Future Technology Devices International Ltd.

Application Note AN_128

User Guide For FT4232H Factory Test Utility

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This application note explains how to use the FT4232H factory test utility, FT4232_UART, which provides a user interface to program and test FTDI FT4232H devices.

Table of Contents

1   Introduction

The FT4232_UART program is intended for use in an FT4232H manufacturing test environment. It has a single button user interface and returns a simple pass or fail for USB - RS232 designs. The executable version is hard-coded for use with the default VID and PID. The FT4232H default VID/PID is 0403/6011. The source code for this program is provided on the FTDI website at the C# Builder examples page and can be built by VC# 2008. The test program also requires a special cable to operate correctly.

The features of FT4232_UART are:

1. Auto-detect FT4232H.

2. Support two testing methods: normal test (uses a RS232 Null cable) and special test (uses a special cable),check RI/DCD Pins

3. Selection test only or programming and testing.

4. Repeat test feature.

5. Support the test Port A and Port B or Test Port C and Port D

The FT4232_UART is available as a free download from the Utilities page of the FTDI website.

2 Hardware Configuration

EEPROM Configuration:

The FT4232H device requires an external 93C46 EEPROMs organized in 16-bit words. It also supports the 93C56 and 93C66 EEPROMs organized in 16-bit words.
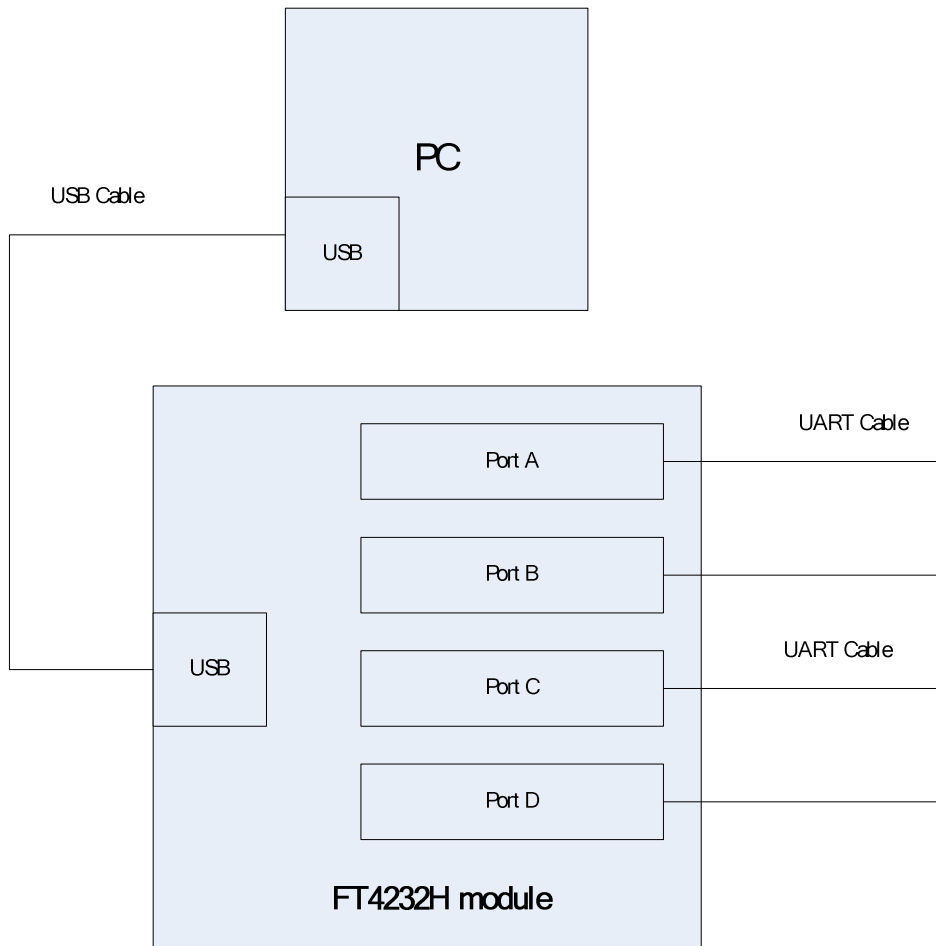
CABLE Configuration:

This utility supports two testing methods. Both require a cable to be manufactured. Users require to select one test method and manufacturing the appropriate cable. The following details the DB9 female connections for this cable:

1. Normal testing cable (RS232 Null cable):

    DB9 female_1 Pin 3 (TXD) to DB9 female_2 Pin 2 (RXD)

    DB9 female_1 Pin 2 (RXD) to DB9 female_2 Pin 3 (TXD)

    DB9 female_1 Pin 7 (RTS) to DB9 female_2 Pin 8 (CTS)

    DB9 female_1 Pin 8 (CTS) to DB9 female_2 Pin 7 (RTS)

    DB9 female_1 Pin 6 (DSR) to DB9 female_2 Pin 4 (DTR)

    DB9 female_1 Pin 5 (GND) to DB9 female_2 Pin 5 (GND)

    DB9 female_1 Pin 4 (DTR) to DB9 female_2 Pin 6 (DSR)

2. Special testing cable:

    DB9 female_1 Pin 3 (TXD) to DB9 female_2 Pin 2 (RXD)

    DB9 female_1 Pin 2 (RXD) to DB9 female_2 Pin 3 (TXD)

    DB9 female_1 Pin 7 (RTS) to DB9 female_2 Pin 8 (CTS)

    DB9 female_1 Pin 8 (CTS) to DB9 female_2 Pin 7 (RTS)

    DB9 female_1 Pin 6 (DSR) to DB9 female_2 Pin 4 (DTR)

    DB9 female_1 Pin 5 (GND) to DB9 female_2 Pin 5 (GND)

    DB9 female_1 Pin 4 (DTR) to DB9 female_2 Pin 6 (DSR)

    DB9 female_1 Pin 1(DCD) short to DB9 female_1 Pin 6(DSR) and Pin 9 (RI)

    DB9 female_2 Pin 1(DCD) short to DB9 female_2 Pin 6(DSR) and Pin 9 (RI)

Device connection configuration:

Use a USB cable to connect the FTDI device to a PC. Then prepare the RS232 null cable or special cable for COM port test. For simple COM Port testing, connect port A to port B and port C to port D. This connection is shown in the following diagram

Figure 2-1 Connection configuration of Device Under Test

3   Utility Basics

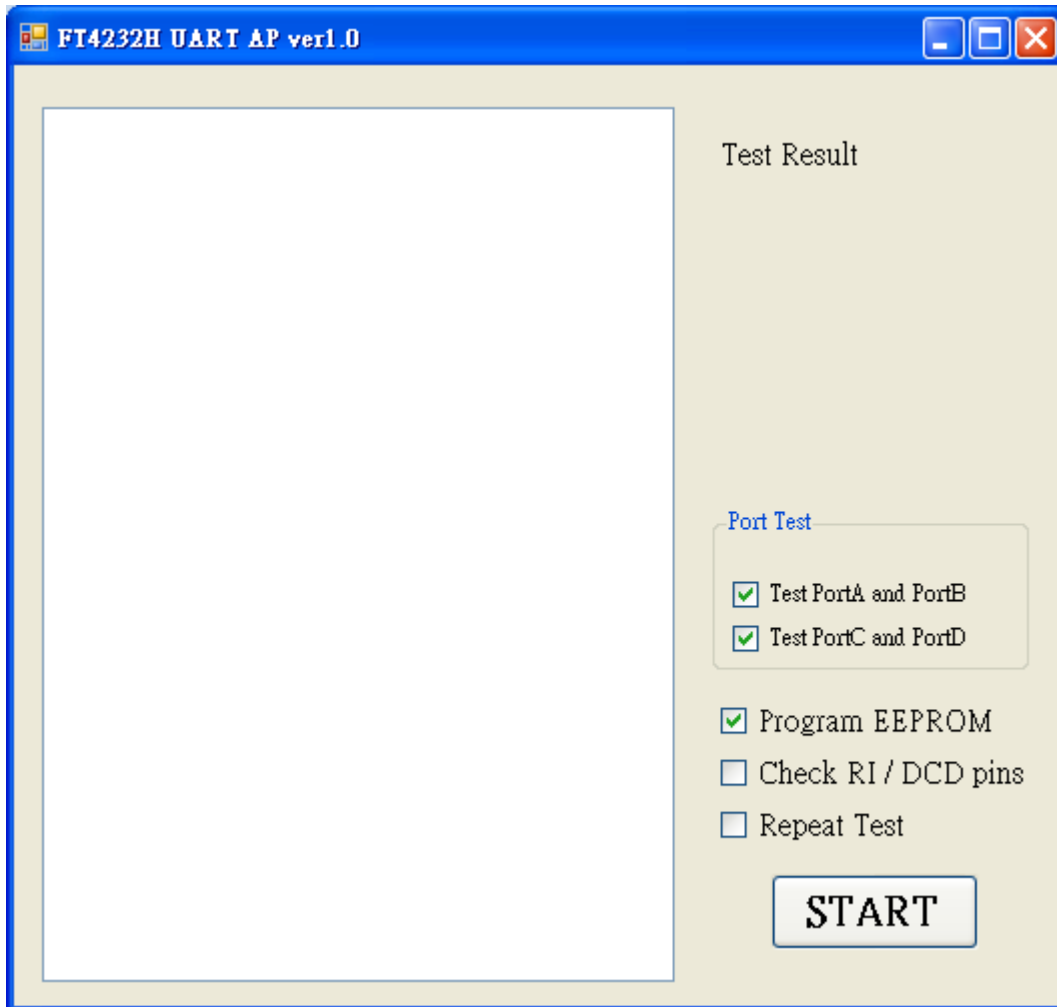When the FT4232_UART utility is run then the following screen appears:

Figure 3-1 FT4232 Default GUI

The following sections explain how to use the GUI shown above.

3.1 Operation

The FT4232_UART has four functions:

Program EEPROM: users can enable or disable the program EEPROM function.

The following table describes the functions of this option:

Program EEPROM Test	Description of operation
Selected(default)	Update Default data to EEPROM
not selected	No update EEPROM

Table 3.1 EEPROM Data Selection switch
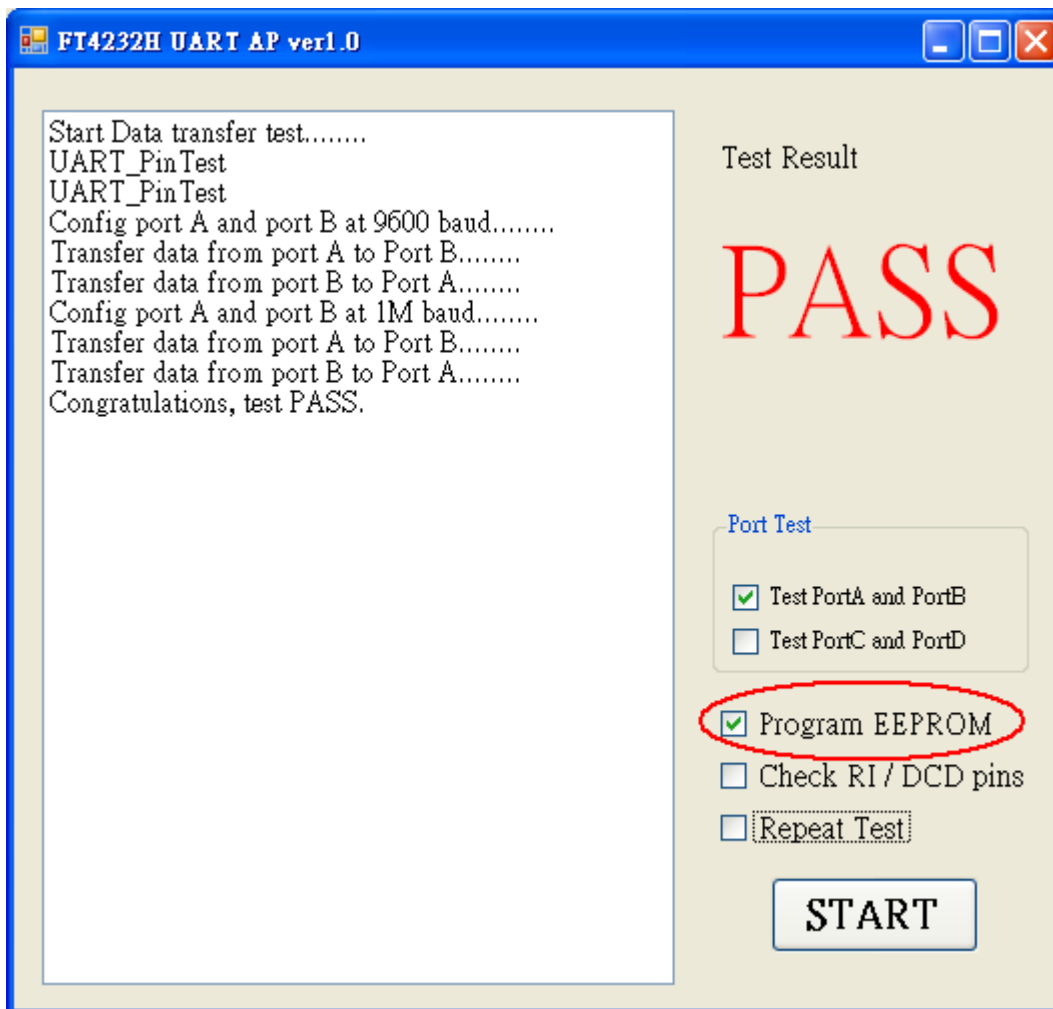
Figure 3-2 enable Program EEPROM

If "Program EEPROM" is not selected, then the RS232 function only is tested.

Check RI/DCD pins:

The default is that this is disabled. This means the utility is set to normal test mode. If enabled then this function puts the utility into a special test mode. This special test mode is a full test of all signals.

This function can be enabled/disabled using the "Check RI/DCD Pins" to change the testing methods.

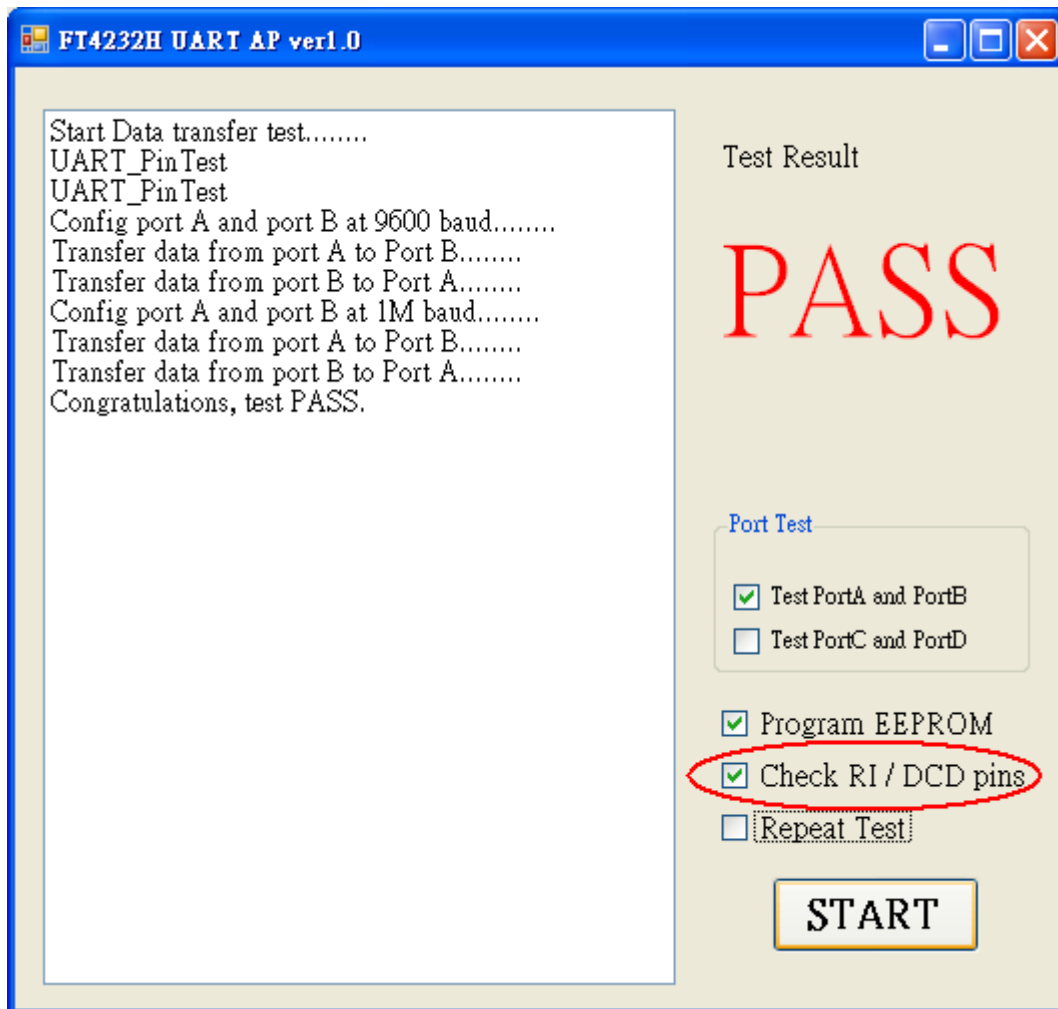| Check RI/DCD Pins	Description
not selected(default)	It means utility set on normal mode. Please using RS232 null cable that is defined the "Check RI/DCD pins" in disable for testing
selected	It means utility set on special test mode. Please using special cable that is defined the "Check RI/DCD pins" in enable for testing

Table 3.2 Test Method Selection switch

Figure 3-3 enable Check RI/DCD Pins

Repeat Test: if this function is enabled and "START" is pressed, then the utility will repeat the COM port data commutation testing. If this is not required then disable the "Repeat test" function.
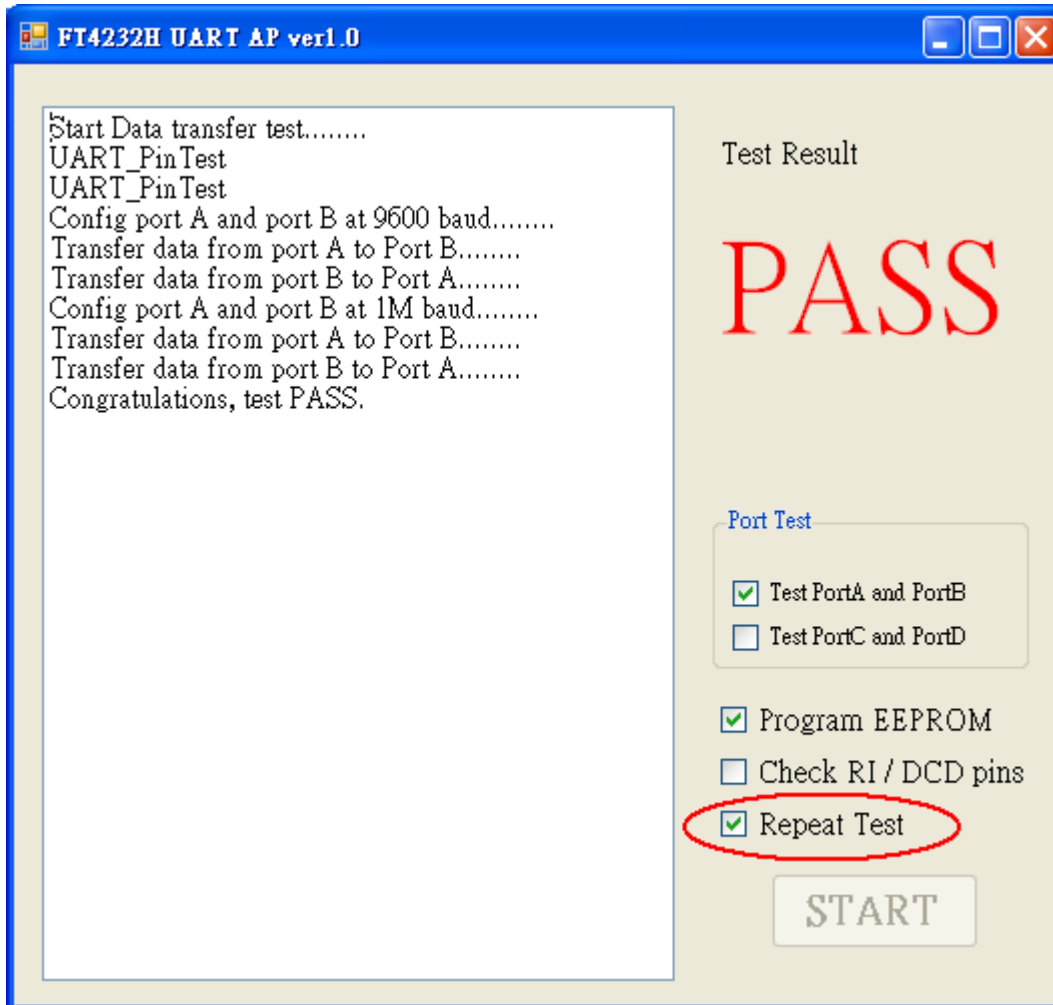

Figure 3-4 Enable Repeat test function

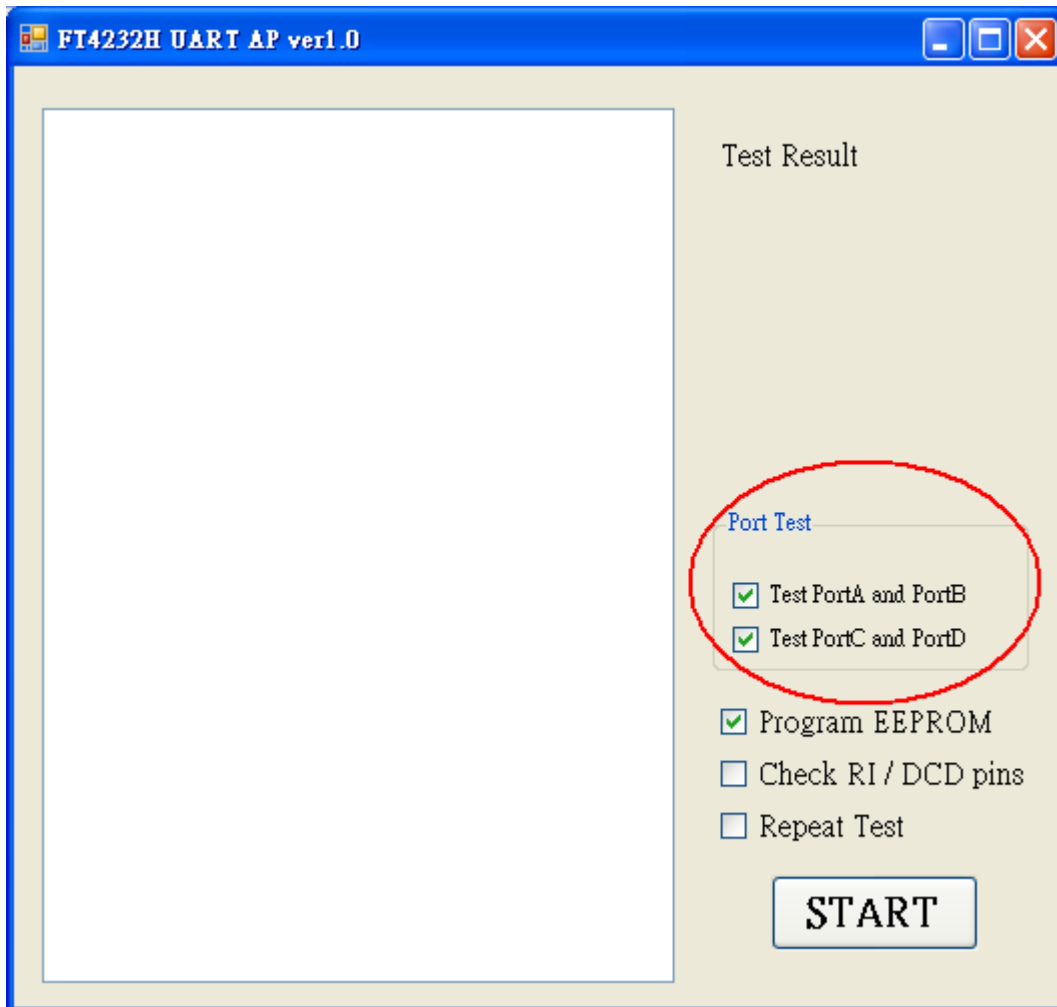**Port test selection:** This option allows selection of which port to test.

Figure 3-5 Port Test selection

4   Device EEPROM Parameters

The source code for this program is provided on the FTDI website at the C# Builder examples page and can be built by VC# 2008.

The subroutine WriteEEPROM() is available in file "Form1.cs". Its function is used to program the device external EEPROM.

The following sections explain which parameter can be modified using the file "Form1.cs".

4.1 Default EEPROM data

The default settings are as below:

// the EEPROM parameters below can be modified in the file "Form1.cs".

    ee4232h.Description = "FT4232H Device";

    ee4232h.Manufacturer = "FTDI";

    ee4232h.ManufacturerID = "FT";

    ee4232h.VendorID = 0x0403;

    ee4232h.ProductID = 0x6011;

    ee4232h.RemoteWakeup = false;

    ee4232h.SelfPowered = false;

    ee4232h.SerialNumber = "FT" + GenSerialNo();//the default serial number is general by current

time

5   Definition of Error Messages

The following section shows some error messages which may be displayed if issues occur. It also

indicates possible reasons for the failure to help with factory debugging.

- If the PC cannot detect an FT4232H device, please check the device is connected to a PC and the
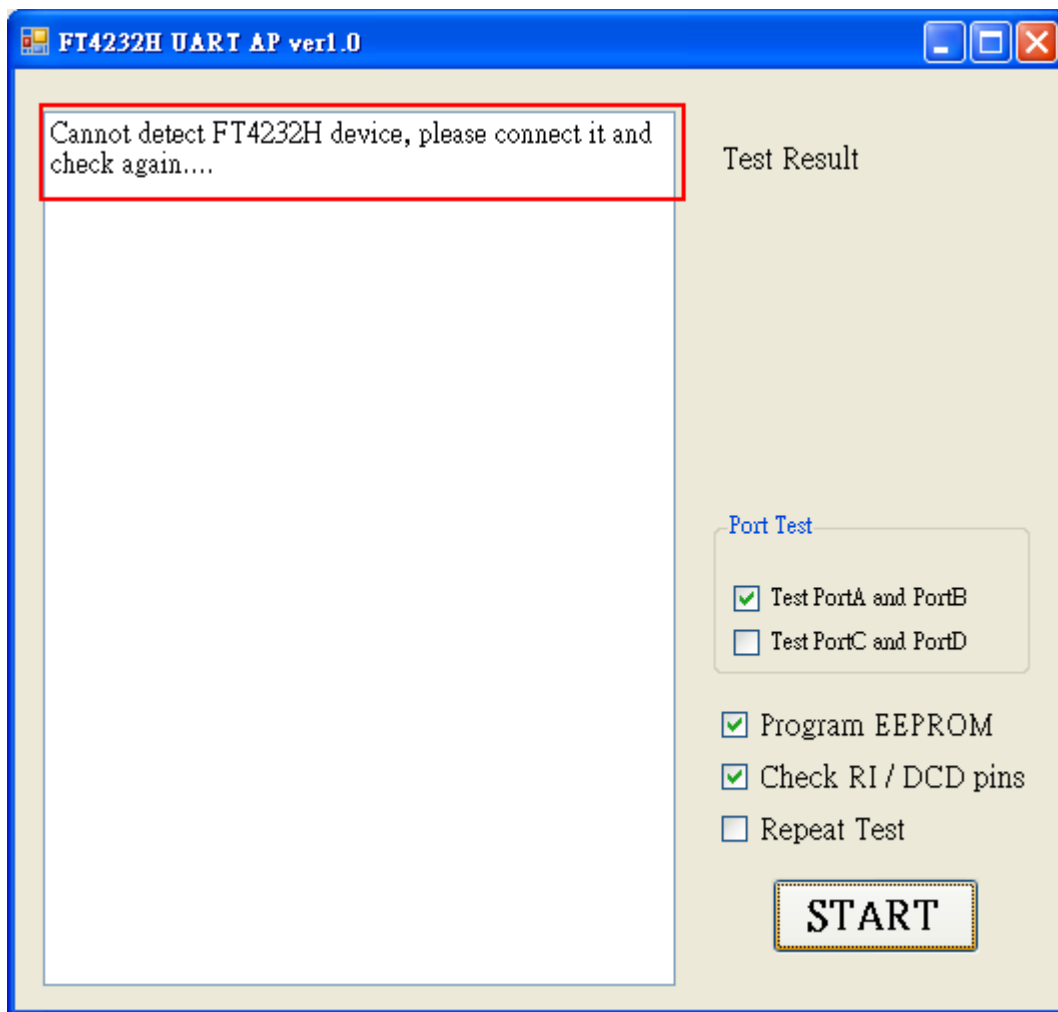
  FTDI Driver has been installed.

Figure 5-1 Failure message 1

- If the following message appears, then connect the device to a PC and wait the device to initialize, and press the "START" again.
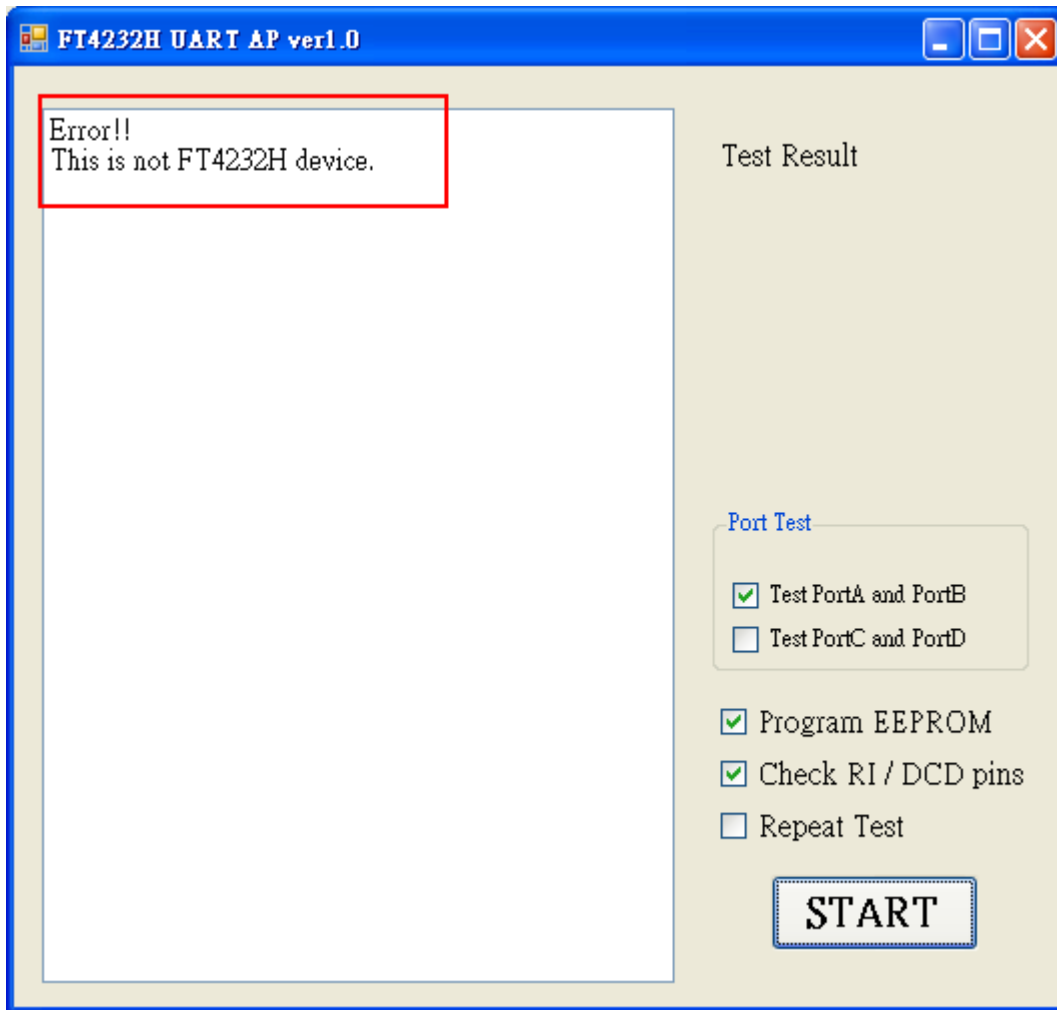
Figure 5-2 Failure massage 2

- If the following message appears then check that the Null cable is connected correctly or check that the DSR signal schematic design under test.
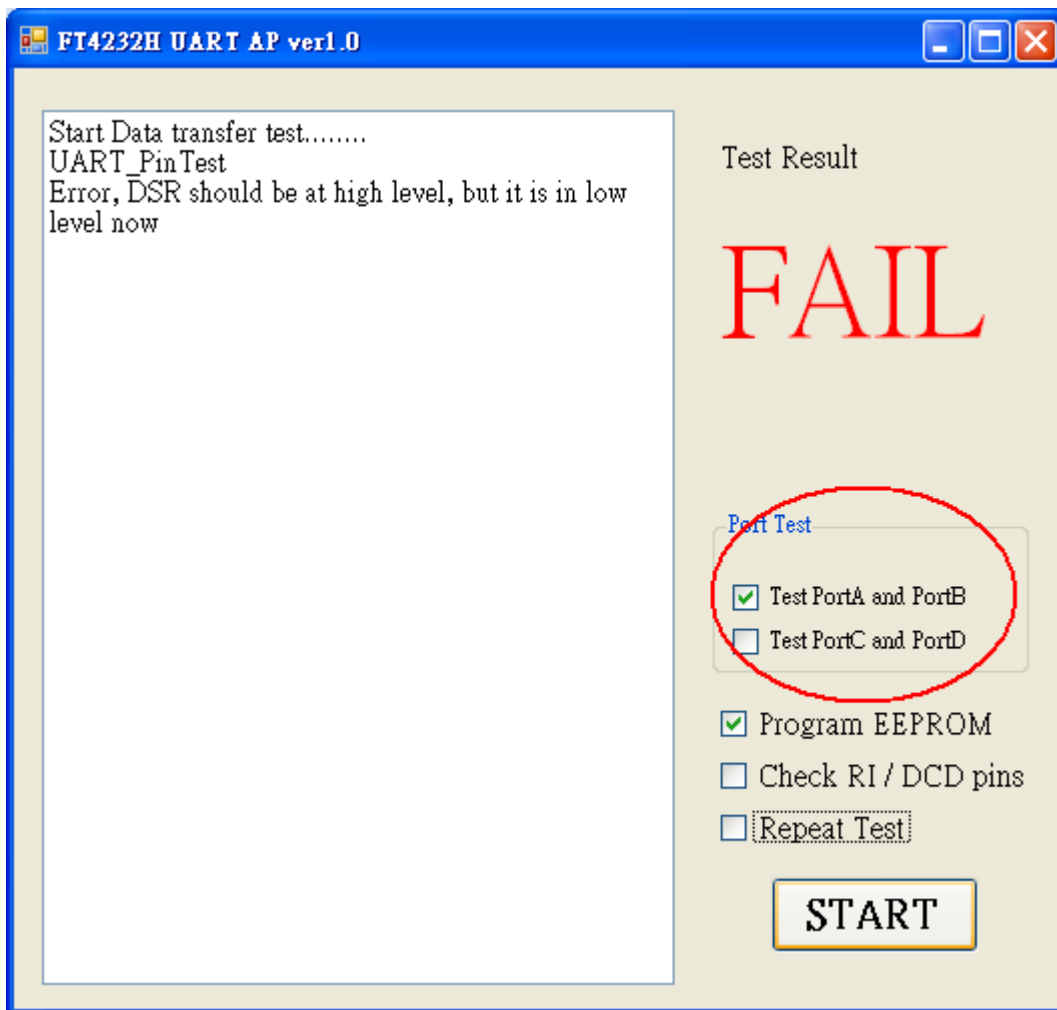

Figure 5-3 Failure message 3

● If the following message appears then check that the special cable is connected correctly or check the RI signal of the schematic design under test.
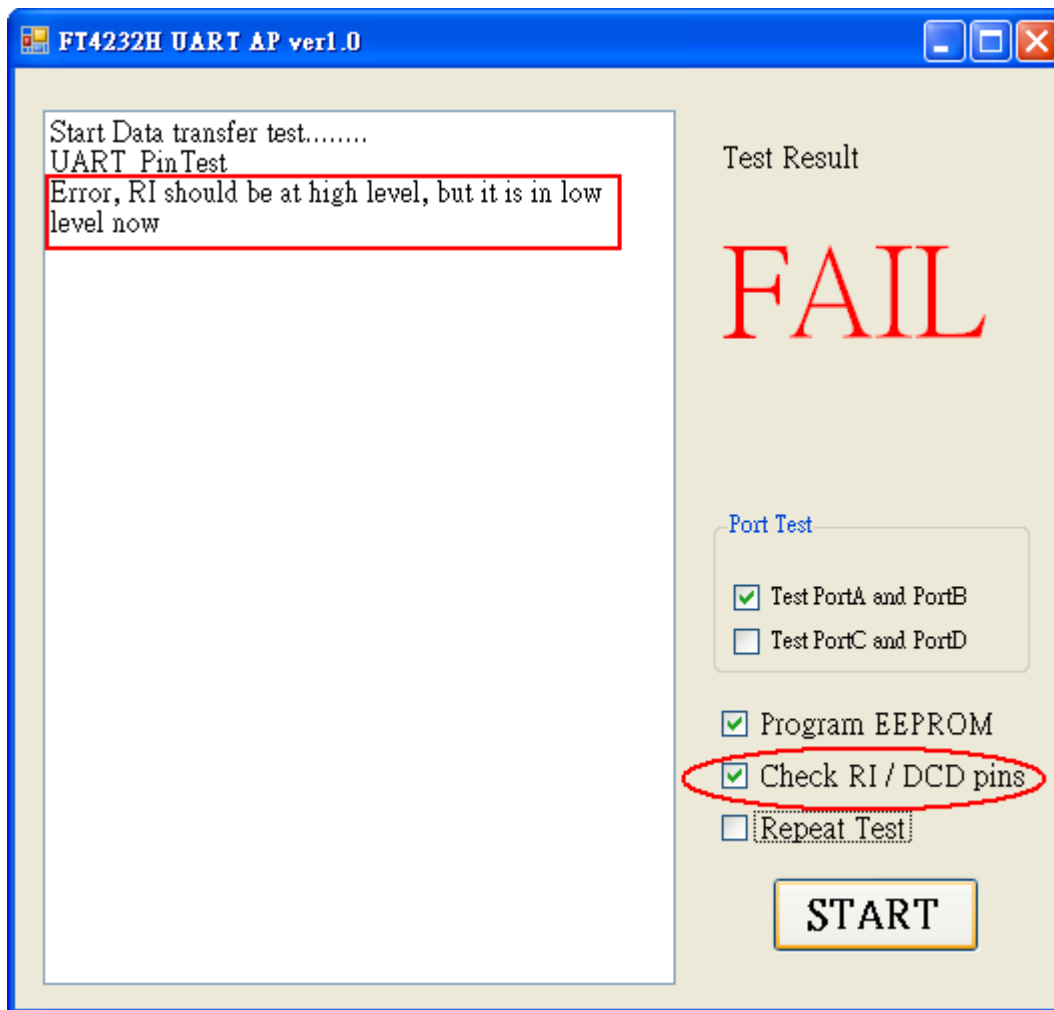

Figure 5-4 Failure message 4

● If the following message appears then check that the special cable is connected correctly or check the DCD signal of the schematic design under test.
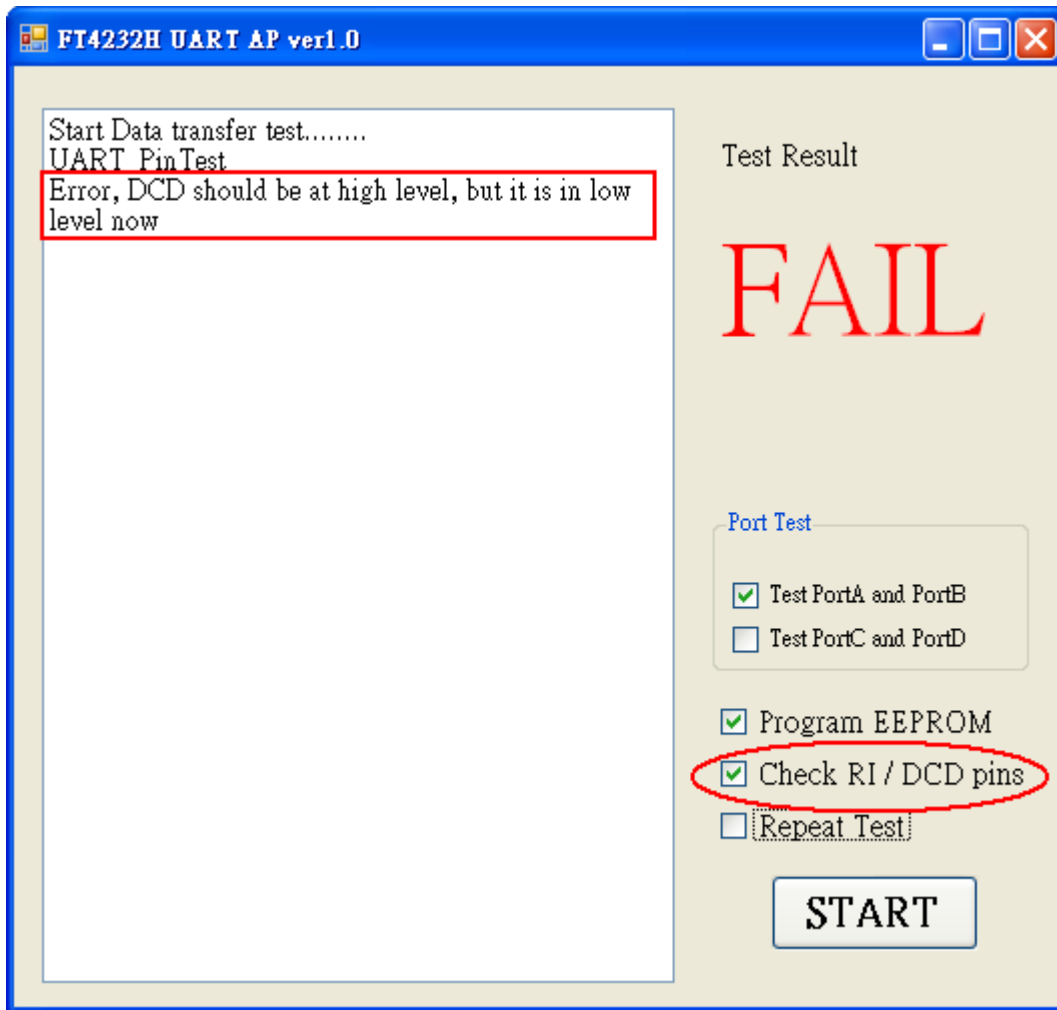

Figure 5-5 Failure message 5

● If the following message appears then go to http://msdn.microsoft.com/en-us/netframework/default.aspx   to download the .NET Framework and install it.
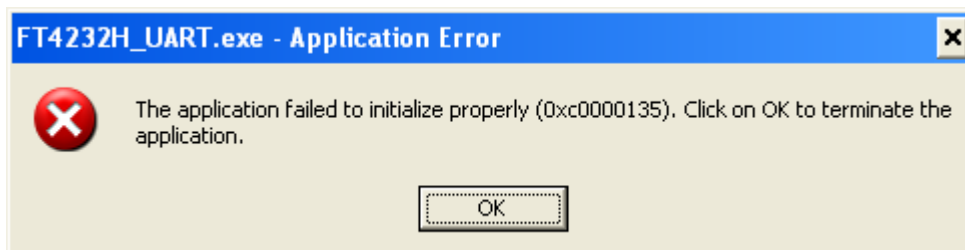
Figure 5-6 Failure message 6

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Distributor and Sales Representatives

Please visit the Sales Network page of the FTDI Web site for the contact details of our distributor(s) and sales representative(s) in your country.

Appendix A - Revision History

Revision History

Version 1.0   First Release   20/10/2009