HF Reader System Series 6000

S6500/S6550 Reader - Firmware Upgrade

Reference Guide

11-06-21-065 July 2002

TI-RFid
A TEXAS INSTRUMENTS TECHNOLOGY

Contents

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Edition Two – July 2002

This is the second edition of this reference guide. It contains a description of how to change the firmware and configuration of an S6500/S6500 Reader.

For use with the following products:

S6500 Long Range Reader Module - RI-STU-650A

S6550 Long Range Reader (Housed) - RI-STU-655A

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PREFACE

Read This First

About this Manual

This **Reference Guide** is written for the sole use by TI-RFid Customers who are engineers experienced with TI-RFid and Radio Frequency Identification Devices (RFID).

Conventions

Certain conventions are used in order to display important information in this manual, these conventions are:

WARNING:

A warning is used where care must be taken or a certain procedure must be followed, in order to prevent injury or harm to your health.

CAUTION:

This indicates information on conditions, which must be met, or a procedure, which must be followed, which if not heeded could cause permanent damage to the system.

Note:

Indicates conditions, which must be met, or procedures, which must be followed, to ensure proper functioning of any hardware or software.

Information:

Information which makes setting up, or procedures, that make the use of the equipment easier, but is not detremental to its operation.

If You Need Assistance

For more information, please contact the sales office or distributor nearest you. This contact information can be found on our web site at: **http://www.ti-rfid.com**.

S6500/S6500 Reader - Firmware Upgrade

J.A.Goulbourne

Abstract

The S6500/S6550 Reader has its operating firmware loaded into flash memory, which controls the operation of the unit. This firmware configures operating parameters and controls, for instance, the transmitter and receiver functionality, enabling optimum performance.

To enable our customers to ensure their readers have the latest firmware, this document describes how to upgrade the reader firmware and re-configure any custom configuration settings.

The Customer will be notified by TI-RFID either directly or by a mail shot or via the Internet Web site **http://www.ti-rfid.com** if any upgrade to the firmware is available. Details of how to obtain this upgrade will be included in the notification.

1 S6500/S6550 Reader

The S6500 Reader Module is shown in Figure 1. This reader is also available as housed version including power supply under the name S6550. The upgrade procedure for the firmware is the same for both versions.

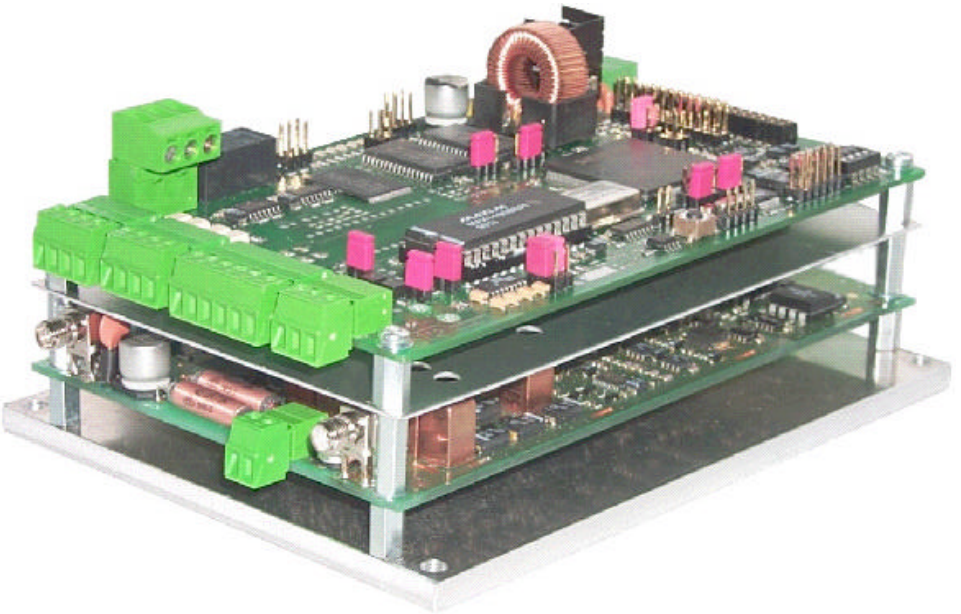

Figure 1. S6500 Reader Module

Information:

Installation, powering and connecting to the Host Computer is covered in the appropriate Reader Reference Guides (11-06-21-059, 11-06-21-060, 11-06-21-064) and is beyond the scope of this document.

2 Overview of the Operations Required

This section is a brief overview of the procedure how to change to the latest Firmware.

Information:

The Customer will be notified by TI-RFID either directly or by a mail shot or via the Internet Web site **http://www.ti-rfid.com** if any upgrade to the firmware is required. Details of how to obtain this upgrade will be included in the notification.

2.1 Flash Loading the Firmware

- Insert a 'shorting link' across Jumper J5. This is the SET position
- Run Siemen's Memtool flash loader program
- Erase the present memory contents
- Load the "BDt-31000.hex" (or latest) flash file & program
- Remove the 'shorting link' across Jumper J5 and RESET the reader by pressing switch S1.

2.2 Using "S6 Reader Utility" Tool to Customize the Parameters.

- Start "S6 Reader Utility"
- Change the Baudrate and establish communications with the reader
- Select the different Configuration menus, change and write any parameters that require modification
- Test

3 Flash Loading the Latest Firmware

3.1 Downloading the Files

On the Texas Instrument's website http://www.ti-rfid.com you can find the programming tool "MEMTOOL".

Create a suitable directory (e.g. C:\S6500) and unzip the Memtool files into it and a sub-directory for the Firmware Files. (e.g. C:\S6500\Flash). Running 'Memtool.exe' will install the flash loader software ready for use.

3.2 Setting the Loader Jumper

Set Jumper J5 and then press the RESET Button S1 on the Reader. This places the Reader into the Flash loader mode.

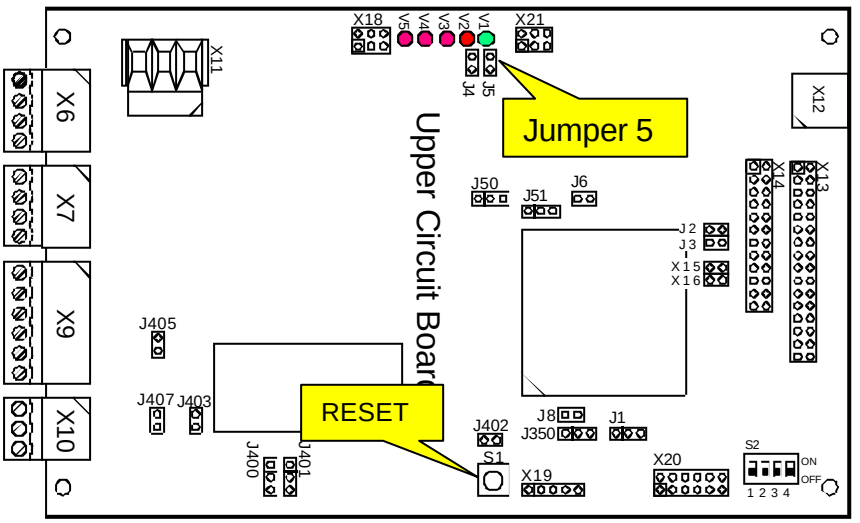

Figure 2. Jumper 5 & RESET Button Locations

3.3 Starting the Flash Loader

After starting the flash loader program "Memtool.exe", you will get the following screen:

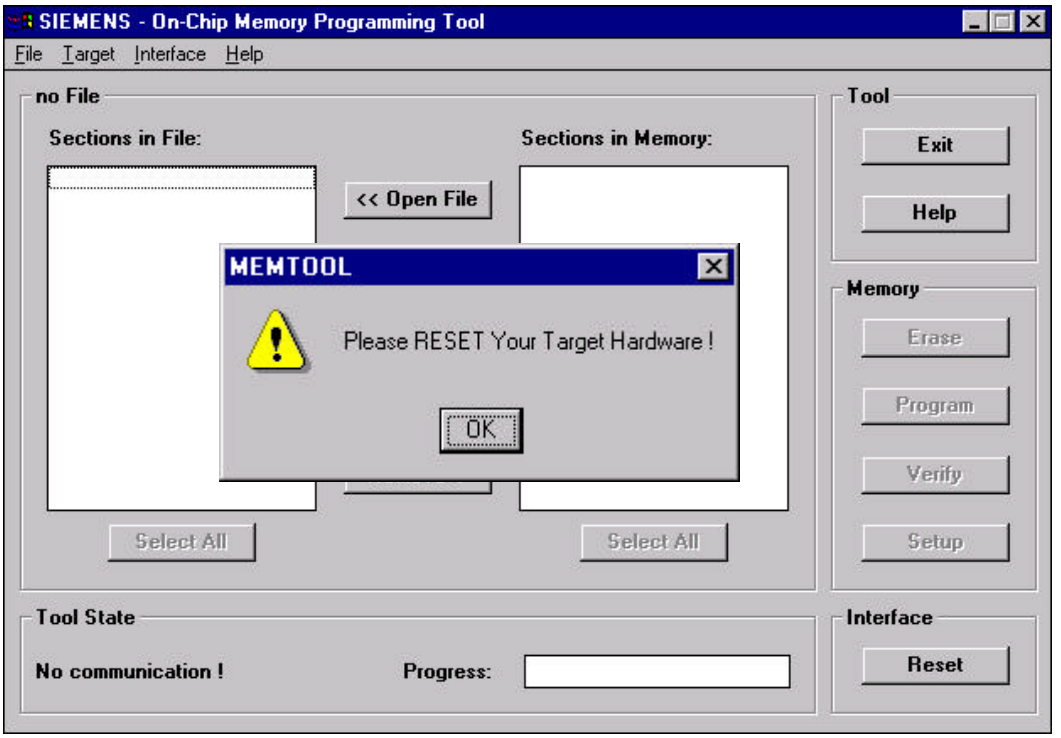

Figure 3. Memtool Initial Screen

Press the **RESET** button S1 on the Reader and click on '**OK**'. If you get the error message shown in Figure 4, it could be because Jumper 5 is not correctly positioned or you may need to setup the communications. Open menu **'Interface' - 'Setup** Interface' and check the settings.

Figure 4. Communication Error Message

Selecting "**Interface**" - "**Setup Interface**" will bring up the window shown in Figure 5. Set the **Com-Interface** to the correct one for your Host Computer connection and check that "**19200**" baud is enabled.

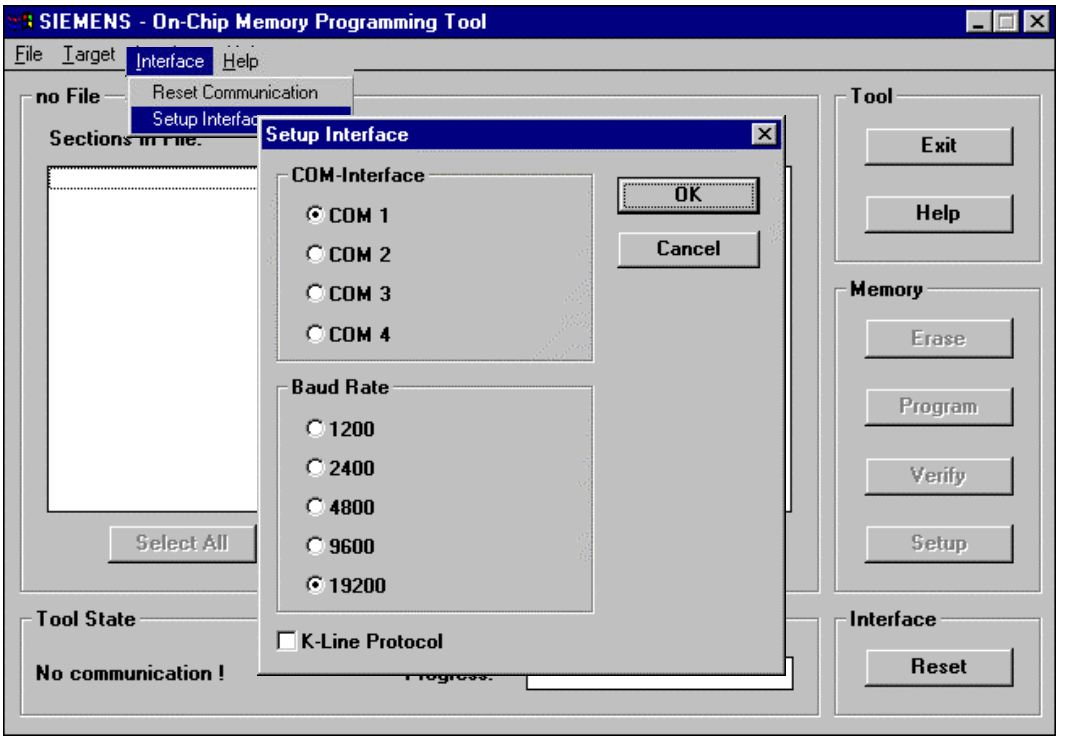

Figure 5. The Setup Interface

Do not tick the "**K-Line Protocol**" box. If you now click '**OK**' you will get the "Please RESET Your Target Hardware !" message box again.

Figure 6. Reset Box

Reset the reader again and click on '**OK**' and you should see the '**Tool State**' box change to "**Initializing**" and then go to "**Ready**".

3.4 Selecting the Target

The first time Memtool is run, you will need to select the target. Clicking on the '**Target**' menu will bring up the box shown in Figure 7. Select S6500/S6550.

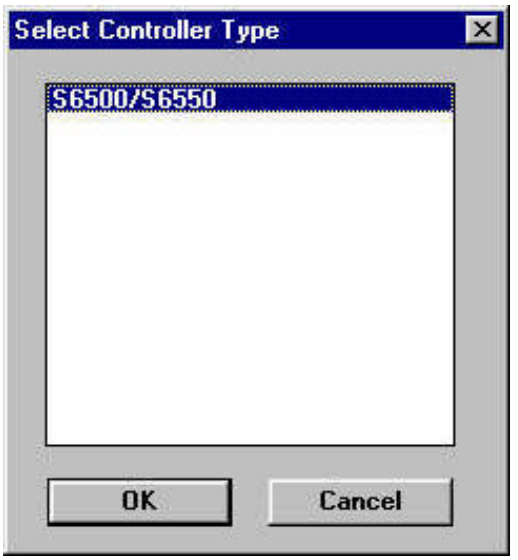

Figure 7. Target Box

3.5 Erasing the Reader Memory

Once "**Ready**" is shown in the Tool State box, you can erase the old program from the reader's memory.

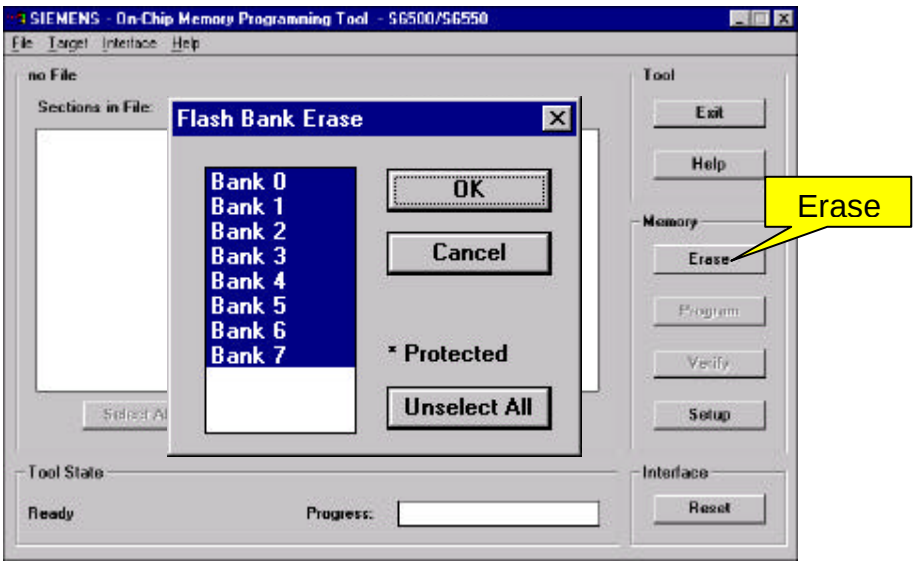

Figure 8. The Erase Button

Pressing the '**Erase**' button brings up the '**Flash Bank Erase**' window (Figure 8). Click on '**Select All**' and press '**OK**'. The progress bar will show you the progress of the erase operation. When it is complete, you are now ready to select and load the correct flash file.

3.6 Selecting and Loading the Flash File

In your directory '**.. '\S6500\Flash**' is file '**BDt-31000.hex**' or the latest version. This flash file will be truncated by MEMTOOL and displayed as '**bdt-31~1.hex'**.

Pressing "**<<Open File**" will bring up the screen shown in Figure 9. Select the correct path to your file and click on '**OK**'. The first time Memtool is run, you will have to set the path structure to point to the correct directory

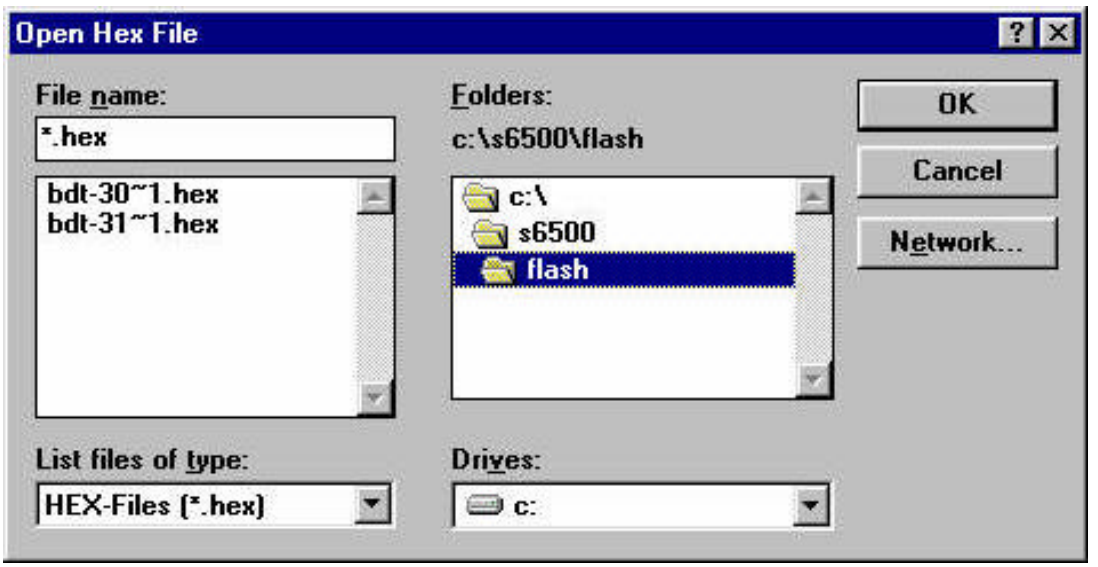

Figure 9. The 'Open Hex File' Screen

The data will now be displayed in the left hand box (see Figure 10). Click on ' **Select All** ', and then ' **->Add->** ' and the data will be transferred to the right hand box. Click on ' **Select All** ' again and finally ' **Program** ' to transfer the file to the Reader.

Once again a progress box will indicate how the operation is going. After '100%' has been reached, the operation is complete and the ' **Exit** ' button can be clicked.

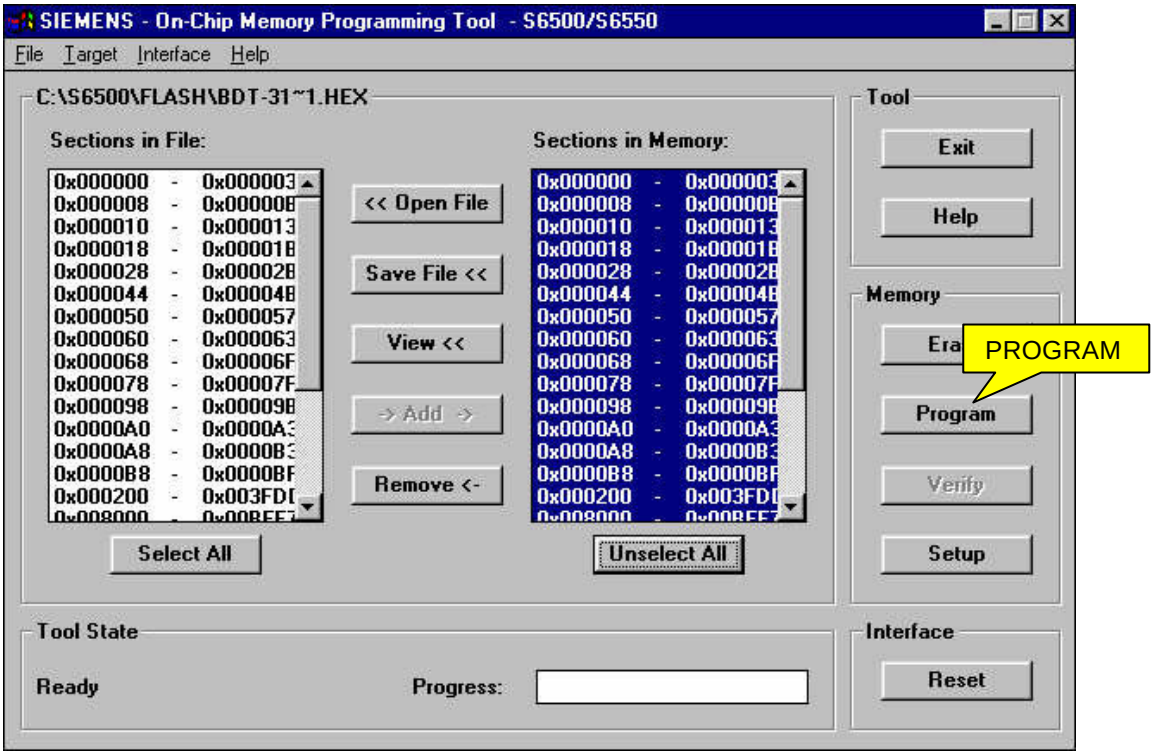

Figure 10. The 'Program' Screen

3.7 Resetting the Reader

Jumper 5 should now be removed. Pressing **RESET** will result in LED 5 (red) coming on briefly before LED 1 (green) and LED 2 (red) start flashing alternately. This signifies that a re-configuration of the memory has taken place. Pressing RESET for a second time will complete the re-initialization, with the single flashing green LED indicating the reader is ready for operation.

Note

Changing the Firmware will require any custom operating parameters to be re-configured, as they will have been returned to their default values

4 Using the 'S6 Reader Utility'

The 'S6 Reader Utility' can be downloaded from the RFID Systems website http://www.ti-rfid.com

Please ensure that you have the corresponding 'S6 Reader Utility' version installed for your Firmware version.

Using the S6 Utility you can communicate with and control the S6500/S6550 readers.

The S6_Utility allows the majority of the commands supported by the Tag-it HF and Tag-it HF-I inlays to be tested as part of software development. Further windows allow the system parameters of the S6500/S6550 reader to be modified and allow you to send Reader Control commands.

4.1 Establishing Communications

After the firmware change, check that the 'S6500' Reader Type is selected by the S6 Reader Utility.

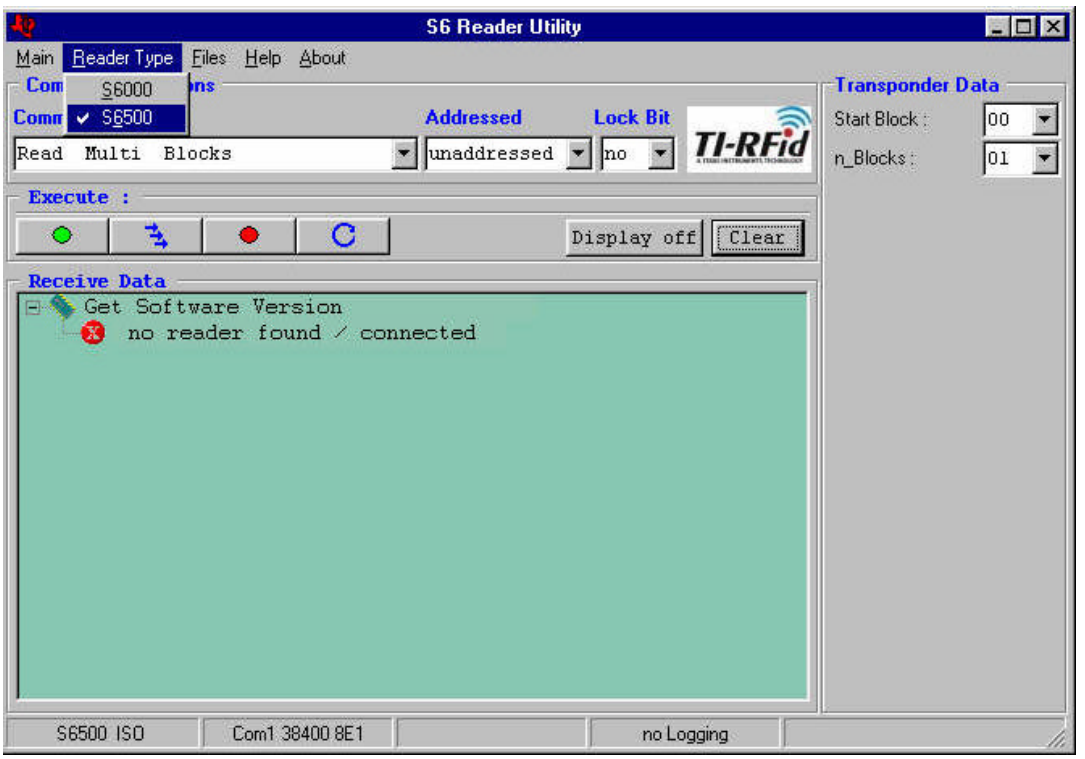

Figure 11. Checking the Reader Type

Figure 10 show that the S6500 reader type is selected. Now changing the Baudrate and protocol characteristics should enable communications to be re-established with the re-configured reader. These are changed through the '**Main**' - '**Com Port Options**' menu. The newly configured reader will have its defaults set to 38400 baudrate, 8 bits, EVEN parity and 1 stop bit.

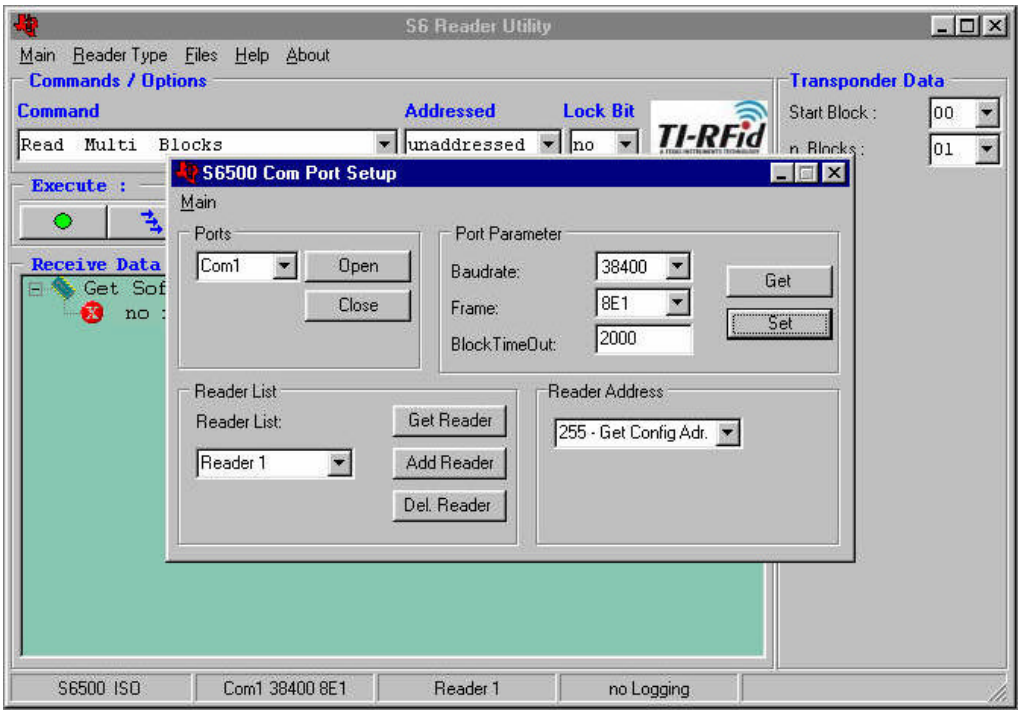

Figure 12. The Com Port Options

These parameters should be set as shown in Figure 11. Use the down arrow associated with the 'Ports' box to configure the correct Com port for your Host Computer.

If you now RESET the reader and exit the program, the changes you made will be stored and, if the Utility is started again, it should immediately connect and display the reader firmware version.

4.2 Changing the Operating Parameters

Once communications have been established with the reader, the '**Reader Setup**' option will be available on the '**Main**' menu.

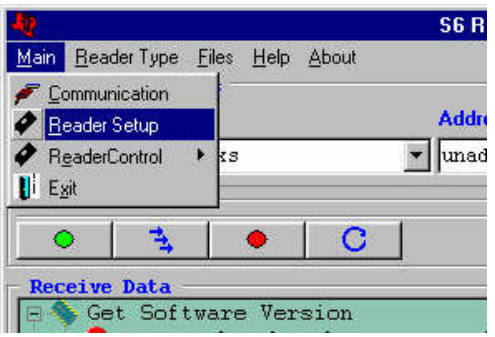

Figure 13. The Reader Setup Option

4.2.1 Reader Configuration Blocks

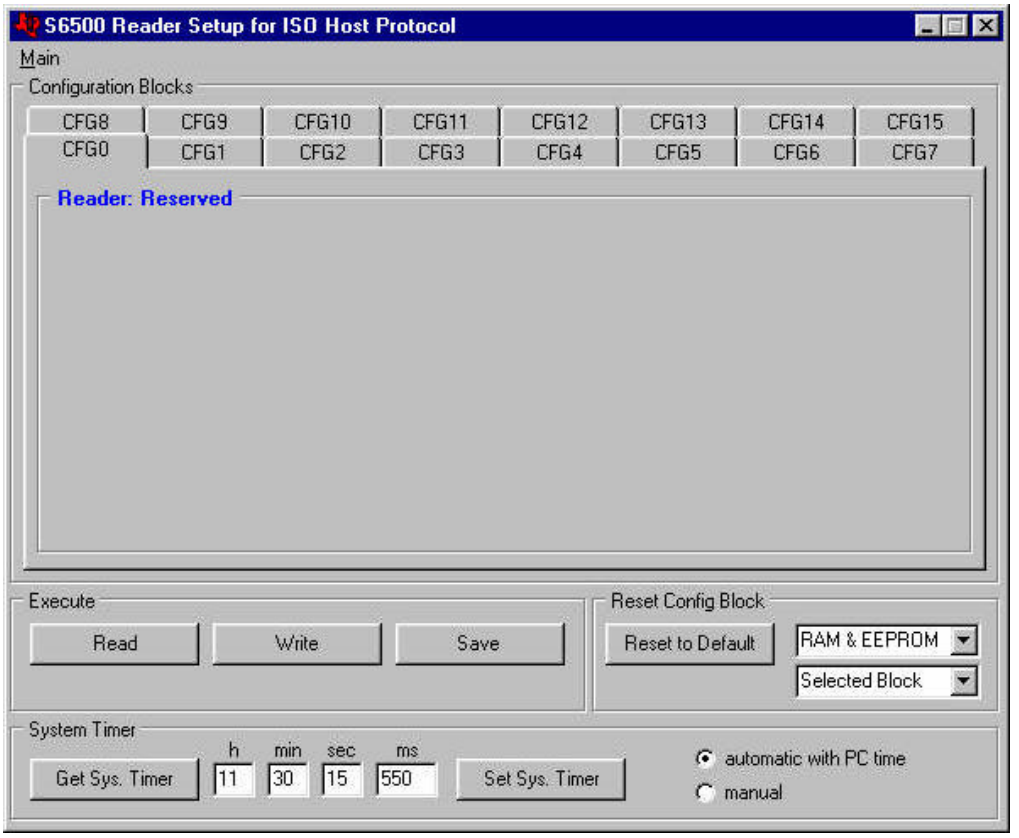

Figure 14. The Reader Configuration Blocks

In this screen you can select the individual 'Tab' for each of the 16 configuration blocks. Many of the blocks are reserved though and cannot be accessed.

The details of the parameters are given in the Host Protocol Manual and also described in the 'Help' files of 'S6 Utility' and are not duplicated here. As an example though, the next section will describe how to set the RF output power.

4.2.2 Changing the RF Output Power

The power is set in CFG 03 - RF Interface 1 as shown in Figure 14. It is always a good idea to '**Read**' the actual settings stored on the reader before making any changes and ensure that you '**Write**' and **'Save'** the changes before moving to the next block.

Information:

The configuration parameters are stored in both RAM and EEProm. 'Write' saves to RAM, whilst 'Save' writes to EEProm

After a **'Read'**, the default setting of 4 Watts should be displayed. If you wished to change the power to 2 Watts (8 x ¼ Watts), just type in the required number. A 'reasonableness check' will prevent you inputting a value 'out-of-range'

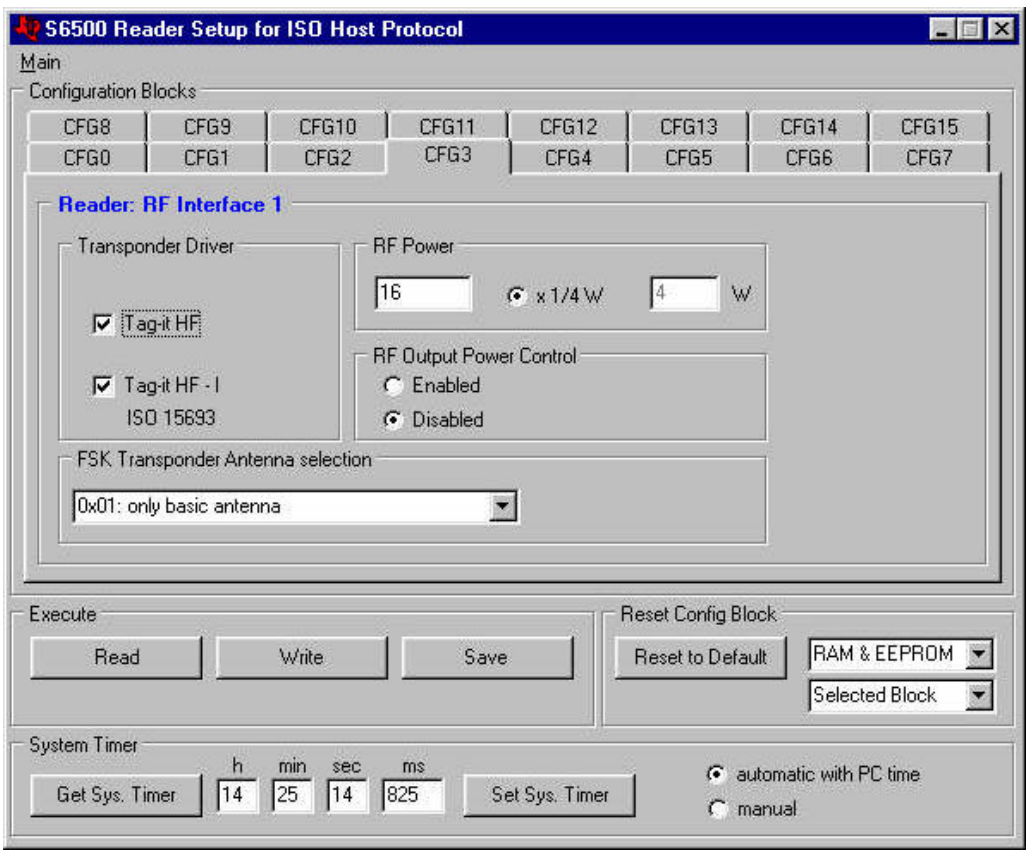

Figure 15. RF Interface 1

If the power adjustment is the only change, click on **'Write'** and '**Save'** , then RESET the reader. Many of the parameters (including Baudrate and RF Power) are only changed after a power-cycle or reader RESET.

5 Testing

On completion of any changes, integrators are advised to thoroughly test their application software.

CAUTION:

Integrators must ensure themselves that their Application Software operates correctly with the reader.