

**Infrared Data Association (IrDA®)**  
**Infrared Financial Messaging (IrFM™)**  
**Qualification Program Reference Document**



Version 1.0.2

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## Document History

Date	Version	Description of Change
2002-11-05	0.3	Directional approval from IrDA
2002-01-20	1.0 draft	Proposed for draft & final status
2002-02-04	1.0 draft 2	Referred back to IrFM SIG for additional changes
2004-02-18	1.0.2 (draft)	Added references to "IrFM Evaluation Team" as having primary technical review responsibilities.

# Table of Contents

<b>1 Introduction</b> .....	<b>6</b>
1.1 Contributors .....	6
1.2 References .....	6
<b>2 Program Requirements</b> .....	<b>7</b>
2.1 Interoperability Goals .....	7
2.2 Technical Scope .....	7
2.2.1 Primitives, Transactions, Services, and Roles .....	7
2.2.2 Custom Features .....	7
2.2.3 Future Services .....	7
2.3 Revisioning .....	7
2.4 Component Qualification .....	8
2.5 Manufacturer versus Lab Testing .....	8
2.6 Confidentiality .....	8
2.7 Relationship to IrReady .....	8
<b>3 Overview</b> .....	<b>9</b>
3.1 Elements .....	9
3.1.1 Manufacturers .....	9
3.1.2 Components .....	9
3.1.3 Test Labs .....	9
3.1.4 IrFM Evaluation Team .....	9
3.1.5 IrFM SIG .....	9
3.1.6 Key Documents .....	9
3.1.7 IrDA Office .....	10
3.2 Qualification Process .....	11
3.2.1 Development of the Test Plan .....	12
3.2.2 Test Execution .....	13
3.2.3 Submission and Approval .....	13
<b>4 Other Issues</b> .....	<b>14</b>
4.1 Information Disclosure .....	14
4.2 IrFM Components .....	14
4.2.1 Pre-tested components .....	14
4.3 Re-submission .....	14
4.4 Specification Updates .....	14

Many IrDA members and other companies would benefit by successful adoption of IrFM technologies. This document is an attempt to bring the diverse needs and opinions of industry players together into a single, focused effort.

Over time it is expected that this document will transform into a normative definition of the IrFM Qualification Program, or be incorporated into other relevant IrDA documentation as necessary.

## 1.1 Contributors

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## 1.2 References

[IrFM PnP] *Infrared Financial Messaging Point and Pay Profile version 1.0*

[IrFM Test] *Infrared Financial Messaging Test Specification version 1.0*

[IrReady PRD] *IrReady Program Reference Document version 1.3.1*

## 2 Program Requirements

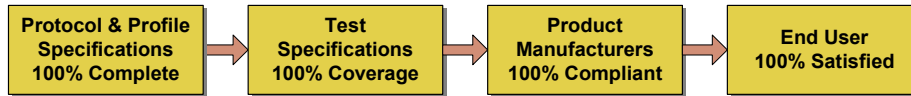
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This chapter defines the requirements for the IrFM Qualification Program.

### 2.1 **Interoperability Goals**

Interoperability is the ability of products from different vendors to communicate reliably. In a protocol compliance program, there are three primary goals used to achieve interoperability and a satisfying consumer experience.

The relationship between these goals is illustrated below:



Each goal is important because it influences the potential effectiveness of the following goal. A vague or incomplete protocol or profile specification will limit the effective coverage of the test specification. An incomplete test specification limits the degree to which manufacturers can test their compliance. And when vendors in the industry deliver non-compliant products, the end user inherits non-interoperable products.

To be effective, this program must provide processes that can achieve each goal. It is acknowledged that interoperability is affected by product attributes that go beyond what IrFM specifies, such as user interface, application services provided, etc. Therefore, the IrFM Qualification program cannot provide an absolute guarantee of interoperability between products.

### 2.2 **Technical Scope**

While the focus of IrFM is on the [IrFM PnP] document, it is recognized that IrFM interoperability depends both on reliable implementation of lower protocol and hardware layers, namely the infrared physical layer, IrLAP, IrLMP, Tiny TP, and IrOBEX. Compliance with lower layers is to be achieved by reference to existing specifications and programs.

In addition, higher application and interface layers may be required for a complete end-user solution. These layers are beyond the scope of this program, which aims only to provide a reliable, interoperable framework for upper-layer implementations.

#### 2.2.1 **Primitives, Transactions, Services, and Roles**

Tests must be specified for each feature defined in [IrFM PnP]. Furthermore it must provide a method for determining which test cases must be run for a particular device or component.

#### 2.2.2 **Custom Features**

Vendors may add custom features (such as new primitives, transactions, or services). For example, a credit, debit, or check card service may include proprietary service definitions. Testing such features is outside the scope of this program.

#### 2.2.3 **Future Services**

MICR data (for checks) and IrFM Voucher features are in planning stages, but at this point are not yet considered within the [IrFM PnP] or within this program.

### 2.3 **Revisoning**

This program must account for changes to the core protocol and profile specifications, the test specifications, and the program itself over time. Manufacturers must not be given undue compliance burdens as they aim at a moving target.

## 2.4 **Component Qualification**

There are a wide variety of types of marketable IrFM components possible, from individual hardware and software components all the way up to finalized end-user devices. It should be possible to test and qualify any marketable portion of a complete platform or a complete platform itself.

## 2.5 **Manufacturer versus Lab Testing**

Independent testing offers an enhanced degree of security above tests executed by the manufacturer. To the degree that tests can be specified exactly, this program should require independent execution of those tests by entities qualified to do so.

## 2.6 **Confidentiality**

This program must not require that a manufacturer divulge proprietary or confidential aspects of their product. However, aspects of compliance with the IrDA's public specifications should be considered public information. By making this information public, the IrDA reinforces the value of IrFM compliance and fosters the creation of an industry of IrFM components. It is expected that manufacturers who wish to maintain secrecy in advance of a product release will *not* qualify the product in advance.

## 2.7 **Relationship to IrReady**

This program must attempt to leverage the work already done in building the IrReady program. However, there are significant differences between IrReady and IrFM Qualification Program goals:

- IrReady targets the end user while this program targets vendors, integrators, and manufacturers.
- IrReady qualifies end-user devices. This program qualifies components.
- IrReady attempts to guarantee the minimum level of compliance to implement a profile, while this program attempts to achieve 100% protocol compliance.
- IrReady attempts to provide a one-size-fits-all approach where IrDA-enabled devices are compatible when it is "reasonably possible to do so". This program does not attempt such a broad approach, but focuses only on the ability of devices to perform individual financial transactions.

However, there are similarities to be leveraged:

- "Profiles" provide a map of protocol requirements
- IrReady Test Labs are already in place; this program should leverage the existence and capabilities of these labs.
- IrReady already provides the fundamentals of a process whereby the IrDA grants a certificate and license to use logos and trademarks.

## Overview

The ultimate mission of the program is as follows:

To promote the adoption of IrFM technologies by establishing concrete testing requirements, ensuring the testing requirements are met correctly, and affirming compliance between industry players.

The IrFM Qualification Program pursues this mission by:

- Uncovering and fixing omissions, inconsistencies, or other errors in specifications it relies upon.
- Ensuring that consistent and complete testing standards are available.
- Requiring manufacturers to comply with standards when marketing products that incorporate IrFM technology.

### 3.1 Elements

This section defines the various elements of the IrFM Qualification Program.

#### 3.1.1 Manufacturers

Manufacturers are organizations that produce IrFM components or devices. Using the IrFM qualification process gives them marketing benefits, such as the right to state that a product is "IrFM Qualified" in product literature or marketing materials. The phrase "IrFM Qualified" cannot be used in conjunction with a manufacturer's product unless the product has been qualified as described in this document.

In addition, by relying on IrFM qualified components when integrating a system, manufacturers have a clearer understanding of the features supported by the component, and some measure of confidence that the features are implemented correctly.

#### 3.1.2 Components

Components are products offered by manufacturers that implement a subset of the features required of a complete IrFM-enabled device.

#### 3.1.3 Test Labs

Test labs are independent organizations that have been approved by the IrDA to grant IrFM Qualification to a manufacturer's product. Test labs are expected to maintain test equipment, software, or other tools that allow them to validate a manufacturer's claim of product qualification. A list of Test Labs is available on the IrDA website ([www.irda.org](http://www.irda.org)).

They may also provide additional testing and consulting services to manufacturers. These services are outside the scope of this document.

The test lab that performs the qualification must not be part of the same company that manufactures the product to be qualified.

#### 3.1.4 IrFM Evaluation Team

The IrFM Evaluation Team oversees the implementation of the IrFM Qualification Program. This includes maintenance of Program documentation, managing Test Lab application and review processes, review and approval of waiver requests, and other activities as defined by this document.

#### 3.1.5 IrFM SIG

The IrFM SIG is responsible for technical specification maintenance. When a waiver request is approved by the IrFM Evaluation Team, the IrFM SIG should consider modification of technical specifications to prevent the need for future waivers.

#### 3.1.6 Key Documents

The following documents are used throughout the IrFM Qualification Program.

## **Protocol/Profile Specifications**

Certain specifications affect the behavior required of an IrFM Qualified component. Although these specifications define the general behaviors expected of a component, the test specification defines how device behavior is actually evaluated.

The following protocol and profile specifications are used to evaluate an IrFM component include:

- Infrared Financial Messaging Point and Pay Profile
- Object Exchange Protocol (IrOBEX)
- Tiny TP: A Flow-Control Mechanism for use with IrLMP
- Link Management Protocol (IrLMP)
- Serial Infrared Link Access Protocol (IrLAP)
- Serial Infrared Physical Layer Specification (IrPHY)

## **Test Specifications**

These specifications define the tests used to evaluate a component's compliance with IrFM requirements. However, where a test specification lacks detail, the protocol or profile specifications are normative.

The following documents are used to define the required tests:

- Serial Infrared Protocol Layer Test Guidelines *version 1.0*
- Serial Infrared Physical Layer Test Specification *version 0.3*
- OBEX Test Specification *version 1.0*
- Infrared Financial Messaging Test Specification *version 1.0*

If a test specification for a particular layer is not available at the time of qualification, the manufacturer of the component must affirm compliance to the relevant protocol specification.

## **Program Reference Document**

This document is the Program Reference Document (PRD). It references or defines all aspects required to implement the qualification program, including documentation, processes, procedures, etc. In some cases, this document defers to the processes already defined in the *IrReady Program Reference Document*.

## **Qualification Report**

When filing for official IrFM Qualification, the qualifying test lab must submit a complete qualification report to the IrDA. This report will be made available at the IrDA's public web site and include the following information for each listing:

- The manufacturer's name, product name, version number, and a brief description.
- An "implementation conformance statement" (ICS) that lists all optional features defined by the OBEX and IrFM layers, and indicates whether the feature is supported or unsupported. The list of optional features is identified in the relevant test specification. For example, the mandatory or optional roles, services, transactions, and primitives are defined in [IrFM Test].
- A list of the dates and version numbers of all protocol, profile, and test specifications applied during qualification.
- A list of all tests executed as part of the qualification, including the results of the test (pass, fail, or inconclusive).
- For each failed or inconclusive test, either sufficient documentation describing the reasons that a test does not apply to the platform, or a request for a qualification waiver. (A waiver indicates that the manufacturer's implementation cannot pass a required test, and that the manufacturer believes that the test or core specification is in error.)
- An affirmation that the component complies with all applicable requirements of the protocol and profile specifications, signed by a representative of the manufacturer.
- An affirmation that all tests were run as documented, signed by a representative of the test lab.

The IrDA provides a qualification report template for use by manufacturers and test labs.

### **3.1.7 IrDA Office**

The IrDA is the owner of any association trademarks, logos and specifications. They are responsible for granting any licenses required to use the "IrFM Qualification" branding.

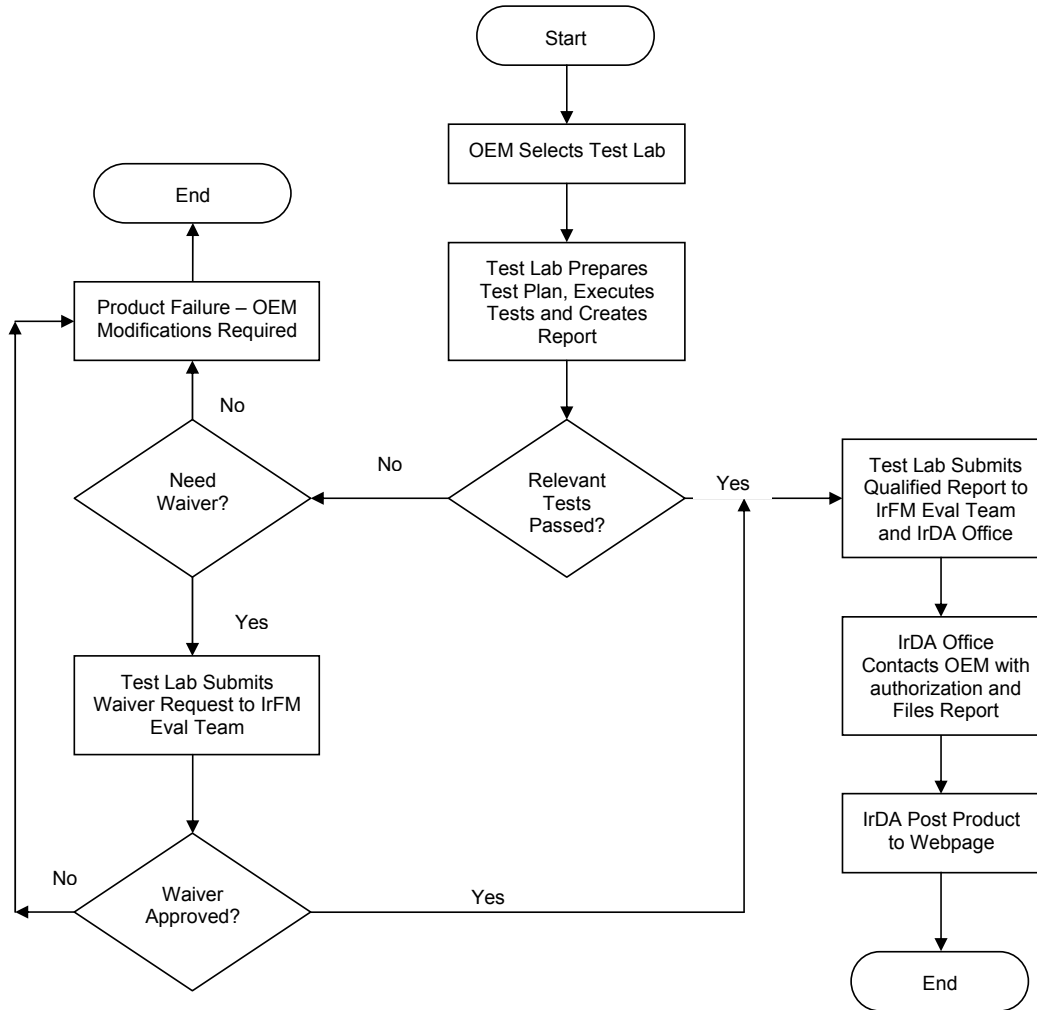
### 3.2 **Qualification Process**

This section defines each step in the qualification process.

The table below provides a summary of the entities involved and the roles they perform.

	<b>Preparation</b>	<b>Testing</b>	<b>Submission/Approval</b>
<b><u>Member</u></b>	Product Development Test Planning Engineering testing	Conduct In house tests Secure Test Lab Create Test Plan	N/A
<b><u>IrFM Test Lab</u></b>	Test Planning w/member Qualification Requirements Review	Conduct Tests Generate Reports Resource for consulting after results	Submit waivers to IrFM SIG Work with OEM on waivers that are not accepted Approve final qualification report Submit completed qualification report to IrDA Staff
<b><u>IrFM Evaluation Team</u></b>	approve Test Labs	Maintain test procedures Oversee program	Approve or Deny Waiver requests
<b><u>IrFM SIG</u></b>	N/A	Maintains test specification Resolves Errata	
<b><u>IrDA Office</u></b>	N/A	N/A	Validates Member status Issues License Post qualified product info to public web site Collects listing fees

The following flow chart illustrates the process graphically:



### 3.2.1 Development of the Test Plan

It must be clear which features are supported for a given implementation under test (IUT). Within IrFM, these features are categorized as follows (from most general to most detailed):

- *Roles* are PTD or POS. Each role carries different mandatory and optional service requirements.
- *Services* define the set of transactions that a POS or PTD may use. Services may be either mandatory or optional, depending on the IUT's role.
- *Transactions* define the set of primitives used to accomplish a specific action. Transactions are mandatory or optional depending on the IUT's role and whether the transaction's service is implemented.
- *Primitives* are individual OBEX operations (GET or PUT). Primitives are mandatory or optional depending on the IUT's role and whether any transactions that refer to the primitive are implemented.

In addition, IrFM specifies mandatory or optional features within the OBEX protocol layer. These requirements exceed the minimum mandatory features specified within OBEX. Support for layers below OBEX, including Tiny TP, IrLMP, IrLAP, and the infrared physical layer, are also required.

Therefore, to determine a test plan, the test lab must develop an "implementation conformance statement" (ICS), which is a complete list of the features that the IUT implements or does not implement, including roles, services, transactions, primitives, OBEX features, and underlying IrDA protocol features.

With the ICS in hand, the test lab can then determine which tests need to be executed. In the OBEX and IrFM test specifications, the "test condition" section included with each test case indicates explicitly which feature(s) must be supported for the test to be applicable. If a feature is not supported by the IUT, any corresponding test is considered "inapplicable". Inapplicable tests need not be executed or listed in the final qualification report.

Any applicable test for an optional or mandatory feature that is supported by the IUT must be executed and its results reported.

### 3.2.2 Test Execution

The test lab, not the manufacturer, produces the final qualification report. The manufacturer is free to run the tests in preparation but test results used for qualification purposes must be executed directly by the test lab. [[note: this is redundant, section 3.1.3 lists this requirement already]]

The IrFM Evaluation Team maintains a list of approved test tools that may be used to reproduce required tests. However, the specifics of the test environment are left to the test lab and manufacturer's discretion as long as the environment can be used to:

- Re-create the procedure as required by the test case
- Produce a report sufficient to determine whether a pass verdict is reached

At the time of test execution, the test lab must use the most recent published versions of test specifications. If more than three months elapse between test execution and report submission and the test specifications have been updated during that time, any new or updated tests must be executed according to the latest test specifications.

If any test fails, the test lab has several options:

- First, the test lab may modify the test execution environment, but only within the limits of the test specification. For example, it may be necessary to set up device-specific "preconditions" to cause a POS device to behave in the manner required by the test.
- Second, the test lab may refer problems back for the manufacturer to address.
- Third, if test lab believes that the device should be considered compliant regardless of a specific failure, they may work with the manufacturer to generate a waiver request to be reviewed by the IrFM Evaluation Team.

The result of the Test Execution process is a complete qualification report, including all details as described in section 3.1.6.

### 3.2.3 Submission and Approval

Once the test lab has completed and approved the qualification report, the entire report is submitted to the IrDA staff. If the report contains a request for a waiver, the Evaluation Team will have two weeks to vote on whether the waiver is valid (allowing the product to be qualified) or invalid. Voting will be conducted according to policies internally adopted by the Evaluation Team. In the absence of a response, it will be assumed that the waiver is accepted. When a waiver is accepted, the IrFM SIG is responsible for posting errata that rectify any problems in the technical or test specifications.

If any waiver request is denied, the submission is referred back to the test lab for resolution with the manufacturer. A manufacturer who encounters a problem during the qualification process, but wishes to avoid a waiver vote, is advised to submit errata through the IrFM SIG prior to submitting a qualification report.

If a qualification report contains no waivers or its waivers are approved, the IrDA will post the full report on its public website and indicate that the IUT is approved as a qualified IrFM implementation.

Fees are required by the IrDA organization to list a product or update a product listing. Contact an IrDA representative or check the IrDA web site ([www.irda.org](http://www.irda.org)) for the latest fee schedule. These fees include product listing only; test labs will independently charge additional consulting fees to create and approve a qualification report.

This chapter describes special aspects of the IrFM Qualification Program.

### 4.1 **Information Disclosure**

In some cases, a manufacturer may not wish to publicly disclose information regarding an upcoming product that a qualification report would reveal. If this is the case, the product cannot be qualified using the IrFM program, which is intended to provide exposure for products that meet IrFM qualification criteria.

### 4.2 **IrFM Components**

The IrFM Qualification Program recognizes both complete implementations and components. By definition, an IrFM component does not implement all required protocol layers or features. In this case, tests for features that the component does not claim to support are considered inapplicable and need not be listed. The qualification report must make it clear that the product is intended as a component.

#### 4.2.1 **Pre-tested components**

When a qualified IrFM component is utilized in a new IrFM component or implementation, it is considered a “pre-tested component”. If all of the following are true, certain test cases do **not** need to be re-executed at the discretion of the test lab:

- The pre-qualified component is not modified by its inclusion into the new product.
- The test case’s specification has not been modified since its original execution during the component’s qualification process.
- Pertinent details (vendor name, product name, and version number) of the pre-qualified component or components are included with the new product’s qualification report.
- The new product’s qualification report indicates test cases that were “pre-tested” instead of having been re-executed in the new product.

### 4.3 **Re-submission**

A new version of a qualified IrFM component or implementation must be re-submitted to a test lab in the following circumstances:

- The new version incorporates different pre-tested components than previously documented in a qualification report.
- The new version supports a different set of optional or required features.
- The new version undergoes an internal revision that affects its IrFM implementation.

Once submitted, the test lab determines whether a retest is required. If so, all applicable tests are re-executed by the test lab as described in section 3.2.2 and a new qualification report is generated and posted.

In the case that a manufacturer markets an IrFM-capable product with a new name or model number, it must submit the new product to a test lab for review. If the product is similar from a technical perspective, the existing listing may be updated to include a reference to the new product name or model number. If the product is substantially different, a new listing is required. The qualifying test lab makes this determination.

### 4.4 **Specification Updates**

Once a product has received IrFM qualification, it is recognized as “IrFM Qualified” in perpetuity, regardless of subsequent specification revisions. However, if any retesting due to resubmission is required, the retesting must be performed using the latest specifications.

A product’s qualification may be “updated” by testing only against applicable tests that have been changed or updated since previous test specification revisions. In this case, an abbreviated qualification report may be posted, updating the previous qualification listing to indicate compliance with the most recent specifications.