The ATM Forum
Technical Committee

# PICS Proforma for the 155 Mb/s over Twisted Pair Cable Physical Medium Dependent Interface

**af-test-0070.000**

**November, 1996**

**PICS Proforma for the 155 Mb/s over Twisted Pair Cable**
**Physical Medium Dependent Interface**

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# Contents

# 1. Introduction

Prior to the conformance testing and the interoperability testing of IUTs, it is necessary to have the PICS (Protocol Implementation Conformance Statement) documents for both implementations.

This particular PICS deals with the implementation of the 155 Mb/s Twisted Pair Cable Physical Layer Interface for UTP-5.

## 1.1 Scope

This document provides the PICS proforma for the 155 Mb/s Twisted Pair Cable Physical Layer Interface as described in the ATM Physical Medium Dependent Interface Specification for 155 Mb/s over Twisted Pair Cable [1] and the Addendum to the ATM Physical Medium Dependent Interface Specification for 155 Mb/s [2], in compliance with the relevant requirements, and in accordance with the relevant guidelines, given in ISO/IEC 9646-2 [3].

## 1.2 Normative References

[1] af-phy-0015.000, "ATM Physical Medium Dependent Interface Specification for 155 Mb/s over Twisted Pair Cable", September, 1994.

[2] af-phy-0053.000, "Addendum to ATM Physical Medium Dependent Interface Specification for 155 Mb/s over Twisted Pair Cable", January, 1996.

[3] ISO/IEC 9646-2 1990, Information technology - Open systems inter-connection - Conformance testing methodology and framework - Part 2: Abstract test suite specification. (See also ITU-TS Recommendation X.290 (1991)).

[4] ANSI/TIA/EIA-568-A, "Commercial Building Telecommunications Cabling Standard," October 6, 1995.

[5] ISO/IEC 11801, "Generic Cabling for Customer Premises", 1995.

[6] The ATM Forum Technical Committee, ATM User Network Interface Specification, Version 3.1, Prentice Hall, Englewood Cliffs, NJ, 1994.

[7] ISO 8877, "Informational processing systems, Interface connector and contact assignments for ISDN basic access interface located at reference points S and T.," August 15, 1987.

[8] ANSI EIA/TIA 574, "9 Position Non-Synchronous Interface between DTE and DCTE employing Serial Binary Data Interchange," 1990.

[9] IEC 603-7, “Connectors for frequencies below 3 MHz for use with printed boards, Part 7: detailed specification for connectors 8 way, including fixed and free connectors with common mating feature”.

## 1.3 Definitions

| | |
|---|---|
| ATM | Asynchronous Transfer Mode |
| HEC | Header Error Control |
| IUT | Implementation Under Test |
| LOS | Loss of Signal |
| M | Mandatory |
| MIC | Medium Interface Connector |
| O | Optional |
| O.<n> | Optional, but, if chosen, support is required for either at least one or only one of the options in the group labeled by the same numeral <n> |
| P | Prohibited |
| PDU | Protocol Data Unit |
| PMD | Physical Media Dependent |
| S.<i> | Supplementary information number i |
| SAR | Segmentation and Reassembly (Sublayer) |
| SDU | Service Data Unit |
| SPE | SONET Synchronous Payload Envelope |
| TC | Transmission Convergence |
| UTP-5 | Category 5 Unshielded Twisted-Pair |
| X.<i> | Exceptional information number i |

## 1.4 Conformance Statement

The supplier of a protocol implementation which is claimed to conform to the 155 Mb/s Twisted Pair Cable Physical Layer Interface over UTP-5 is required to complete a copy of the PICS proforma provided in Section 3 and is required to provide the information necessary to identify both the supplier and the implementation.

# 2. Identification of the Implementation

## Implementation Under Test (IUT) Identification

IUT Name: ______________________________

______________________________

IUT Version: ______________________________

______________________________

## System Under Test

SUT Name: ______________________________

______________________________

Hardware Configuration: ______________________________

______________________________

______________________________

Operating System: ______________________________

## Product Supplier

Name: ______________________________

Address: ______________________________

______________________________

Telephone Number: ______________________________

Facsimile Number: ______________________________

E-mail Address (optional):______________________________

Additional Information: ______________________________

## Client

Name: ______________________________________________________________________

Address: ____________________________________________________________________

_________________________________________________________________________

Telephone Number: _________________________

Facsimile Number: _________________________

Additional Information: _______________________________________________________

## PICS Contact Person

Name: ______________________________________________________________________

Address: ____________________________________________________________________

_________________________________________________________________________

Telephone Number: _________________________

Facsimile Number: _________________________

Additional Information: _______________________________________________________

## PICS PICS-System Conformance Statement

Provide the relationship of the PICS with the System Conformance Statement for the system:

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

## Identification of the protocol

This PICS proforma applies to the following documents:

af-phy-0015.000, "ATM Physical Medium Dependent Interface Specification for 155 Mb/s over Twisted Pair Cable", September, 1994 and af-phy-0054.000, “Addendum to ATM Physical Medium Dependent Interface Specification for 155 Mb/s over Twisted Pair Cable”.

# 3. PICS Proforma

## 3.1 Global Statement of Conformance

The implementation described in this PICS meets all of the mandatory requirements of the reference protocol.

___Yes

___No

Note: Answering "No" indicates non-conformance to the specified protocol. Non-supported mandatory capabilities are to be identified in the following tables, with an explanation in the comments section of each table of why the implementation is non-conforming.

## 3.2 Instructions for Completing the PICS Proforma

The PICS Proforma is a fixed-format questionnaire. Answers to the questionnaire should be provided in the rightmost columns, either by simply indicating a restricted choice (such as Yes or No), or by entering a value or a set of range of values.

A supplier may also provide additional information, categorized as exceptional or supplementary information. This additional information should be provided as items labeled X.<i> for exceptional information, or S.<i> for supplemental information, respectively, for cross reference purposes, where <i> is any unambiguous identification for the item. The exceptional and supplementary information is not mandatory and the PICS is complete without such information. The presence of optional supplementary or exception information should not affect test execution, and will in no way affect interoperability verification.

## 3.3 Physical Media Dependent (PMD) Specification

| Item | Protocol Feature | Status Predicate | Specification Reference | Support |
|---|---|---|---|---|
| 3.3.1 | Does the IUT implement the ISO/IEC 603.7[9] Media Interface Connector meeting the requirements of Chapter 10 ANSI/TIA/EIA-568-A[4]? | O.1 | 5.1.8, 607.3[2] | Yes__ No__ X__ S__ |
| 3.3.2 | Does the IUT implement the category 5 Media Interface Connector for 120 Ohms meeting the requirements of ISO/IEC 11801[5]? | O.1 | 5.3.5[2] | Yes__ No__ X__ S__ |
| 3.3.3 | Does the IUT implement the STP Media Interface Connector meeting the requirements of ANSI/TIA/EIA-568-A[4], Section 11? | O.1 | 5.2.4 | Yes__ No__ X__ S__ |
| 3.3.4 | Does the IUT implement the optional 9-pole D-Shell Active Interface Connector meeting the requirements of EIA/TIA 574:1990[8] Section 2? | O | 5.2.5.1 | Yes__ No__ X__ S__ |
| 3.3.5 | Does the bit stream of the PMD interface of the IUT have an external frame based upon the SONET STS-3c frame as defined in the ATM Forum UNI Specification 3.1, Section 2.1? | M | 2.1 | Yes__ No__ X__ S__ |
| 3.3.6 | Does the IUT transmitter conform to the encoded line rate requirement of 155.52 Mbaud +/-20 ppm? | M | 2.1 | Yes__ No__ X__ S__ |
| 3.3.7 | If the IUT is a “user device”, does the IUT use a transmit clock which is derived from its received line signal? | M | 2.1 | Yes__ No__ X__ S__ |
| 3.3.8 | If the IUT is a “user device”, in the absence of a valid clock derived from the received line signal, does the IUT use a free-running transmit clock that operates at 155.52 MHz +/-100 ppm? | M | 2.1 | Yes__ No__ X__ S__ |
| 3.3.9 | Does the IUT transmitter utilize NRZ line coding? | M | 2.2 | Yes__ No__ X__ S__ |
| 3.3.10 | Does the IUT transmitter waveform conform to the output voltage, waveform overshoot and rise/fall time requirements? | M | 3.2, 3.3, 3.5 | Yes__ No__ X__ S__ |
| 3.3.11 | Does the IUT transmitter conform to the return loss requirements? | M | 3.4 | Yes__ No__ X__ S__ |
| 3.3.12 | Does the IUT transmitter conform to the duty cycle distortion requirements? | M | 3.6 | Yes__ No__ X__ S__ |
| 3.3.13 | If the IUT is “network equipment”, does the IUT transmit jitter not exceed 1.5 ns peak to peak? | M | 3.7 | Yes__ No__ X__ S__ |
| 3.3.14 | If the IUT is “user device”, does the IUT transmit jitter not exceed 2 ns peak to peak? | M | 3.7 | Yes__ No__ X__ S__ |
| 3.3.15 | Does the IUT transmitter conform to the baseline wander requirements? | M | 3.8 | Yes__ No__ X__ S__ |
| 3.3.16 | Does the IUT receiver return loss conform to the requirements? | M | 4.2 | Yes__ No__ X__ S__ |
| 3.3.17 | Does the IUT receiver conform to the input jitter tolerance requirement? | M | 4.4 | Yes__ No__ X__ S__ |
| 3.3.18 | Will the IUT achieve the BER of $10^{-10}$ under the conditions specified? | O.2 | 2.3, 5.1.1, 5.3.1 | Yes__ No__ X__ S__ |
| 3.3.19 | Will the IUT achieve the BER of $10^{-10}$ under the conditions specified? | O.3 | 2.3, 5.2.1, 5.3.1 | Yes__ No__ X__ S__ |

| Item | Protocol Feature | Status Predicate | Specification Reference | Support |
|---|---|---|---|---|
| 3.3.20 | Will the IUT achieve the BER of $10^{-10}$ under the conditions specified? | O.4 | 2.3, 5.3.1[2], 5.3.1[1] | Yes__ No__ X__ S__ |
| 3.3.21 | Does the IUT receiver meet the common-mode rejection requirement? | M | 4.3 | Yes__ No__ X__ S__ |
| 3.3.22 | Does the IUT Active Output Interface represent a logical ONE by a positive voltage on the TX+ pin with respect to the TX- pin and a logical ZERO by a positive voltage on the TX- pin with respect to the TX+ pin ? | M | 3. | Yes__ No__ X__ S__ |
| 3.3.23 | Does the IUT Active Input Interface decode a logical ONE when it detects a positive voltage on the RX+ pin with respect to the RX- pin and a logical ZERO when it detects a positive voltage on the RX- pin with respect to the RX+ pin ? | M | 4.1 | Yes__ No__ X__ S__ |
| Comments:<br>O.1 = The IUT must support at least one of these features<br>O.2 = If the IUT operates over 100 ohm UTP link segment, it must meet BER requirement under these conditions<br>O.3 = If the IUT operates over 150 ohm STP link segment, it must meet BER requirement under these conditions<br>O.4 = If the IUT operates over 120 ohm copper link segment, it must meet BER requirement under these conditions | | | | |

## 3.4 Transmission Convergence (TC) Sublayer Functions

| Item | Protocol Feature | Status Predicate | Specification Reference | Support |
|---|---|---|---|---|
| 3.4.1 | Does the IUT conform to the Transmission Convergence specification as defined for the private UNI in the ATM Forum Technical Committee ATM UNI Specification, Version 3.1, Section 2.1? | M | 1.2 | Yes__ No__ X__ S__ |
| Comments: | | | | |