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ACT-IR3200M & ACT-IR3200SW FIR/MIR/SIR Tester

User's Manual



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Version 1.1

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REVISION HISTORY

Revision History		
Revision	Date	Comment
Rev 0.1	01/20/2005	Preliminary Design Specification for Internal Review
Version 1.0	02/01/2005	Version 1.0 Released
Version 1.1	04/01/2005	Modification in GUI

ACTiSYS reserves the right to make changes without further notice to any products herein to improve reliability, function or design. ACTiSYS does not assume any liability arising out of the application or use of any product or circuit described herein

1) INSTALLATION FOR ACT-IR3200SW SOFTWARE

Following is the installation instruction for ACTiSYS-IR3200SW under Windows 2000

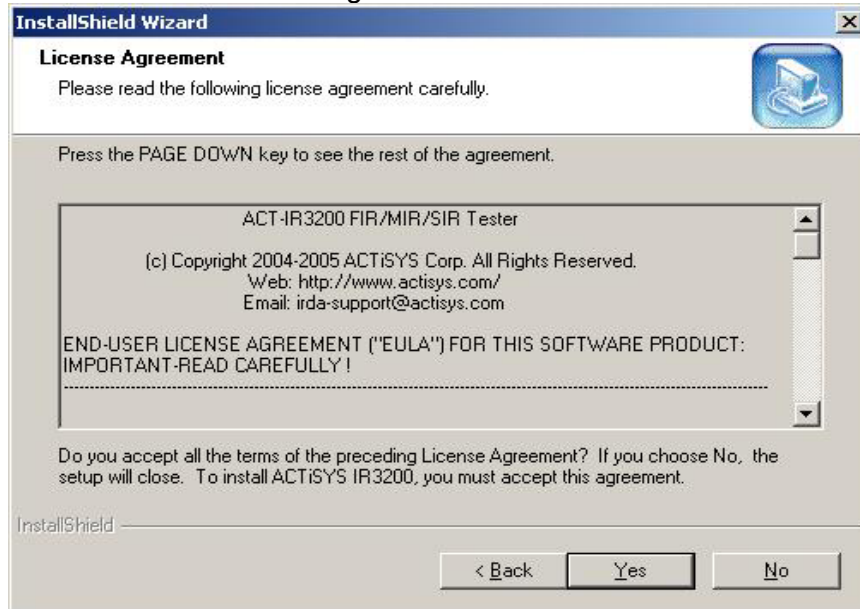
Note: This program supports Windows 98/Me/2000/XP. If previous version of the software is already installed in the target machine, please uninstall before proceeding.

1. Click on ACT-IR3200SWSetup-v1.1-050401.exe to execute setup wizard

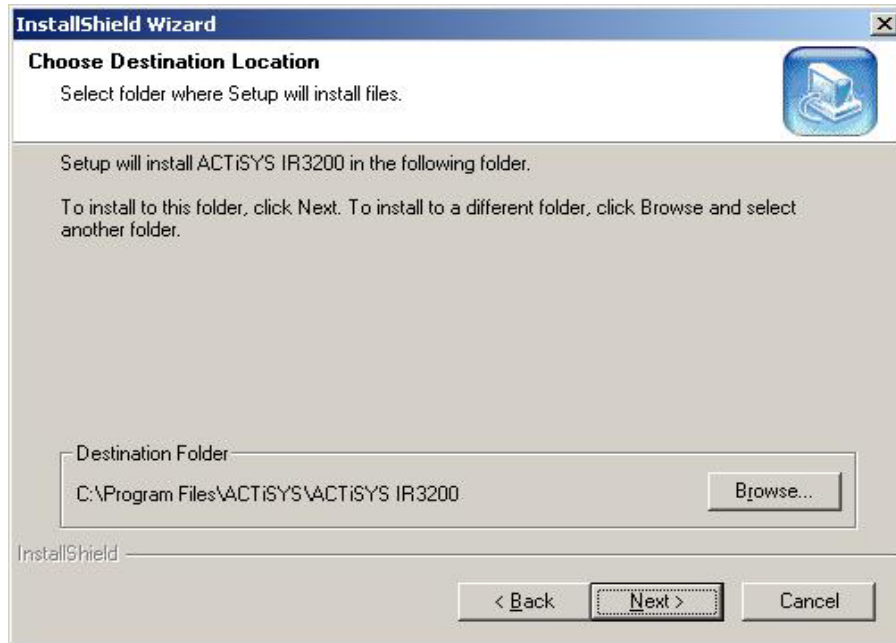


Click Next to continue

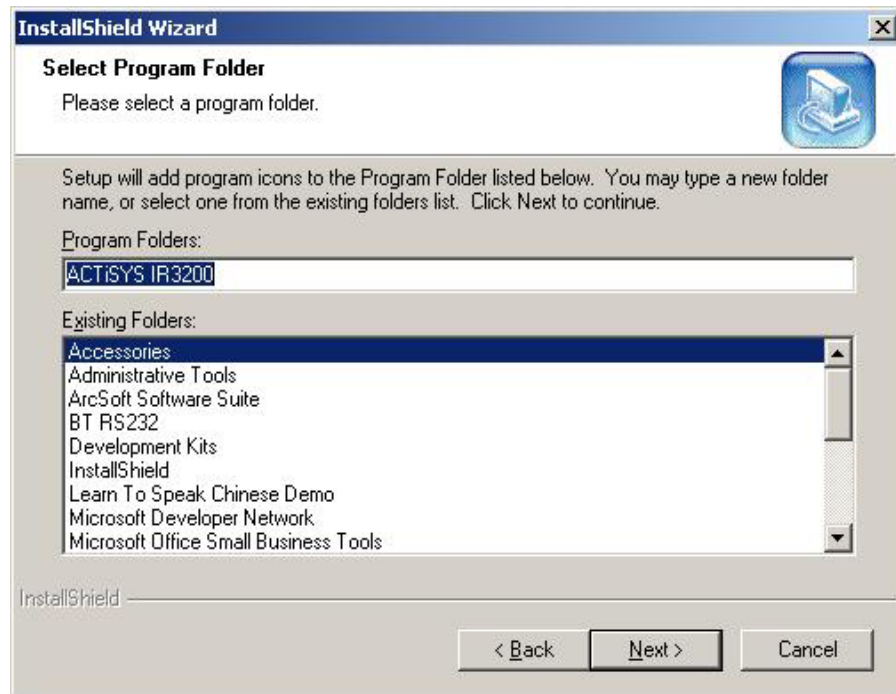
2. Read the End User License Agreement and Press "Yes" to Continue



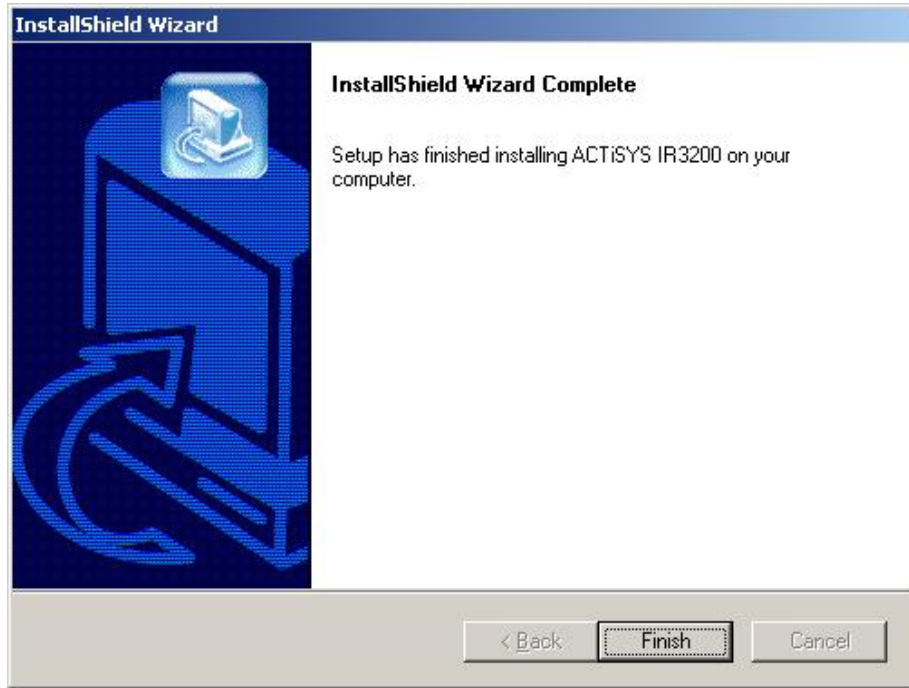
3. Press the Browse button, if you want to change the location. Press Next button to continue



4. Change the Program folder if required, Press Next to proceed



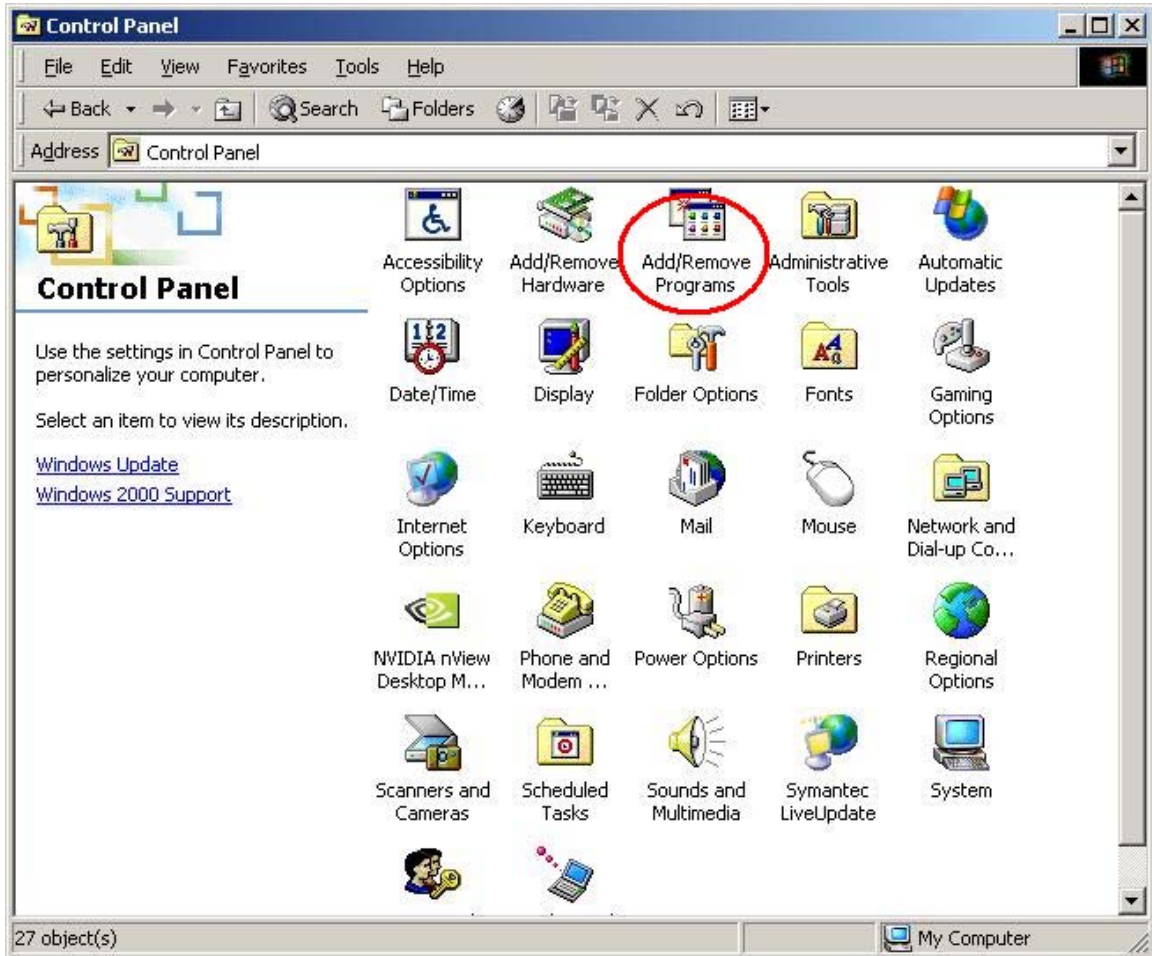
5. Then, setup wizard will install the application and finally confirms by the following screen



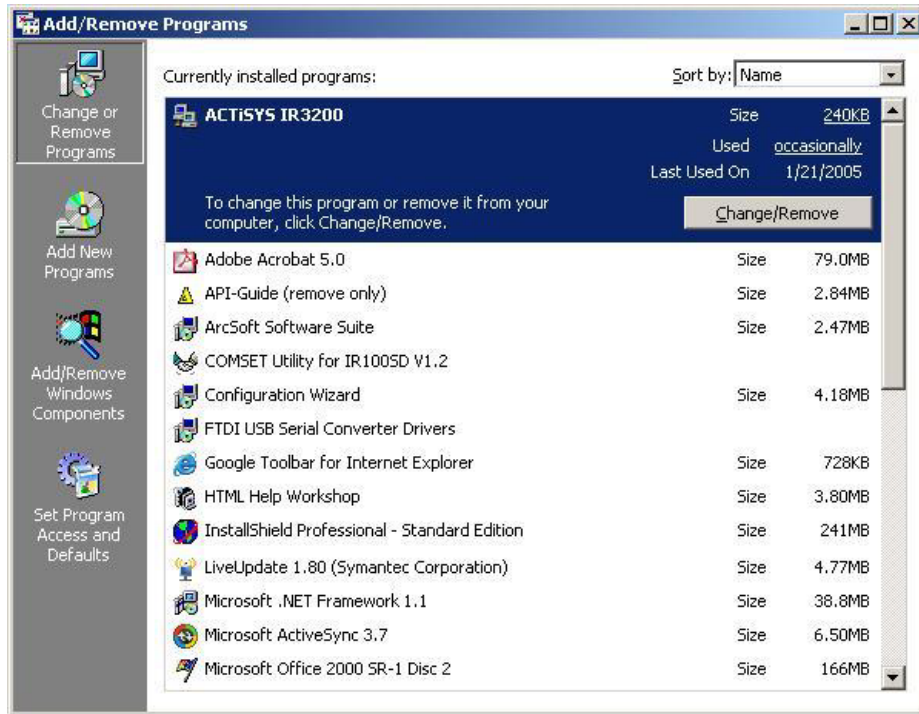
2) UN-INSTALLATION FOR ACT-IR3200SW SOFTWARE

Following is the un-installation instruction for ACT-IR3200SW software under Windows 2000

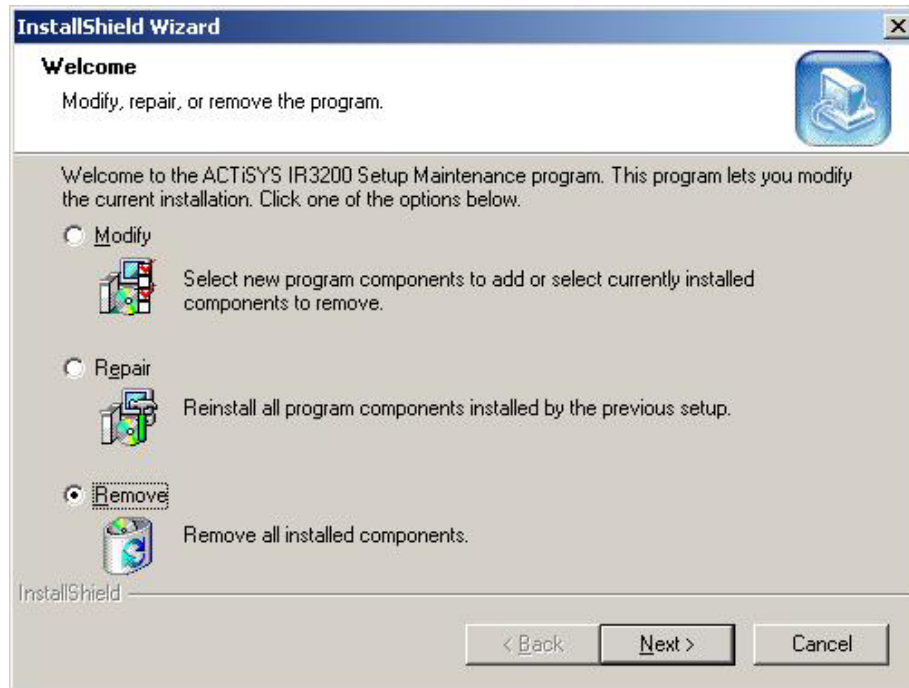
1. Open the **Control Panel** and select **Add/Remove Programs**.



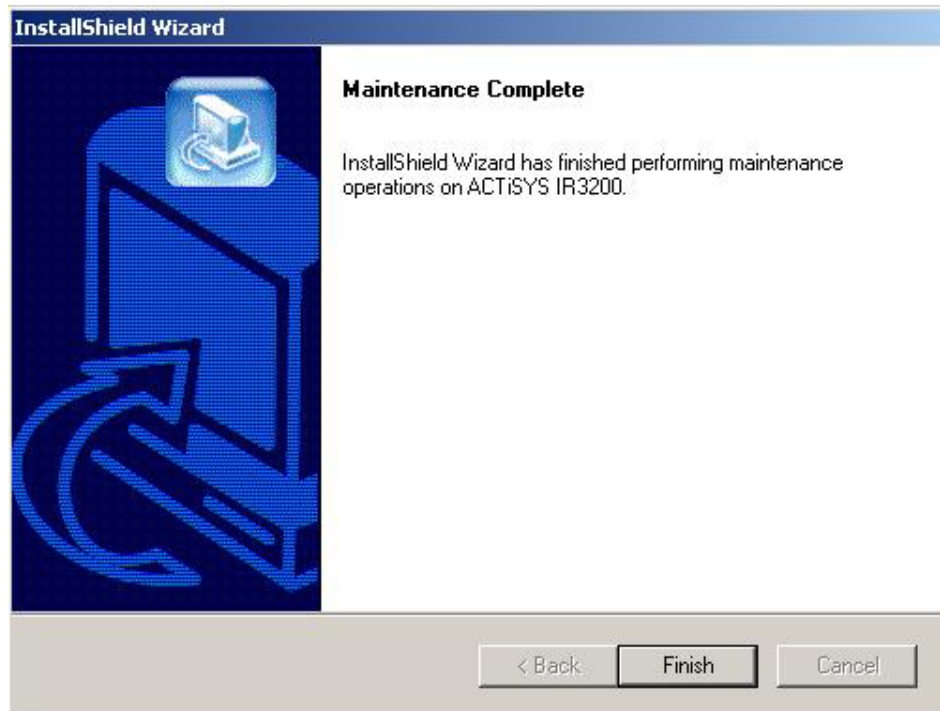
2. Select ACTiSYS –IR3200SW and press Change/Remove



3. Select Remove Option and press Next to continue un-installation

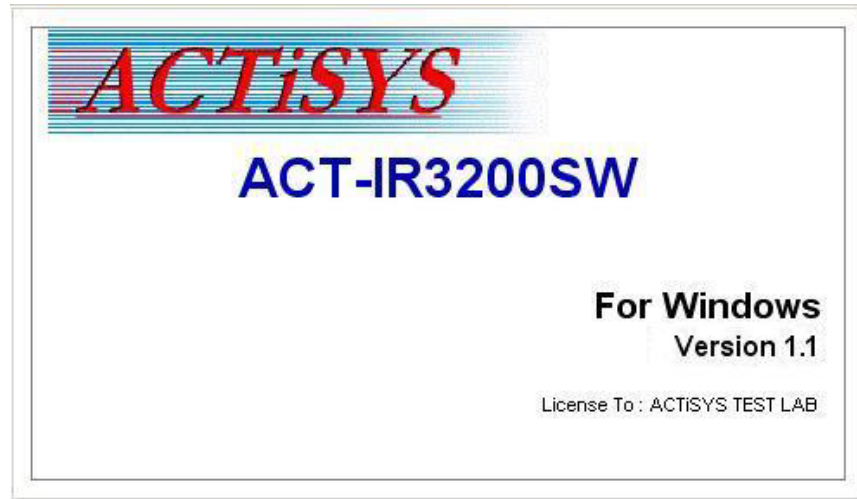


4. Un-install wizard get confirmation and automatically remove ACT-IR3200SW and all its components



3) APPLICATION GUIDE

After successfully completing the installation, now press the shortcut link in the program menu.



4) MENUS

Configuration

- Communication Setting
- Check Device
- Sound
- Test Cycle
- Configuring Test Cycle

Testing

- IR Detect
- Basic Test
- Custom Test

About

Quit

INTRODUCTION

IR3200SW is a user interface of the ACTiSYS Handheld Tester ACT IR3200M for writing customer test scripts and monitoring the test. It runs under Windows.

IR3200M is a FIR/MIR/SIR Handheld Tester for testing IrDA devices. It uses standard IrDA procedures to test IrDA-compliant devices. It is not a comprehensive diagnostic or evaluation test but should be used to aid production QA tests of IrDA devices.

IR3200M has complete hardware and software built-in and can do the customer's tests stand-alone. It has a serial port RS-232 for customer test script editing, loading and test process monitoring with a desktop or notebook PC. The serial communication with PC is only receiving commands and sending result string, so that its IR speed can be as high as 4 MBPS and the cabling will not be its bottleneck.

The design of the hardware and software in the device under test (DUT) are assumed to have been fully debugged and tested to be IrDA-compliant. The goal of this program is to catch as many QA problems as possible. To catch the remaining QA problems, a more elaborate test program and disproportional amount of test time are needed. A thorough but very time consuming test is not necessarily desirable for production QA test and definitely beyond the scope of IR3200M/SW.

The main features of IR3200M/SW include its capability to discover an IrDA device in range, make connection and conduct performance tests using TEST frames. The DUT must support TEST frames, which is an suggested IrDA feature

The test process of one item will abort immediately if any error happen during discovery, make connection or test frame transfer. It will go on with the next one to avoid being stuck there for some possibly existing problem of DUT.

The Link Disconnect Time has been chosen to be 8 secs. This implies that if a link is disrupted during frame transfer. The next test can be continued after the lapse of 8 secs during which period the DUT times out and enters NDM again. However, for performance tests, the IrDA devices may be moved out of range for a max of 8 secs for the tests to continue. This feature has been included mainly for distance/angle testing.

When a DUT fails, there could be several reasons for it:

- (1) Hardware Failure
- (2) Software Failure.

Again, software failure could be because of IrDA-deviation or a bug in the IrDA stack. These need to be investigated carefully.

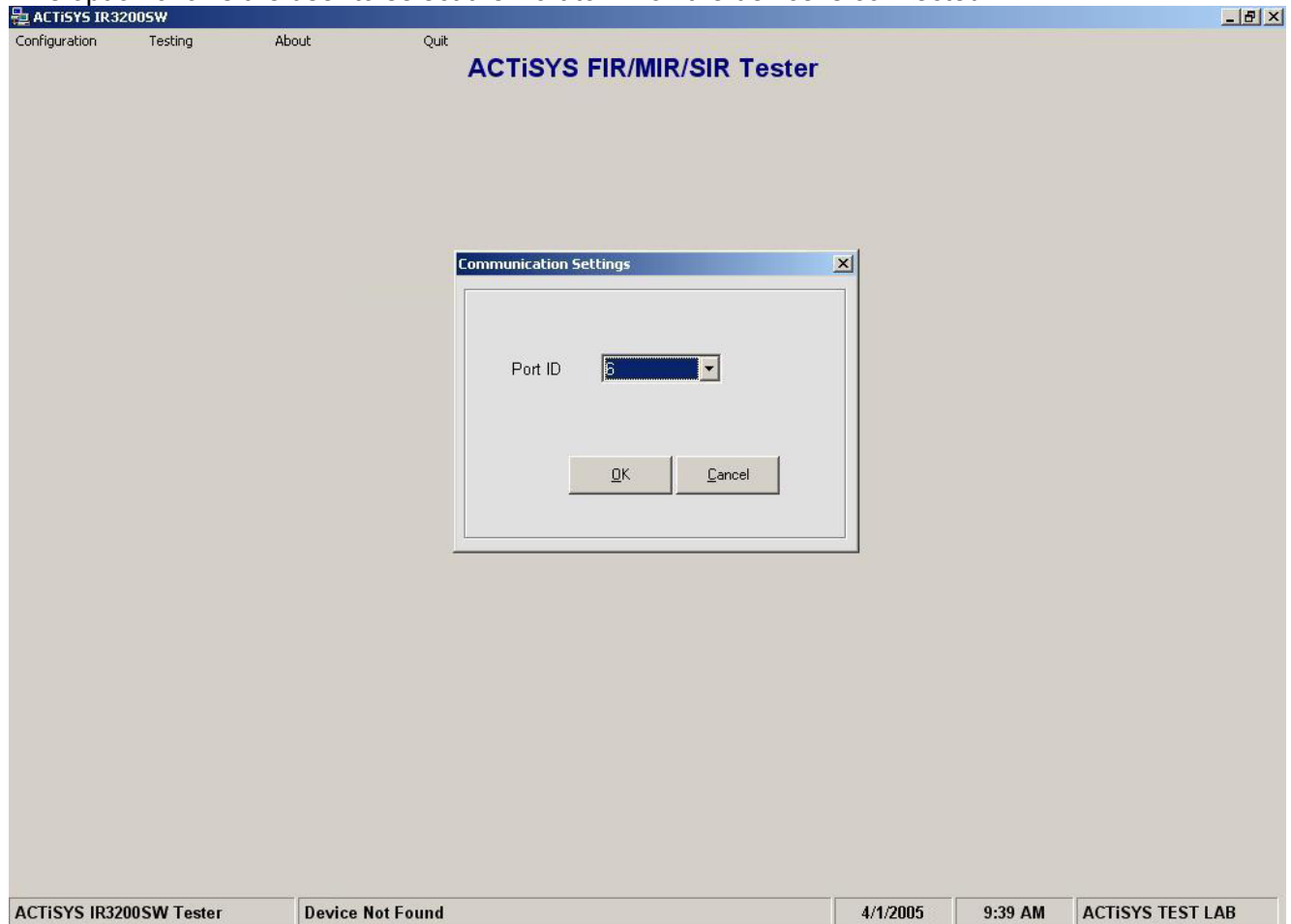
PASS does not mean that the DUT is IrDA-compliant. It means there were no preliminary QA problems. IR3200M/SW does not provide a comprehensive test of IrDA stack.

Performance test settings are based on the DUT's capabilities. For example, a DUT that supports max Frame Size of 1K, may not be tested for 2K. Likewise, a DUT that does not support FIR, may not be tested for that speed.

A) CONFIGURATION

I) COMMUNICATION SETTINGS

This option allows the user to select the Port to which the device is connected.



II) CHECK DEVICE

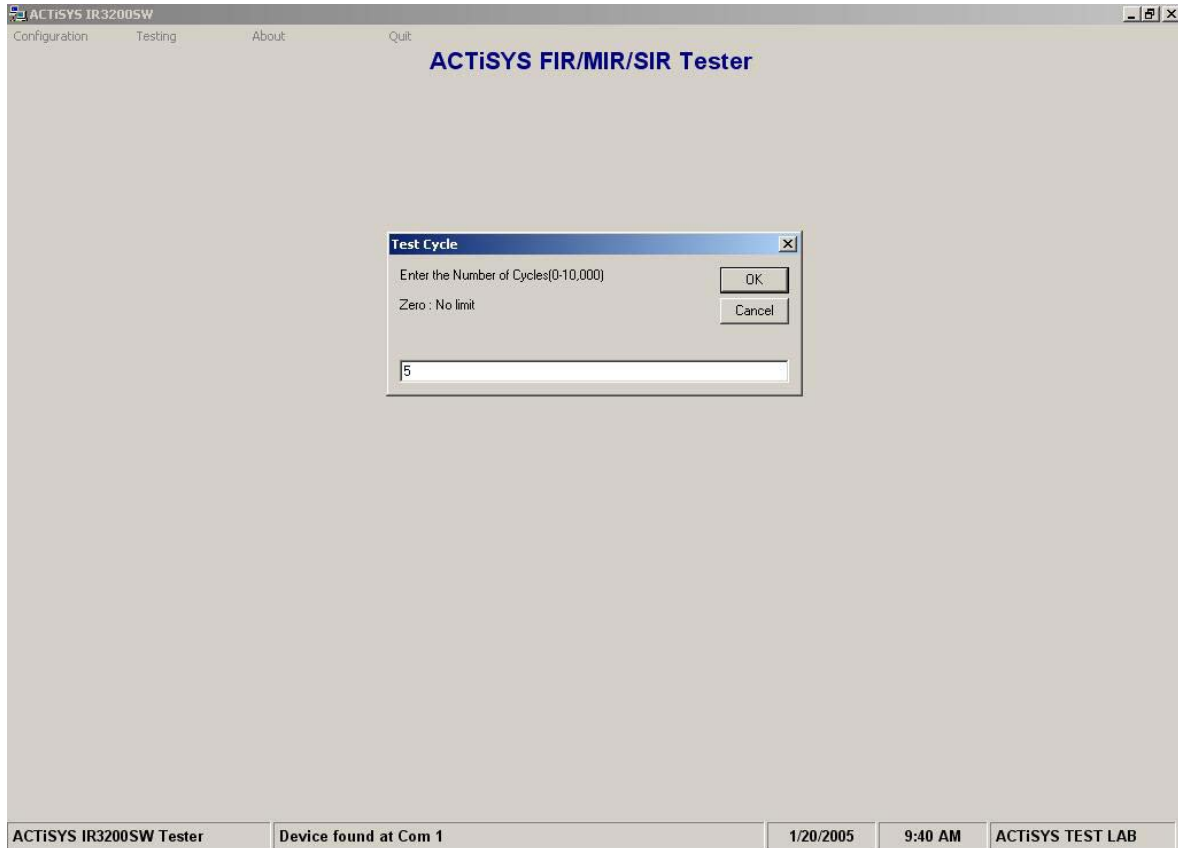
This option allows the user to check the connected device is working or not. If device not found the 1) Check the Port number. 2) Unplug and Plug the device again

III) SOUND

This option allows the user to set Sound ON/OFF in the Device

IV) TEST CYCLE

This option allows the user to set the number of Test Cycle(0 – 10,000). Zero indicates infinite number of test.



V) CONFIGURING CUSTOM TEST

This option allows the user to configure the Custom Test Parameters. Edit the Values and then select the Options

Delete : Deletes the selected test item from the table. Use the Test Number parameter to select the test item

Insert : Insert the Test item in to the Table

Update : Update/Modify the selected Test Item

Open Script : Allow the user open the existing Test Script from the System

Factory Defaults for Custom Test

Number of Test : 8

Test No	Baud Rate	Frame Size	Pattern	No of Test Frames
1	4.00 Mbps (FIR)	256	Random	4
2	1.152 Mbps (MIR)	256	Random	4
3	0.576 Mbps (MIR)	256	Random	4
4	115.2 Kbps (SIR)	256	Random	4
5	57.6 Kbps (SIR)	256	Random	4
6	38.4 Kbps (SIR)	128	Random	4
7	19.2 Kbps (SIR)	64	Random	4
8	9.6 Kbps (SIR)	64	Random	2

B) TESTING

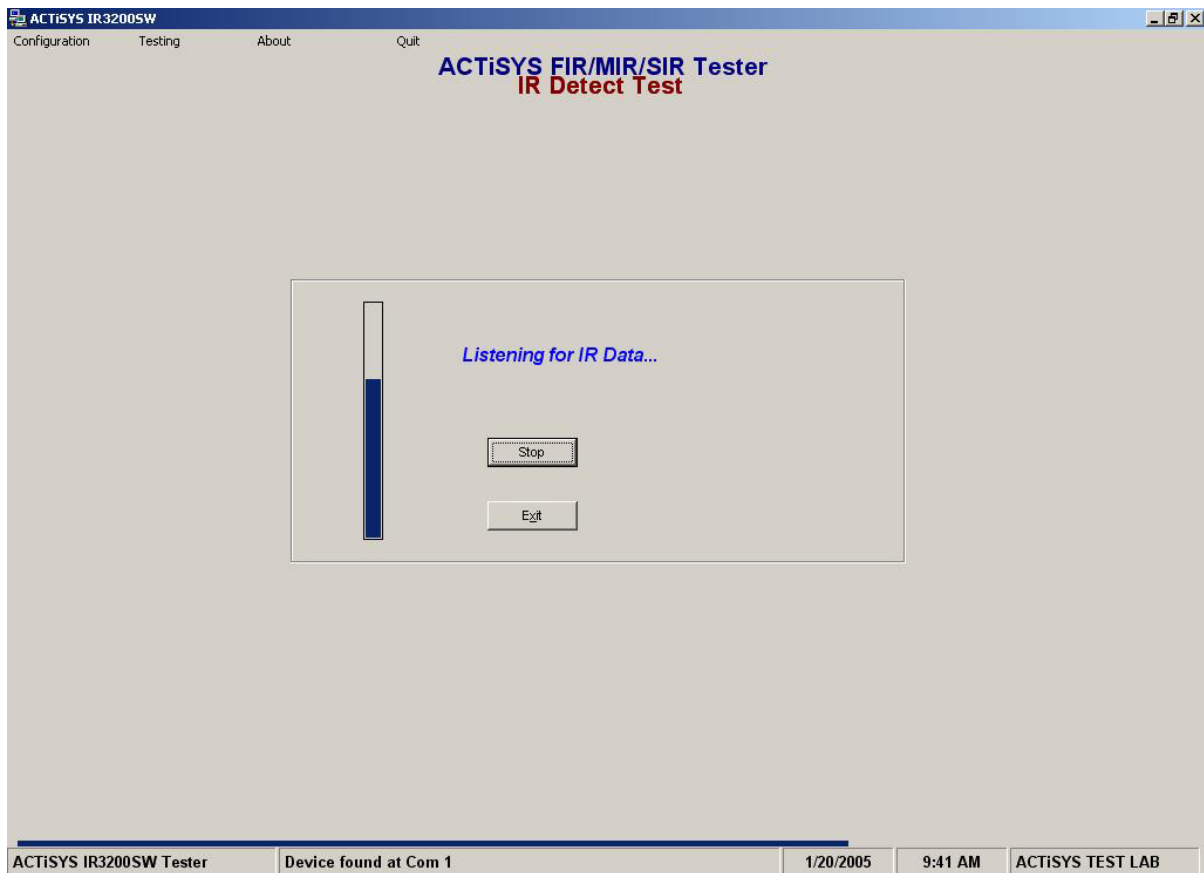
I) IR DETECT TEST

This option search for IR Signal in the media. If any IR signal found the progress bar in the screen will be raised.

Start : To start the Test

Stop : To Stop the Test

Exit : To exit from this test.



II) BASIC TEST

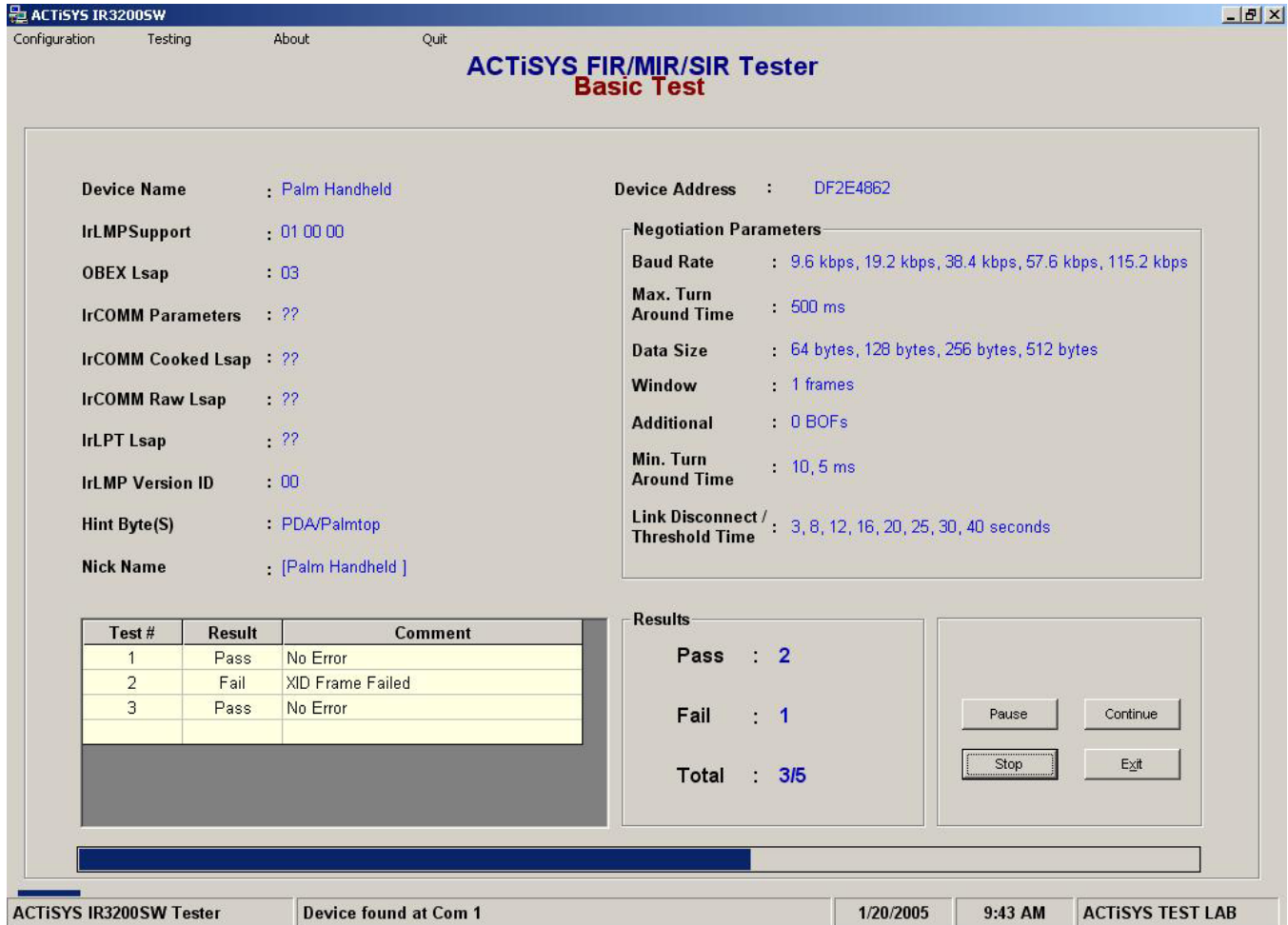
This Option allows the user to Test the Basic Test Parameters.

Start : Start the Basic Test. Number of cycle is based on the Test Cycle Settings.

Stop : To Stop the Test Cycle

Pause : To Pause the Test Temporarily

Continue : To Continue the Test Cycle



III) CUSTOM TEST

This option allows the user to execute the Custom Test. System will automatically execute the Custom Test Cycle based on the Test Cycle Configuration Settings.

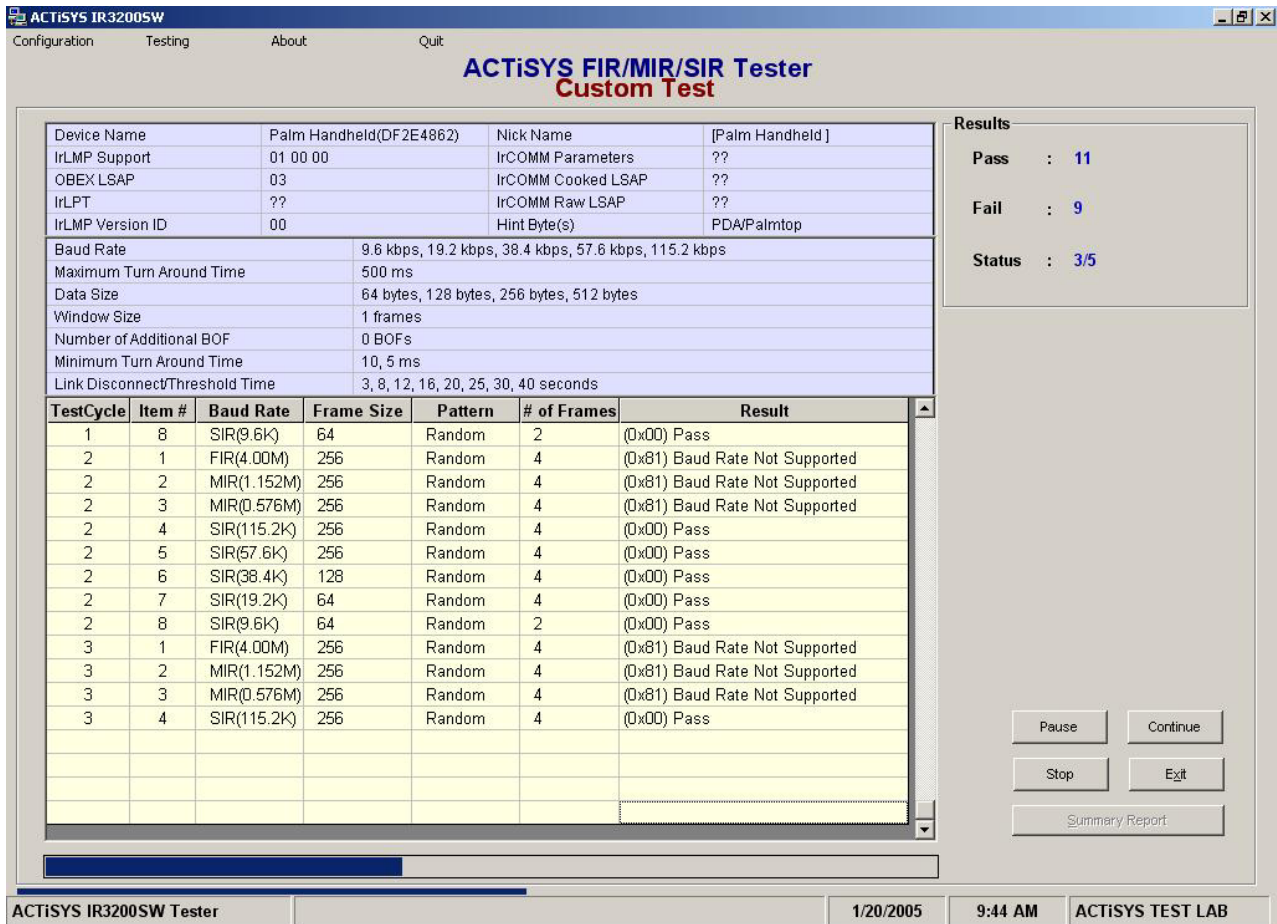
Start : Start the Custom Test.

Stop : To Stop the Test Cycle

Pause : To Pause the Test Temporarily

Continue : To Continue the Test Cycle

Exit : To exit from this option



C) ABOUT

Gives information about the Application and other Contact Information

D) QUIT

Quit from the Application

5) TEST SCRIPT AND PARAMETERS

- Speed
Data transfer speed, supports SIR (9600, 19.2K, 38.4K, 57.6K, 115.2K), MIR (0.576M,1.152M) and FIR (4M).

- Frame size of the test frame, 64, 128, 256, 512, 1024, or 2048 bytes.
Note 1: Some device does not support big frame for test even it tell you "I do" during the negotiation. That is only for data transfer. For example, windows IrDA stack support 2048-byte for data transfer but only 256-byte and less for test frame.
Note 2: At low speed use big frame may fail cause by the Max Turnaround Time. For example at 9600 and MTAT is 500 ms, to transfer a 512-byte frame may take

- Number of frames: 1- 255

- Data Patterns of Test Frame
 1. **All 00**: all 0x00. Each SIR byte has nine IR pulses.
 2. **All FF**: all 0xFF. Each SIR byte has only one IR pulse.
 3. **Random**: pseudo random sequence of bytes
 4. **00&FF mixed**:
Repeated sequence of the following 8 bytes:
{0x00,0x00,0x00,0x00,0xFF,0xFF,0xFF,0xFF}
 5. **Double width**: (special for FIR test) all 0x33
 6. **Mixed pulses**: (special for FIR test) Repeated sequence of the following 5 bytes: {0x33,0x33,0xBE,0x88,0x88}

- Number of cycles: 0 - 10,000. 0 means no limit. The default is 2.
Cycle: have sent and received all test frames with the defined parameters, such as speed, frame size, number of frames, data pattern.

6) THE MEANING OF TEST RESULTS AND ERROR CODES

Test Result	Error Code	Remark
Pass	0x00	No error.
Frame truncated	0x01	XIR, SNRM, RR, and TEST successful. But the Test response(s) received is (are) truncated. This is allowed according to IrLAP Version 1.1, but the propose of sending and receiving TEST commands/responses are not accomplished (due to this loophole in IrLAP Version 1.1)
XID frame failed	0x99	after repeated 0-slot XID commands, IR3200M did not receive correctly formatted XID response.
SNRM frame failed	0x89	XID successful, SNRM sent, IR3200M did not receive correctly formatted UA response.
RR frame failed	0x79	XID and SNRM successful, IR3200M received UA response indication that the intended data rate is supported and set to this data rate. But after IR3200M repeated sending RR commands at that data rate, IR3200M did not receive correctly formatted response.
Rate not supported	0x81	XID and SNRM successful, IR3200M received UA response indicating that the intended data rate to be tested is not supported.
First test frame failed	0x09	XIR, SNRM, and RR successful, but IR3200M never received any correctly formatted Test frame response.
Test frame failed	0x02	IR3200M will disconnect the connection and quit the current test item if it failed to get correct response to anyone of its test frames. This error means that XIR, SNRM, RR, and at least one TEST successful there after.

Pass = no any bit error happened with this cycle.

Failed = any error happened with this cycle.

Error Rate = failed Cycles / Cycles tested

7) PHYSICAL LAYER TEST

Check the frame encoding/decoding (Byte stuffing of SIR, Bit-stuffing of MIR or 4 PPM encoding/decoding).

Receiver sensitivity test.

To socialite frames from the secondary device for measuring its physical layer parameters, such as transmitter intensity, timing parameters.

8) IRLAP TEST

Check the basic IrLAP layer implement, such as Discovery (XID), Negotiate (SNRM), Data sending / receiving at different speed (FIR/MIR/SIR), FCS (Frame Check Sequence) implements, speed support and changing and etc.

9) BER TEST

FFS (Far Field Source), NFS (Near Field Source) test.

A) PRESCRIPTION:

- The device under test (DUT) can be either a Primary or a Secondary Station. But during the test, the DUT always plays the Secondary role.
- The DUT will use its native IrDA hardware and native IrDA driver stack, which implemented the **Test Frame**² in IrLAP as specified in the IrDA Protocol Spec. No special test software is necessary during the test at the DUT side.
- The Tester (Test Reference station) is a PC with IrDA hardware of controlled IR emission intensity (e.g. ACTiSYS IR2000B/L) and a special test software (e.g. ACTiSYS ACT-IR9003SW), but not stack testing. Tester always plays Primary role.
- The BER test at low speed is most time costly. Practically communication failures happen mostly at higher speed and the speed 9600 is the common speed at NRM for discovery and negotiation. To accelerate the BER test we will reduce the test bit-amount of 9.6k and 38.4k test from 10 MBITS to 1 MBITS.
- We check the working range (distance at different angle) of transmission by the Intensity measurement and Sensitivity tests. So the BER test will be done only at angle 0°. This is also for accelerate the IrDA compliant test and will provide us with the some information we need.
- NFS (Near Field Source) Test
 - Measure the BER with a strong signal source at near distance.
 - Signal strength: 500mW/cm² according to IrDA Physical spec.
 - Irradiance = 500mW/cm² using source 590mW/Sr at 1.1cm to test all speeds
- MFS (Mid Field Source) Test
 - Measure the BER with a normal transceiver at medium distance. This may reflect the normal application condition.
 - Signal strength: ~175uW/cm²
 - Irradiance = 175uW/cm² using source 152mW/Sr at 30cm to test all speeds
- FFS (Far Field Source) Test
 - Measure the BER with a weak signal source at far distance.
 - Signal strength: 10μW/cm² to test FIR (4M) and MIR (1.152M)
 - 4μW/cm² to test SIR (9600 - 115.2K)
 - The irradiance of this DUT is about 100mW/Sr. The irradiance of reference should be weaker than it so we can focus attention only on the DUT side.
 - a) Irradiance = 10μW/cm² using source 27mW/Sr at 52cm to test 4M & 1.152M bps

² [ACTiSYS IrDA Test Frame and Free Source Code \(www.actisys.com/CompTest.html\)](http://www.actisys.com/CompTest.html)

- b) Irradiance = $4 \mu\text{W}/\text{cm}^2$ using source 27mW/Sr at 82cm to test 115.2K & below

B) TEST ITEMS:

Use the calibrated IrDA Reference Testers and IrLAP-Test Frame to test the DUT. This test focuses on the receiver's strong intensity tolerance and weak signal sense capability.

1. Validate all supported speeds and the maximum frame size of test frame.
2. Initial BER Test
3. Fine BER Test

C) DESCRIPTION OF TEST ITEMS:

I) Validate all supported speeds and the maximum frame size of test frame.

Run the test program to discover the DUT. It will show the DUT's nick name, Speed and Frame Size.

The maximum frame sizes of test frame may be less than the maximum frame size of data transfer depends on the designer. So use a special test script with different speeds and frame size to find out the available maximum frame size of test frame.

II) Initial BER Test

Check the communication at different speed and different distance for a short time. If it fails the far or near test at this speed will not go on.

III) Fine BER Test

Includes FFS, MFS and NFS tests.

FIR BER test will check 100 Mbits to see if its BER is less than $10\text{E}-8$.

e.g. 100M bits = 1024 bytes * 100 frames x 100 cycles

frame size = 1024 bytes, number of frames = 100, cycles = 100

SIR BER test will check 10 Mbits or 1M bits to see if its BER is less than $10\text{E}-7$.

e.g. 10M bits (at 115.2k, 38.4k) = 1024 bytes * 10 frames x 100 cycles

frame size = 1024 bytes, number of frames = 10, cycles = 100

e.g. 1M bits (at 9.6k, 19.2k) = 128 bytes * 10 frames x 100 cycles

frame size = 128 bytes, number of frames = 10, cycles = 100

10) WARRANTY INFORMATION

ACTiSYS Corporation warrants to the first consumer purchaser, for a period of 1 year from the date of purchase, that this wireless interface (The Product) will be free from defective workmanship and materials, and agrees that it will, at its option, either repair the defect or replace the defective Product or part thereof at no charge to the purchaser for parts or for labor.

This warranty does not apply to any appearance items of the Product, any consumable items such as paper, ink ribbon, or batteries supplied with the Product, or to any equipment or any hardware, software, firmware, or peripheral other than the Product. This warranty does not apply to any Product the exterior of which has been damaged or defected, which has been subjected to misuse, abnormal service or handling, or which has been altered or modified in design, construction or interfacing. Tampering with Label Voids Warranty.

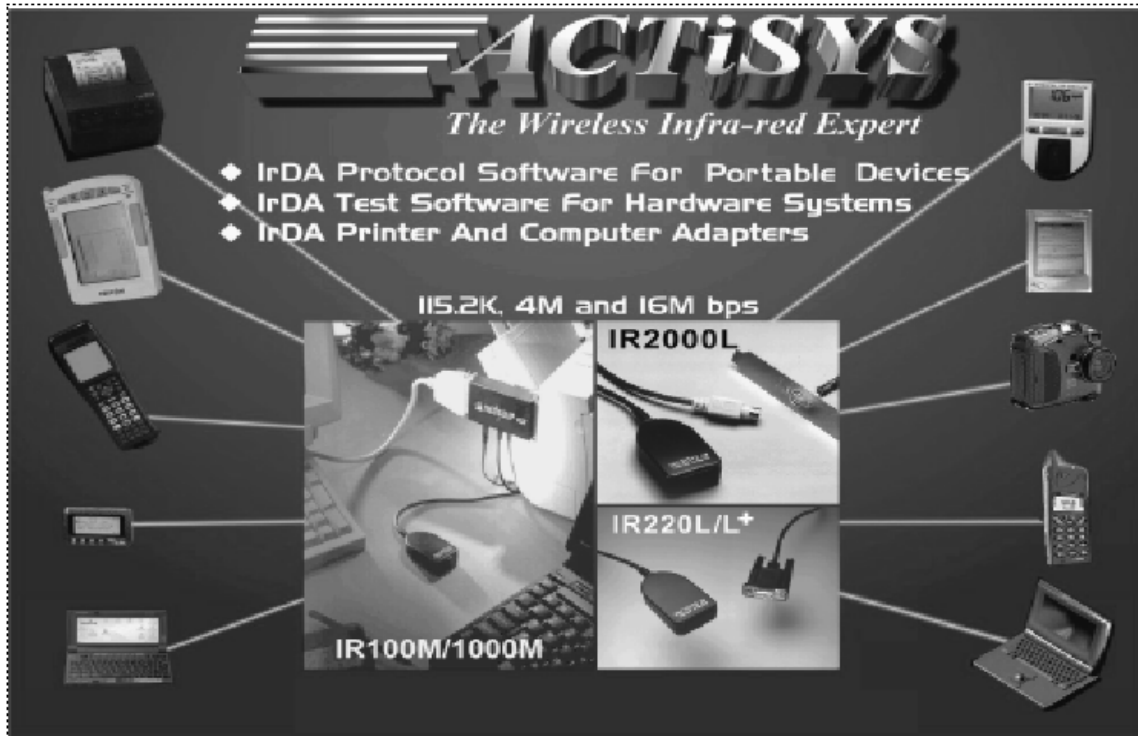
In order to enforce the rights under this limited warranty, the purchaser should mail, ship or carry the Product, together with proof of purchase, to ACTiSYS.

The limited warranty described above is in addition to whatever implied warranties may be granted to purchasers by law. To the extent permitted by applicable law, ALL IMPLIED WARRANTIES INCLUDE THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USER ARE LIMITED TO A PERIOD OF 1 YEAR FROM THE DATE OF PURCHASE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Neither the sales personnel of the seller nor any other person is authorized to make any warranties other than those described above, or to extend the duration of any warranties beyond the time period described above on behalf of ACTiSYS Corporation.

The warranties described above shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described above, shall constitute full satisfaction of all claims, whether based on contract, negligence, strict liability or otherwise. In no event shall ACTiSYS Corporation be liable or in any way responsible, for any damages or defects in the Product which were caused by repair or attempted repairs performed by anyone other than ACTiSYS technician. Nor shall ACTiSYS Corporation be liable or in any way responsible for any incidental or consequential economic or property damage. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

11) CONTACT INFORMATION



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