Configures the reader for FCC mode.
F11	**ETSI Mode**	Configures the reader for ETSI mode.
F12	**ETSI Hop Mode**	Configures the reader for ETSI frequencu hopping.

Function Key Set 2

F1	**ISO-6A**	Selects the ISO 18000-6A protocol only.
F2	**ISO-6A 4X Return**	Selects ISO 18000-6A with 4X return link.
F3	**ISO-6A/B**	Selects both ISO 18000-A and -6B protocols.
F4	**ISO-6B**	Selects the 6B protocol only.
F5	**ISO-6A 4X Return**	Selects ISO 18000-6B with 4X return link.
F6	**V1.19 EPC/96**	Selects Philips UCODE V1.19 (96-bit tags)
F7	**V1.19 EPC/64**	Selects Philips UCODE V1.19 (64-bit tags)
F8	**Intellitag**	Selects the Intellitag protocol only.
F9	**Supertag**	Selects the Supertag protocol only.
F10	not programmed	
F11	not programmed	
F12	not programmed	

Function Key Set 3

F1	**EPC 1/64**	Selects the EPC 1 protocol (64 bit tags).
F2	**EPC 1/96**	Selects the EPC 1 protocol (96 bit tags).
F3	**EPC 0/Impinj/96**	Selects the Impinj EPC 0 protocol (96 bit tags).
F4	**EPC 0/Impinj/64**	Selects the Impinj EPC 0 protocol (64 bit tags).
F5	**EPC 0/Impinj/Any**	Selects any Impinj EPC 0 protocol
F6	**EPC 0/Matrics/64**	Selects the Matrics EPC 0 protocol (64 bit tags).
F7	**EPC 0/Matrics/96**	Selects the Matrics EPC 0 protocol (96 bit tags).
F8	**EPC 0/Matrics/Any**	Selects any Matrics EPC 0 protocol
F9	**Matrics0+ Writing**	Configures reader for writing Matrics0+ tags.
F10	not programmed	
F11	not programmed	
F12	not programmed	

Function Key Set 4

F1	**1 Antenna (0)**	Sets the reader to use antenna 0.
F2	**1 Antenna (1)**	Sets the reader to use antenna 1
F3	**1 Antenna (2)**	Sets the reader to use antenna 2.
F4	**1 Antenna (3)**	Sets the reader to use antenna 3.
F5	**2 Antennas (0,1)**	Sets the reader to use antennas 0, 1.
F6	**3 Antennas (0,1,2)**	Sets the reader to use antennas 0, 1, and 2.
F7	**4 Antennas**	Sets the reader to use all four antennas.
F8	not programmed	
F9	not programmed	
F10	not programmed	
F11	not programmed	
F12	not programmed	

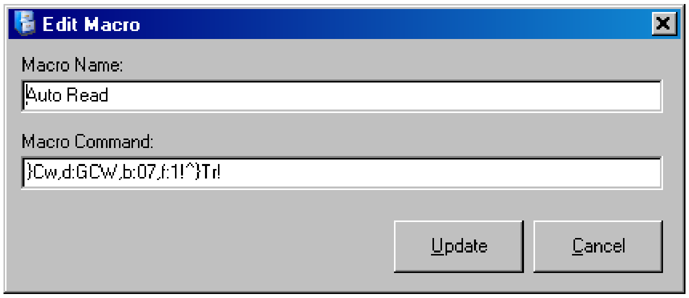
Warning

The SAMSys MP9320 UHF Reader is equipped with four RF ports. To prevent reader damage, RF ports must be properly terminated with a 50 ohm load or a functional UHF RFID 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 loads or antennas are connected. Always power down the reader before removing an antenna or load from an RF port.

Modifying Function Keys

RF Command Suite is designed to operate with any SAMSys reader. As a result, macro files are provided to program the function keys for specific reader types. If the RF Command Suite function keys have not been programmed or do not match your reader, perform the following:

1. From the pull-down menu, select **File ⇨ Load Macro File**.
2. Browse to the RFCS directory and select the macro file that you wish to use and press **Open**.
3. Right-click the specific function key to program and select **Edit Macro**.



Macro Name: Auto Read

Macro Command: `}Cw,d:GCW,b:07,f:1!^}Tr!`

Figure 27 – *Editing a Macro*

4. Enter a name for the function key into the **Macro Name** field. This name will be displayed on the key.
5. Enter the function key command in the **Macro Command** field. This can be any valid CHUMP command to the reader.
6. Save the function key definition by pressing the **Update** Update button.

Creating a Function Key Macro File

Creating a Macro File with the On-Screen Key Editor

To create a macro file with the on-screen key editor, perform the following:

1. Start RF Command Suite.
2. Select **File ⇨ Create Macro File** and enter a name for the text file.
3. Select **Save.**
4. The function keys will be blank.
5. Right click on each key and enter a name for the function key into the **Macro Name** field. This name will be displayed on the key.
6. Enter the function key command in the **Macro Command** field. This can be any valid CHUMP command to the reader.
7. Save the function key definition by pressing the **Update** Update button.
8. After programming all the required function keys, select **File ⇨ Save Macro File**.

Creating a Macro File with a Text Editor

RF Command Suite function keys can be also be programmed by writing a simple text (*.txt) file using a text editor. This file should be formatted as follows:

```
<Function Key 1 name>
<Function Key 1 CHUMP command>
<Function Key 2 name>
<Function Key 2 CHUMP command>
<Function Key 3 name>
<Function Key 3 CHUMP command>
.
.
<Function Key 12 name>
<Function Key 12 CHUMP command>
.
.
<Function Key 60 name>
<Function Key 60 CHUMP command>
```

To leave a function key blank, skip two (2) lines in your file. To program Function Sets 2-5, continue adding key names and commands.

Chapter 5

Troubleshooting and Support

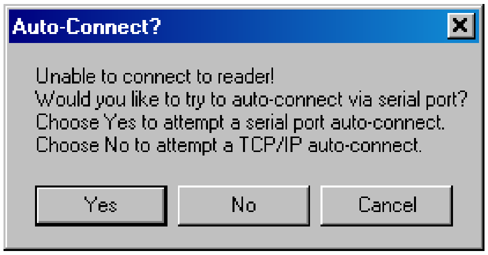
This chapter provides basic RF Command Suite troubleshooting procedures and also how to obtain technical support. Topics discussed in this chapter include the following:

- Troubleshooting Procedures
- SAMSys Technical Support

Troubleshooting Procedures

Serial Connection Problem

Most problems with RF Command Suite can be easily solved by verifying your reader connections and communication parameters. The following message occurs when RF Command Suite is unable to connect to the reader with the last known settings.



Auto-Connect?

Unable to connect to reader!
Would you like to try to auto-connect via serial port?
Choose Yes to attempt a serial port auto-connect.
Choose No to attempt a TCP/IP auto-connect.

Figure 28–*RF Command Suite Connection Error Message*

If the baud rate is incorrect, press **YES** and the reader will search for the correct speed. If you are connected on TCP/IP, press **NO**.

If the reader is unable to connect, check any serial or Ethernet cables and power connections to your reader. If necessary, communication parameters can be manually configured. Refer to Chapter 1 - *Introduction* for information on serial and Ethernet communication setup.

Other Common Problems

Symptom/Error Msg	Probable Cause	Corrective Action
Tags or tag data disappears too quickly from the display.	Leaks Enabled	Disable Leaks or increase Leak Interval on Tag Summary interface.
	Rate Interval too short	Increase Rate Interval on Tag Summary interface.
Reader Configuration tree in Reader Configuration interface does not appear to be accurate.	Reader configuration was modified by sending commands directly from the Command interface command line or from another program.	Collapse and re-expand the Reader Configuration directory tree to refresh the information.

SAMSys Technical Support

For any questions regarding products and services, including returns, repairs, technical support, training, and all other available services, contact your distributor or SAMSys Customer Service at the following:

E-mail	support@samsys.com
Telephone	1-877-367-4342 (toll free) 8:00am-6:00pm EST, Mon-Fri
Fax	1-919-281-1551

Appendix A

Common Procedures

This appendix provides examples of commonly performed RF Command Suite procedures. These examples are provided for general guidance only and are designed to offer assistance in getting started with RF Command Suite. Specific applications may require more detailed procedures not illustrated here. Contact SAMSys Technical Support for more information.

Common procedures provided in this appendix include:

- High Level Reader Startup and Configuration

High Level Reader Startup and Configuration

1. Ensure all power and antenna cables are conencted to the reader.
2. Power up the reader.
3. Start RF Command Suite.
4. Specify **Connect via Serial Port** or **Connect via TCP/IP** from the **Reader Connection** pull-down menu.
5. Select **Auto Connect** from the **Reader Connection** pull-down menu.
6. Select the Upload File interface tab and browse to the **Program Files\SAMSys\RFCS\Config** directory.
7. Select the reader configuration file that best matches your application and press **Start**.
8. Select the **Reader Config** interface tab and review any reader configuration parameters.
9. Customize any configuration parameters required by your application.
10. Save the current configuration to an external file. This file can be used to restore reader settings using the **File Upload** function.

Appendix B

COM/ActiveX Compatibility

RF Command Suite is being developed as an ActiveX executable (.exe application). This will allow development packages compatible with COM/ActiveX to use the .exe file for this application as a development library. The classes included in the application are described in this appendix:

- SSReader Class
- SSTag Class

SSReader Class

This class is used as the primary interface for controlling, communicating, and connecting with the reader. The properties, collections, methods, and events for this class are described in the following table:

Type	Name	Description
Property	Connection Mode	Sets the connection mode for RF Command Suite to communicate with the reader. The settings for this property are, cmTCPIP = 0, cmRS232 = 1.
Property	CommSettings	Structure that holds all of the comm port settings. The items in this structure include: • Baud Rate - Sets the speed at which to transfer data • Data Bits - Sets the number of data bits to use. • Stop Bits - Sets the number of stop bits to use. • Parity - Sets the parity to use.
Property	TCPIPSettings	Structure that holds the settings for communicating with the reader via TCP/IP. The items in this structure are as follows: • IPAddress - IP address of reader to connect to • IPPort - TCP port to communicate with the reader
Property	ParseData	Boolean value that is used as a flag to determine if the incoming data should be parsed to look for tag reads
Property	TotalTagReads	(Read-only). Used to return the total number of tag reads for all tags being currently displayed.
Event	DataReceived	(InData As String). Triggered when data is received from the reader. The parameter InData will contain the message from the reader.
Event	CommError	(Number As Integer, Description As String). Triggered when there is a communications error. The parameters for this event include the number and description of the error that occurred.
Event	TagAdded	(newTag As SSTag). Triggered whenever a new tag is added to the tags collection. This occurs when a previously unread tag is read by the reader. The newTag parameter will contain the data for the new tag.
Event	TagRemoved	(OldTag As SSTag). Occurs when a tag is removed from the tags collection. This is triggered by the TagRemoved event of the tags collection. The OldTag parameter will contain the data for the removed tag.
Event	TagChanged	(ModifiedTag As SSTag). Triggered whenever a tag is modified in the tags collection. This occurs when a currently displayed tag is read by the reader. The ModifiedTag parameter will contain the data for the changed tag.
Method	AutoConnect	Used to auto-connect to the reader. This method will attempt to connect to the reader on all ports at all supported baud rates with Parity = n, Stop Bits = 1, Data Bits = 8. This method returns a Boolean value, True if the reader is connected, False if not.

Type	Name	Description
Method	ConnectToReader	When called, this method will attempt to connect to the reader using the stored settings. This method returns a Boolean value: True if the reader is connected, False if not.
Method	DisconnectReader	Closes the connection to the reader.
Method	ResetReader	Attempts a serial reset on the reader. This method sends a series of carriage returns to the reader at the settings Baud = 9600, Parity = n, Stop Bits = 1, Data Bits = 8. This method will run until it times out or connects to the reader.
Method	SendData	Used to submit data to the reader. This method appends a carriage return to the data and sends it to the reader.
Method	TestPort	(PortNum as Integer). Attempts to open the port specified in the parameter. Returns a Boolean value: True if the port is valid, False if not.
Method	IsConnected	Tests the connection to the reader and returns whether or not the reader is connected. Returns a Boolean value: True if the reader is connected, False if not.

Tags Collection

The **Tags** collection of the SSReader class is a collection of SSTag objects based on the SSTag class. This collection contains one tag object for each tag in the display. This collection provides the following:

Type	Name	Description
Event	TagRemoved	(OldTag as SSTag) Occurs when a tag is removed from the collection (when the Remove method is called). The parameter for this event contains an SSTag object containing the data for the removed tag.
Event	Property	Item (index or key). Returns the SSTag object matching the specified index or key.
Property	Count	Returns the number of SSTag objects in the collection.
Property	NewEnum	This property is included to allow *For Each* looping to support development languages.
Method	Clear	Removes all SSTag objects from the collection.
Method	Add	(TagID As String, Optional sKey As String) Creates a new SSTag object and adds it to the collection.
Method	Remove	(index or key) Removes the SSTag object that matches the index/key from the collection, and then trigger the TagRemoved event.

SSTag Class

This class is used as internal representation of a tag that is read by the reader, and provides an interface for tag information. The properties, collections, and methods for this class are described in thew following table:

Type	Name	Description
Property	TagID	String containing the hex tag ID
Property	TagType	String containing the tag type.
Property	TotalReads	Numeric(Long) value containing the total number of times the tag has been read.
Property	LastRead	Date value containing the last date and time the tag was read.
Property	RateReadCount	(RateInterval As Long). Numeric(Double) value that returns the number of tag reads in the specified rate interrval.
Property	RateCharCount	(RateInterval As Long). Numeric(Double) value that returns the number of received characters in the specified rate interval.
Method	AddRead	(ReadCount As Long, CharCount As Integer). Used to add a tag read to the tag information. This information is used in turn to calculate rate.

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