MARK IV INDUSTRIES CORP
I.V.H.S. DIVISION
6020 AMBLER DRIVE
MISSISSAUGA, ONTARIO
L4W 2P1
PHONE: (905) 624-3025
FAX: (905) 624-4572
ISO9001 Certificate No. 002002

USER GUIDE

FOR THE

T600 Tag Tester

DOCUMENT No. **A316000-852, Rev. E1**
Issued Date: January 19, 2009

Prepared By**:** Dan Terrier

Approved By: Terry Ho

©2002-2009 MARK IV INDUSTRIES CORP I.V.H.S. DIVISION
COPYRIGHT STATEMENT
Except as may be otherwise provided by contract these drawings and specifications contain proprietary information and are the property of MARK IV INDUSTRIES CORP, IVHS DIVISON and are issued in strict confidence and shall not be transmitted or reproduced or copied or used as the basis for the manufacture or sale of apparatus without prior written permission.

NOTICE:
The information presented in this document is current although it is subject to change. As such, MARK IV INDUSTRIES CORP IVHS DIVISION assumes no liability on behalf of the USER with respect to interpretation based on the use of this information.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

IMPORTANT!

NOTICE OF PATENTS:

MARK IV INDUSTRIES CORP I.V.H.S. DIVISION

has patented or has patents pending on critical design features of the item or items described herein. Contact the V.P. of Engineering at the address and phone number stated on the front page of this document for all queries regarding "patent infringement" or "manufacturing rights infringement".

FCC Notes

- This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
- The operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- The transmitter and antenna must not be co-located or operating in conjunction with any other antenna or transmitter. Failure to observe this warning could produce an RF exposure condition.
- This device has been designed to operate with the antenna unit included in the system. Use of any antenna device other than the one included is strictly prohibited.
- Changes or modifications not expressly approved by MARK IV INDUSTRIES CORP for compliance could void the user's authority to operate the equipment.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

Interference Troubleshooting

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by truning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

RELATED DOCUMENT NUMBERS:

TS 360420-810 Technical Specification - T600
PRO 360420-800 Product Requirement Outline - Tag Tester

MANUAL REVISIONS SUMMARY:

REV.	DATE	*TYPE	Section	DESCRIPTION and/or ECN REFERENCE
A	5-Sept-03	none	all	preliminary release issue
B	9-Oct-03	change	Appendix	
C	17-Nov-03	change	3.3, 6.5	add in keyboard wedge scanner
D	5-Dec-03	change	3.3	Scanner initialization
E	26-Jan-04	change	6.9	FPT G3 Identification
E1	11-Feb-09	change	 2 4.2	add FCC Warnings and Interference Trobleshooting changed unit photo add operating system add “calibration CD”

TYPE is either** ***none, add, change, clarify, delete.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

Photos of the System Components

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

Table of Contents

1. INTRODUCTION 7

2. PRE-INSTALLATION CHECK 7

3. HARDWARE INSTALLATION 8

3.1 HOST Connection 8

3.2 SCANNER Connection 8

3.3 Keyboard Wedge Barcode Scanner 8

3.4 Power 8

4. SOFTWARE INSTALLATION 9

4.1 Installing the PC Software 9

4.2 Installing the Calibration Files 9

5. FIRST TIME USAGE 10

5.1 Serial Port Configuration 10

5.2 TTU Serial Number Configuration 11

5.3 Log File Set-up 11

6. NORMAL TEST USAGE 12

6.1 User / Comment Field 12

6.2 Verify Tag Type 12

6.3 Testing a Tag 12

6.4 Test Response 13

6.5 Transponder ID Entry 14

6.6 Next Transponder 14

6.7 Tag Related Error Conditions 15

6.8 Sending Log Files to Mark IV 15

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

6.9 FPT G3 Identification 16

7. FUNCTIONAL CHECK PROCEDURE 17

APPENDIX A - SAMPLE TEST RESULT 18

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

1. Introduction

This guide provides instructions to install and setup the T600 Tag Tester to test MARK IV Flat Pack Transponders (FPT).

2. Pre-Installation Check

Important Note:
In order to avoid interference between tag testers and tag programmer, equipment installation shall consider the following:

1. Minimum 10 ft apart between 2 T600 Tag Testers.
2. Minimum 3 ft apart between Tag Tester (T600) and any Tag Programmer (T500).
3. Minimum1ft apart from unwanted tag (tag not tested) to T600.

Please verify that the following items have been provided in the package.
If any items are missing, contact Mark IV Service at (732)-494-7720.

- T600 Tag Tester Unit (TTU)
- External power supply (Model 002521547)
- 2 serial cables
- Installation media
- Calibration floppy or CD
- Optional: keyboard wedge barcode scanner and cable (Symbol, LS1902T-I000-3000S)

You must supply a standard PC with the following:

- PS-2 port keyboard.
- Windows 9x, Windows 2000, XP or Vista
- 2 free RS-232 serial ports (DB 9 pin)

Note:
- If the keyboard is DIN connector type, you need 2 adapters: one PS-2(male)-to-DIN(female) and one PS-2(female)-to-DIN(male).
- If the keyboard is USB connector type, you need 2 adapters: one PS-2(male)-to-USB(female) and one PS-2(female)-to-USB(male).

The following installation sequence is recommended:

- hardware installation,
- software installation,
- first-time usage

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

3. Hardware Installation

3.1 HOST Connection

Connect one end of one of the provided serial cables (both are identical) to the connector labeled “HOST” at the back of the T600 Tag Tester. Connect the other end to COM1 of the PC (or another free serial port).

3.2 SCANNER Connection

Connect one end of 2nd serial cable (both are identical) to the connector labeled “SCANNER” at the back of the T600 Tag Tester. Connect the other end to COM2 of the PC (or another free serial port).

3.3 Keyboard Wedge Barcode Scanner

Disconnect the keyboard from the PC connector and connect the keyboard wedge scanner to it. Reconnect the keyboard to one end of the keyboard wedge cable.

Initialization:
For the Keyboard Wedge Barcode Scanner to function properly, it requires to scan both barcode labels: *Set Defaults* and *Keyboard Wedge Host Type,* in page 42 of the Scanner Guide.

3.4 Power

Connect one end of the external power supply to the AC outlet. Connect the other end to the back of the T600 Tag Tester.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

4. Software Installation

Note the PC requirements listed in the “Pre-Installation Check” section.

4.1 Installing the PC Software

You should have received installation media with the T600 PC software.

Create a directory called “T600 tag tester” on your hard drive, and copy the contents of the installation media into this directory.

4.2 Installing the Calibration Files

You should have received a “calibration floppy” or “calibration CD” for each T600 Tag Tester. This floppy or CD contains important calibration data specific to an individual tag tester.

Copy the contents of the calibration floppy or CD (*.CAL files) into the directory in which you installed the T600 PC software.

Note that it is possible to have calibration files for multiple tag testers in the same directory at the same time. The T600 Tag Tester software will use the one that matches the serial number as specified in the configuration dialog.

Note: Only a MARK IV technician can calibrate the T600.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

5. First Time Usage

Power up the T600 Tag Tester. The front panel red light should be on for a few seconds then turn off.

Video settings: The recommended display adapter resolution is 1024 by 768.

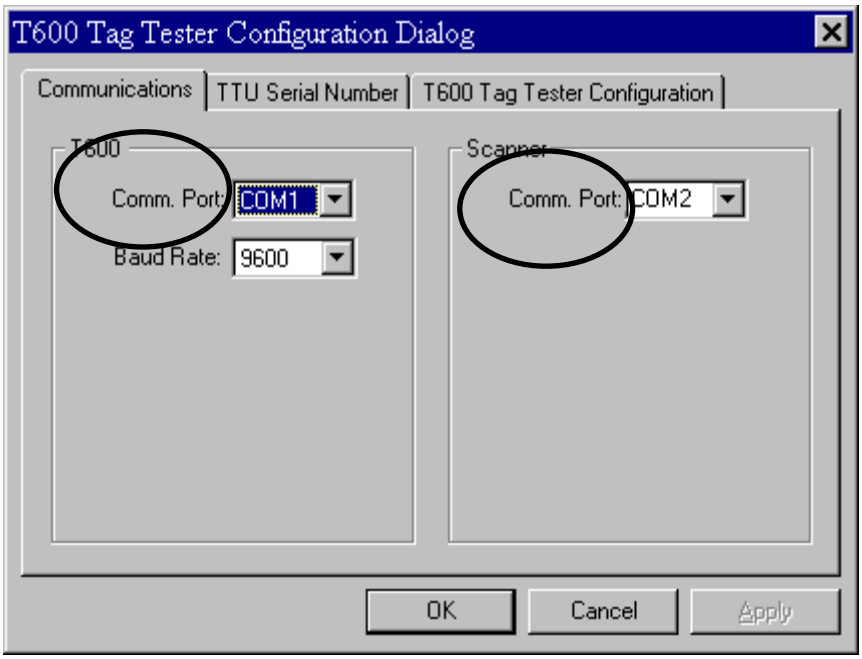
Start the T600 PC application by clicking on the executable filename or icon. (You may want to create a shortcut on the desktop).

5.1 Serial Port Configuration

From the menu bar, select Settings | Configuration.

On the left side of the window (“T600”), select the proper PC COM port where the “HOST” cable has been connected. Do not change the baud rate.

On the right side of the window (“Scanner”), select the COM port where the “SCANNER” cable has been connected.

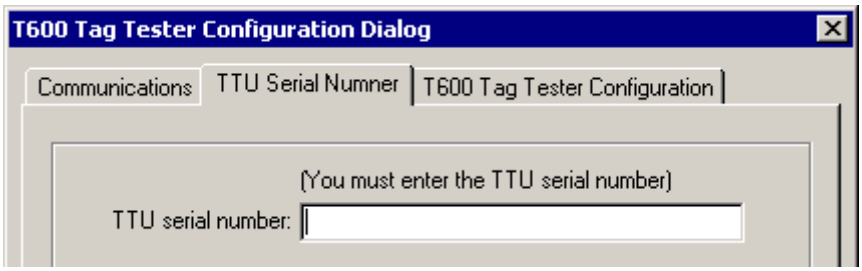


© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

5.2 TTU Serial Number Configuration

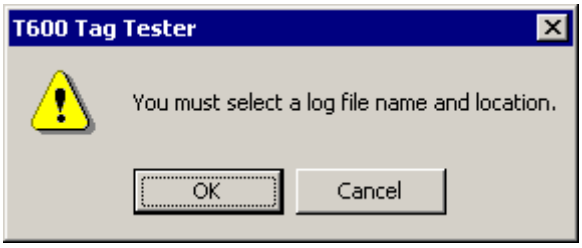
From the menu bar, select Settings | Configuration. Click on the “TTU Serial number” tab.

Find the physical label with the serial number on the T600 Tag Tester unit (TTU) and enter it on screen.

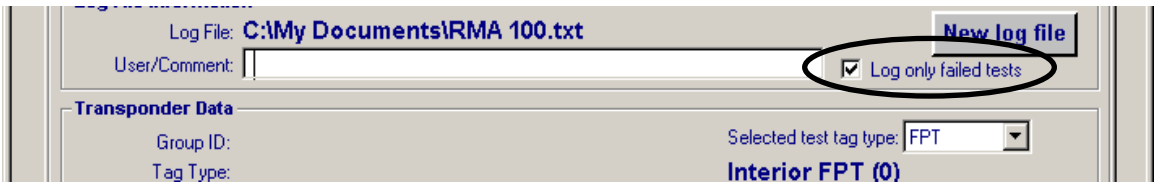


5.3 Log File Set-up

The first time the software is used (on a specific machine), a pop-up will appear indicating that a log file name and location must be specified.



Unless a new log file is specified, any new results are added to the last log file specified. The T600 Tag Tester saves the name and location of the log file. The current name and location of the log file is shown at all times.



NOTE: **By default, only tests that fail are stored in the log file**. This is the recommended setting to minimize the size of log files. To change this to log all test results, uncheck the box labeled “Log only failed tests”.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

6. Normal Test Usage

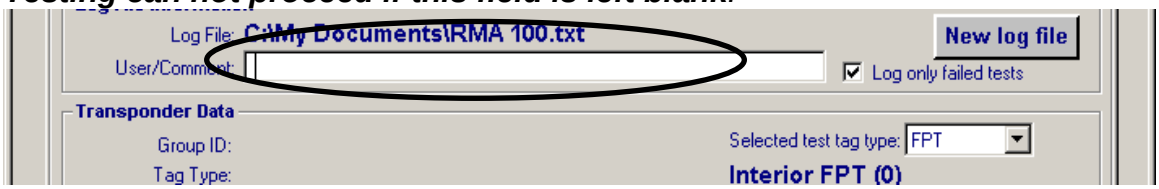
Follow this sequence:

1. Power up the T600 box.
2. Start the T600 application.

6.1 User / Comment Field

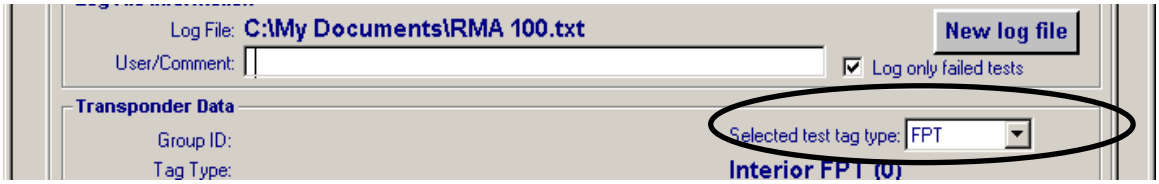
A user / comment box is provided. It is recommended that the supervisor at a customer service center require operators to specify their user ID in this field. This field will appear in each record of the log file.

Testing can not proceed if this field is left blank.



6.2 Verify Tag Type

Verify that you are testing an interior FPT. No other tag types can be selected.

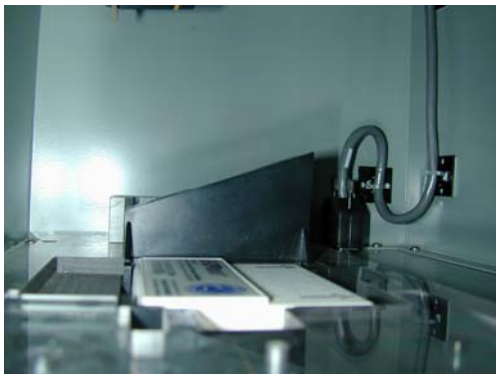


6.3 Testing a Tag

Step (1)
Place tag in cradle inside T600 Tag Tester unit.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

Step (2)
Remove your hand **Completely** from the opening of the T600 Tag Tester.



Correct

Incorrect

Step (3)
Press the “Test Start” button at the top of the window to start the test or use keyboard short cut <CTRL>A.

Do not move the transponder while the “Test in progress” message is displayed on the screen or the red “Test in Progress” light on the front panel of T600 Tag Tester is active. If a tag is removed during testing, the test will be aborted.

6.4 Test Response

Within a few seconds, a large “Tag PASS” (in green) or “Tag FAIL“ (in red) message is displayed. Refer to the Appendix A for sample screen shots.

A new record will be added to the log file. (If the “Log only failed tests” checkbox is checked, only failed results are logged).

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

Remove the transponder from the T600 Tag Tester.

6.5 Transponder ID Entry

If the bar code label on the tag cannot be read by the internal bar code scanner, the T600 Tag Tester will prompt the operator to key in the transponder data manually. The tester will accept input from a keyboard wedge scanner.

Please ensure that the "Caps Lock" keyboard state is not enabled, as this could cause bar code reading problems with the keyboard scanner. Most keyboards have a Caps Lock indicator light. If it is on, press the "Caps Lock" key again to turn it off

6.6 Next Transponder

If “Tag PASS” is shown, the next transponder can be tested.

If “Tag FAIL” is shown, once the label information has been entered, the next transponder can be tested.

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

6.7 Tag Related Error Conditions

Message	Description
No response from tag.	Read attenuation decreased to 0 dB and there was no response from the tag (i.e. number of read timeouts = read sample size).
Bad CRC transponder	*If number of good reads = 0, and 50% or more of samples are bad CRC*
Good CRC but Group ID not 65	Invalid data contents
Bar code mismatch with tag contents	*Serial number or agency ID mismatch with bar code information (scanned).*
Read margin exceeds limits	Read Margin is outside allowed range.
Write margin exceeds limits	Write margin is outside allowed range.
Read performance below limit	Problems reading data from transponder.
Write performance below limit	Problems writing data to transponder.

6.8 Sending Log Files to Mark IV

The log file generated by the T600 Tag Tester contains important information about the tags tested.

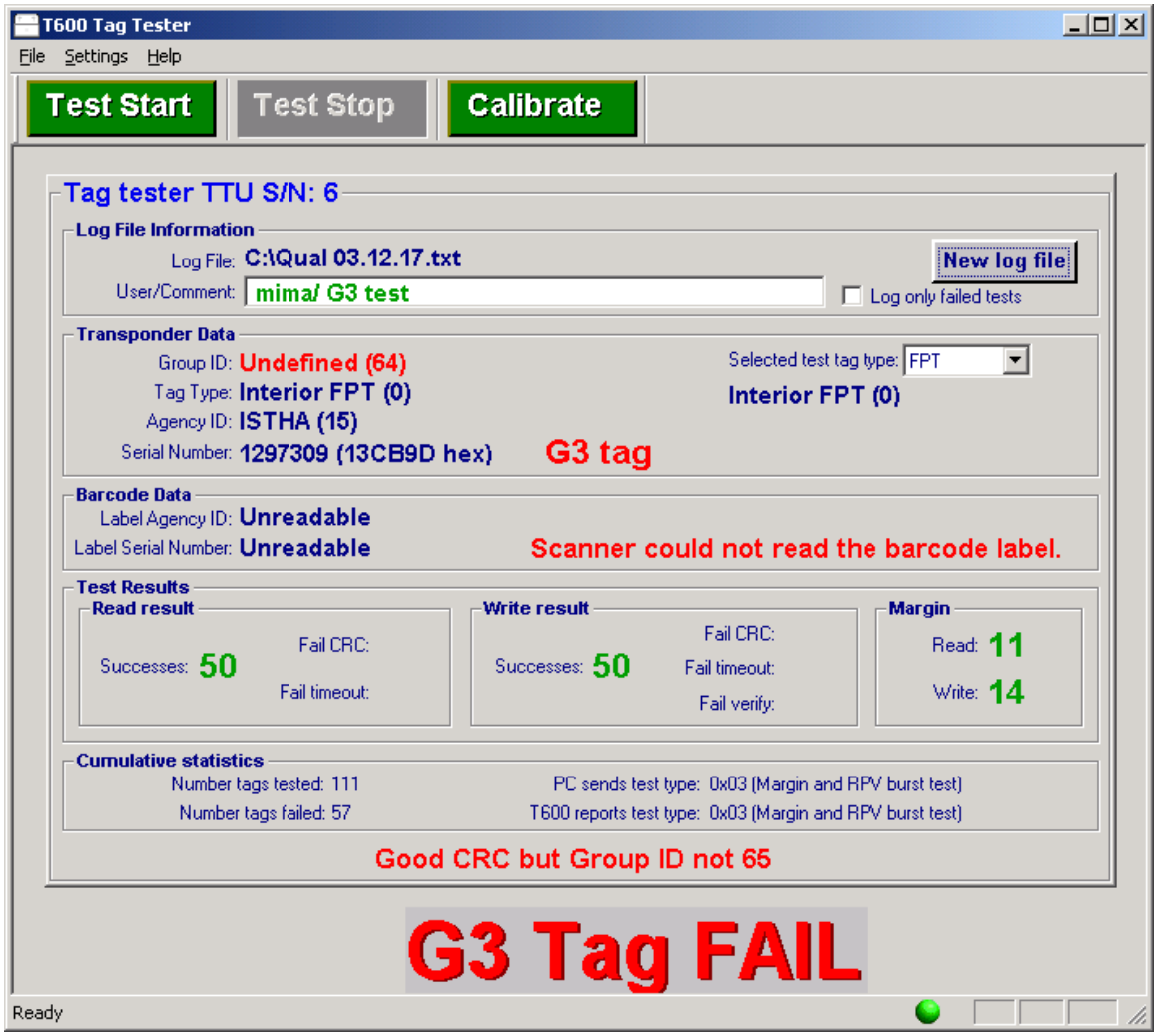
The following minimum procedure is required in terms of the T600 Tag Tester log file:

- Obtain a RMA number from Mark IV.
- Rename the log file to include the RMA number.
- Transmit the log file (**in its original format)** electronically to Mark IV (e-mail, floppy, or CD).

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

6.9 FPT G3 Identification

If a G3 tag is tested and fails “G3 Tag FAIL” is displayed as shown below. This feature will provide the T600 with capability of identifying the G3 tag from other FPT tags. The log file generated by the T600 Tag Tester, as discussed in section 6.8, will also contain a separate column for G3 tag identification.



© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

7. Functional Check Procedure

After 100 consecutive no-response test failures, the software will automatically display the following error message.

Follow the instructions, and if you continue to see this message after testing 3 known good tags, perform the following

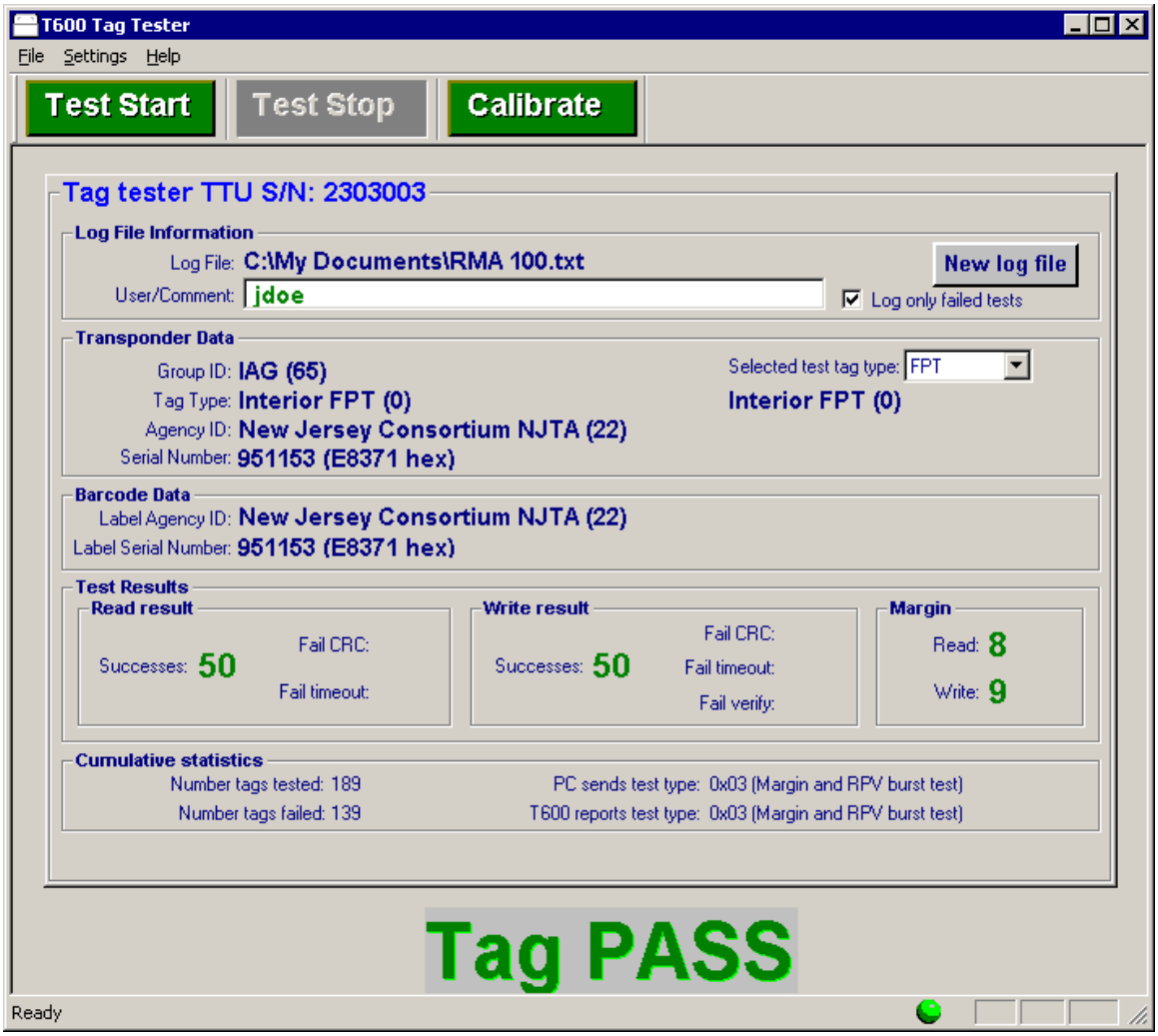
1. **Contact MARK IV service.**

2. **Stop using the T600 TagTester.**

© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

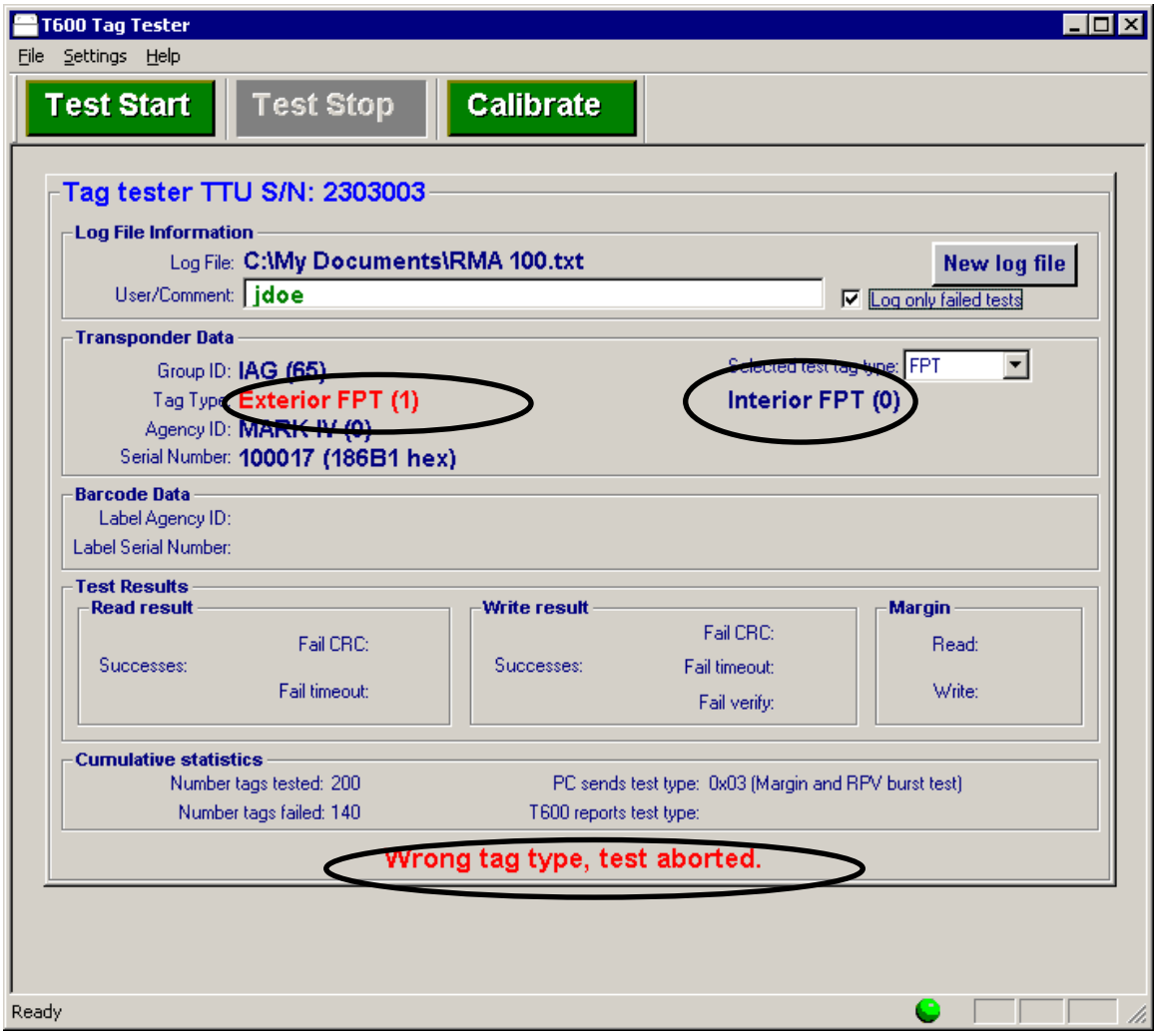
Appendix A - Sample Test Result

1. Sample FPT test result:



© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.

2. Sample error message when the tag type selected is different than the tag type under test:



© 2009 MARK IV INDUSTRIES LTD.
EXCEPT AS MAY BE OTHERWISE PROVIDED BY CONTRACT, THESE DRAWINGS AND SPECIFICATIONS CONTAIN PROPRIETARY INFORMATION AND ARE THE PROPERTY OF MARK IV INDUSTRIES LTD. AND ARE ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE TRANSMITTED OR REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT WRITTEN PERMISSION.