

Infrared Data Association

IrDA Adapter Application Profile and Test Specification



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IrDA Adapter Application Profile and Test Specification Working Group Convener:

Keming W. Yeh, ACTiSYS kveh@actisys.com

Contributors:

Glade Diviney, Extended Systems gladed@extendsys.com
Lichen Wang, ACTiSYS lwang@actisys.com
Don Scrutchfield, Sigmatel dscrutchfield@sigmatel.com

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1 INTRODUCTION

This document defines the IrDA Adapter Application Profile and Test Specification. To be IrReady certified, an adapter must pass, within accepted limits of the operation and tests described by and referenced within this document.

Section 2 defines the two types of IrDA adapters. Section 3 describes the IrDA Adapter Usage Model upon which the Application Profile is based. Section 4 presents the IrDA Adapter Application Profile. Section 5 summarizes the IrDA Adapter IrReady Test Specification.

1.1 Scope

This profile and test specification applies to IrDA adapters that are used for infrared IrDA-Data (9.6K to 16M bps) communication.

1.2 References

- 1) IrPHY Measurement Guideline, Version-1.1, Sept. 8, 2000, Infrared Data Association

2 CLASSIFICATION

2.1 Overview

IrDA-Data was initially defined and adopted in 1994. It is recommended for high speed, short range, line of sight, point-to-point wireless data transfer. Infrared Data Association was formed as a not-for-profit association in 1992. IrDA currently has over 140 member companies from all over the world and as of June 2001. There are over 400 million devices that have implemented the IrDA capability.

But there are still numerous electronic devices without the IrDA capability. In order to provide the IrDA connections for these devices, IrDA adapters are introduced to attach to these electronic devices to immediately provide the IrDA capability.

2.2 IrDA Adapter Classification

IrDA Adapters are classified into two categories.

2.2.1 Passive Adapter

IrDA Adapters that have no internal IrDA stack are passive. In order to make them work, they must be connected to a host system that is able to run an IrDA protocol stack with an appropriate device driver.

A passive adapter itself is not a complete IrDA-enabled device. However it is more than just an IrDA component because it is a separate unit in the eyes of the consumer, and therefore, needs IrReady certification to ensure a positive user experience.

There is another type of IrDA passive adapter which is a detachable part of a specific electronic product which has built-in IrDA protocol driver. This type of IrDA passive adapter can not be used for other products in the same functional category, e.g. parallel printer. It is still IrReady certifiable as long as it meets these qualifications: a) it is available as a separate product, b) it is clearly marked for which platforms it can be used with.

2.2.2 Smart (or Active) Adapter

IrDA Adapters are classified as smart (or active) adapters if they have an internal IrDA stack and can communicate without specific device drivers or other software loaded onto the host device. They can exchange data with another IrDA-capable device independently and communicate with the attached host device via other protocols.

A smart adapter may operate as stand-alone device, or may be connected to a host system (PC, RS232 serial devices, serial or parallel printer, etc.), and may operate with or without the OS-supplied IrDA protocol stack.

3 USAGE MODEL

This section describes the consumer's expectation for both passive and smart IrDA adapters.

3.1 IrDA Passive Adapter Usage Model

Some users may have an electronic product that has a ready IrDA protocol stack built-in, such as a personal computer with operating system; Windows 95, 98, Millennium, 2000 or XP. But these products may not be equipped with IrDA hardware.

By attaching an IrDA Passive Adapter to these host systems, the consumer may:

- Exchange data or files with another IrDA-enabled desktop or notebook PC.
- Exchange data or files or synchronize with a PDA.
- Exchange data or files with mobile phone.
- Print directly through an IrDA-enabled printer.
- Receive pictures from an IrDA-enabled digital camera.

The value to the consumers to have IrDA passive adapter certified as "IrReady" is as follows:

- Assures reliable, error-free data exchange.
- Assures fast and reliable suspend and resume of data exchange when IR path is temporarily blocked.
- Assures convenient and trouble-free driver set-up when following user's manual of adapter product.

3.2 IrDA Smart (or Active) Adapter Usage Model

Certain electronic products may not come equipped with an IrDA protocol stack, such as PC with Windows NT, modem, printer, monitoring devices, instrumentation, PLC/automation equipment, medical devices, or industrial data terminal. Such an electronic product may rely on other non-IrDA communication protocols such as RS232 serial, Centronics, etc.

By attaching an IrDA smart adapter to such host electronic products, the user may achieve IrDA wireless data exchange without the need for IrDA protocol running on these host electronic products:

- Exchange data or files with IrDA-enabled notebook computer.
- Synchronize data or files with IrDA-enabled PDA.
- Receive wirelessly dial-up command from IrDA-enabled mobile devices.
- Print wirelessly through an IrDA-enabled printer.

The value to the consumers to have IrDA smart adapter certified as "IrReady" is as follows:

- Assures reliable, error-free data exchange.
- Assures fast and reliable suspend and resume of data exchange when IR path is temporarily blocked.
- Assures convenient and trouble-free driver set-up when following user's manual of adapter product.

4 IRDA ADAPTER APPLICATION PROFILE

4.1 Host Profile

IrDA Passive and Smart (or Active) Adapters assume the identity of the host device Application Profiles it is attached to. If the host device is a non-IrDA data transfer serial device, like desktop PC, when connected to such host device, this IrDA adapter is of the same data transfer serial device, except it is IrDA enabled. If the host device is a non-IrDA printer, this IrDA adapter is of the same printing device, except it is IrDA enabled.

Either the passive or the smart adapters must survive the test procedures specified for the host device Application Profile (e.g. Point and Shoot, IrModem, and others).

In the scheme of IrDA definitions, passive adapter consists of IrDA transceiver, controller (RS232 or USB interface) and the framer and device driver that interfaces with the host IrDA stack. The transceiver, controller and host stack must be properly designed and implemented. However, these still do not automatically guarantee the combined host and passive adapter will successfully pass IrDA physical, inter-op or protocol tests, if passive adapter has poor PCB layout or manufacturing, enclosure window, framer or driver.

5 IRREADY TEST SPECIFICATION

5.1 Basic Test Requirement for IrDA Adapter

IrDA Adapter Profile Test Specification is the same as the Point and Shoot Profile Test Spec. except for the additional requirement that this IrDA Adapter must be attached to a host device. IrDA adapter manufacturer must specify the host platforms on which the adapter is qualified to run. The manufacturer should provide the list of Operating Systems and Hardware types their adapter supports. IrReady certification test should include verification that the adapter indeed supports the advertised O.S. & Hw and that the product documentation and marketing do not claim anything more.

5.1.1 IrDA Passive Adapter

As passive adapters have to implement the IrDA capability together with the host system equipped with IrDA protocol stack and the appropriate device driver, they will be certified as IrReady only when connected to this specific host system with specific Operating System.

5.1.2 IrDA Smart Adapter

As smart adapters have internal IrDA protocol stack and are able to perform the full IrDA capability alone, smart adapters can be certified as IrReady either as stand-alone or when connected to an intended host system. Based on its specific function, a smart adapter will be certified as IrReady only specific to its intended application, such as IR data transfer as stand-alone device or when connected to an RS232 serial host device, or IR print when connected to the appropriate printer.

5.2 Required IrReady Tests for IrDA Adapters

This document defines the required basic tests and procedure for IrDA passive or smart adapter.

At the “IrReady” Test Lab, the following product attributes and test procedures will be evaluated:

1. Clear Instructions and Trouble-Free Installation:

How clear are the instructions provided with the adapter that result in a working configuration.

2. Serial Infrared Physical Layer Link Test (IrPHY)

Refer to Reference 1): IrPHY Measurement Guideline, Version-1.1, Sept. 8, 2000, Infrared Data Association, Chapter 4: IrReady IrPHY Test Procedure

2.1. BER Test:

When doing the physical layer link test, the following items will be taken into consideration and test results will be submitted with different settings.

- Distance: Near Field Source and Far Field Source
- Angle Range: Within 30 degrees.
- Test File Size: Frame Size, Number of Frame.
- Maximum/Minimum Intensity in Angular Range
- Speed: All advertised speeds are supported

Under all above environment, the Bit Error Rate (BER) shall be no greater than 10^{-8} . The link shall operate and meet the BER specification over its range.

2.2. Intensity Test (Refer to Reference 1)

2.3. Sensitivity Test (Refer to Reference 1)

2.4. Timing Test (Rise, Fall, Jitter timing) (Refer to Reference 1)

- 3. IrDA Protocol and Inter-Op Profile Test:** These tests apply to smart adapter, or host device with passive adapter attached. In the latter case, it is testing the host device to have IrDA stack implemented properly. It is also testing the stack-to-IrDA physical interface framer and device driver. For RS232 passive adapter, the framer and device driver reside in the host O. S. For USB passive adapter, the framer resides in the adapter (controller IC) and device driver resides in the host O.S.

3.1. Serial Infrared Link Access Protocol Test (IrLAP)

When doing the link access protocol test, the following function will be tested and must be passed.

- Link Startup and Shutdown
- Address Discovery
- Address Conflict Resolution
- Connection Establishment
- Sniff
- Information Exchange,
- Connection Reset and Disconnection

3.2. Link Management Protocol Test

When doing the link management protocol test, the following function will be tested and must be passed.

- Discovery
- IrLMP Connection
- IrLMP Data
- IrLMP Access Mode
- IrLMP Get Value
- IrLMP Disconnection

3.3. IrOBEX, IrCOMM or IrLPT Test

These tests must be passed according to its intended application. For example, a printer IrDA adapter must pass the IrLPT test, and an RS232 smart adapter with built-in IrDA stack including IrComm, must pass the IrComm test.

3.4. Inter-operability (Profile) Test

An IrDA adapter that supports IrObex should have the Point and Shoot capability built-in. The use of standard object types will guarantee that objects are correctly understood on the other device. The following tests must be passed.

- Connect
- Put
- Get
- Set Path
- Abort
- Disconnect

IrDA adapter which supports IrComm should pass the following tests.

- Connect (Different for IrComm or IrLPT service)
- Control
- Data
- Disconnect