PIV Card Test Procedure
VERSION **3.0.0**

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1 Overview

Homeland Security Presidential Directive-12 (HSPD-12) - "*Policy for a Common Identification Standard for Federal Employees and Contractors*" directed the promulgation of a new Federal standard for a secure and reliable form of identification issued by all Federal Agencies to their employees and contractors.

In addition to derived test requirements developed to test conformance to the NIST standard, GSA has established interoperability and performance metrics to further determine product suitability. Vendors whose products and services are deemed to be conformant with NIST standards and the GSA interoperability and performance criteria will be eligible to sell their products and services to the Federal Government.

1.1 Identification

This document provides the detailed test procedure that needs to be executed by the Lab in order to evaluate the PIV Card (henceforth referred to as the Product) against the subset of applicable requirements that need to be electronically tested for this category.

2   Testing Process

As previously mentioned, this document prescribes detailed test steps that need to be executed in order to test the requirements applicable for this category. Please note that conformance to the tests specified in this document will not result in the Product being compliant to the applicable requirements of FIPS 201. The Product must undergo an evaluation using all the evaluation criteria listed for that category prior to being deemed as compliant. Only products and services that have successfully completed the entire Approval Process will be designated as conformant to the Standard. To this effect, this document only provides details for the evaluation using the Lab Test Data Report approval mechanism.

A Lab Engineer follows the steps outlined below in order to test those requirements that have been identified to be electronically tested. The end result is a compilation of the observed behavior of the Product in the Lab Test Data Report.

Section 3 provides the test procedures that need to be executed for evaluating the Product as conformant to the requirements of FIPS 201.

3 Test Procedure for PIV Card

3.1 Requirements

The following table provides a reference to the requirements that need to be electronically tested within the Lab as outlined in the Approval Procedures document for the Product. The different test cases that are used to check compliance to the requirements is also cross-referenced in the table below.

Identifier #	Requirement Description	Source	Test Case #
PIV-C.19	Cards shall not malfunction after hand cleaning with a mild soap and water mixture.	FIPS 201, Section 4.1.3	PIV-C-TP.1
PIV-C.20	The reagents called out in Section 5.4.1.1 of [ISO10373] shall be modified to include a two percent soap solution.	FIPS 201, Section 4.1.3	PIV-C-TP.1
PIV-C.24	The card material shall allow production of a flat card in accordance with [ISO7810] after lamination of one or both sides of the card.	FIPS 201, Section 4.1.3	PIV-C-TP.2
PIV-C.57	At a minimum, PIV Cards shall support either the T=0 or T=1 transmission protocol as defined in ISO/IEC 7816-3:1997. The card may support both protocols	Card /Card Reader Interoperability Requirements, Section 2.1.1.3	PIV-C-TP.3
PIV-C.58	PIV Cards shall not require the use of any RFU bits in the Global or Specific Interface Bytes to operate correctly.	Card /Card Reader Interoperability Requirements, Section 2.1.1.4	PIV-C-TP.3
PIV-C.59	Retrieval time of the CHUID through the contactless interface of the card shall not exceed 1.0 seconds.	Card /Card Reader Interoperability Requirements, Section 3.1.1.1	PIV-C-TP.4
PIV-C.60	Retrieval time of the biometric fingerprints through the contact interface of the card shall not exceed 1.0 seconds.	Card /Card Reader Interoperability Requirements, Section 3.1.2.1	PIV-C-TP.3
PIV-C.62	PIV cards shall support the Class A operating class as defined in ISO/IEC 7816-3:1997 and ISO/IEC 7816-3:1997/Amd 1:2002.	Card /Card Reader Interoperability Requirements	PIV-C-TP.3
PIV-C.63	PIV Cards submitted for testing shall have the	Derived Test	PIV-C-TP.3

Identifier #	Requirement Description	Source	Test Case #
	biometric fingerprint buffer populated, which has been retrieved from the EP Website.	Requirement	
PIV-C.64	PIV Cards submitted for testing shall have the CHUID available, on the contactless ICC, which has been retrieved from the EP Website.	Derived Test Requirement	PIV-C-TP.4
PIV-C.73	At a minimum, the PIV Card shall support either the Type A or Type B transmission protocols as defined in ISO/IEC 14443-4:2001.	Card /Card Reader Interoperability Requirements, Section 2.2.1.3	PIV-C-TP.4

Table 1 - Applicable Requirements

3.2   Test Components

Table 2 provides the details of all the components required by the Lab to execute this test procedure. Based on the different test cases, different components may be required to execute different test cases.

#	Component	Component Details	Identifier
1	The Card Reader Test Fixture	Includes a Workstation with the Card Reader Test Application installed and operational.	HOST
2	Breakout Box	A device that converts Wiegand data output into serial output for input into the Card Reader Test Application, running on the Host System.	BREAKOUT
3	Contact Card Reader	Gemalto GemPC Twin USB HW111459A	CREADER
4	Contactless Card Reader	Integrated Engineering SmartLogon Pro 01SMR-4120	CLREADER
5	1 Gallon Bucket or Container	-	BUCKET
6	1 Tablespoon	-	TABLESPOON
7	A liquid Measuring Cup	-	CUP
8	Water	-	WATER
9	Mild Dish Soap	e.g. Dawn, Pamolive, Joy	SOAP
10	Paper Towels	-	TOWEL

Table 2 - Test Procedure: Components

3.3 Test Cases

This section discusses the various test cases that are needed to test the Product against the requirements mentioned above.

3.3.1 Test Case PIV-C-TP.1

3.3.1.1 Purpose

The purpose of this test is to verify that the card does not malfunction after hand washing the card in a soap and water solution. The test will also verify that the card does not delaminate after washing.

3.3.1.2 Test Setup

Equipment:	The following components are necessary for executing this test case: • BUCKET • CUP • TABLESPOON • CUP • TOWEL • SOAP • WATER • PROD • HOST
Preparation:	• Measure eight (8) CUPS of lukewarm WATER and pour into BUCKET. • Measure three (3) TABLESPOONS of SOAP and pour into BUCKET • Mix the solution for approximately 30 seconds.

3.3.1.3 Test Process

Test Steps:	1. Execute the Test Application on the HOST. 2. Select the "PIV Card" tab in the Test Application. This selects the test for the PIV Card 3. Fill in all the PIV Card Product Information as required in the screen. 4. Hand-wash the PROD by gently rubbing it while it is submerged in the soapy water solution. Wash for approximately 1 minute. 5. Using TOWEL, pat the PROD completely dry. 6. Allow remaining moisture to evaporate by letting the card air out for 10 minutes. 7. Examine the lamination on the PROD. 8. Enter any observations in the edit box for the R-PIV-C-TP.1 test case.
Expected Result(s):	1. The test completes successfully showing that the Product does not delaminate after washing it in a mild solution of soap and water.

	* NOTE: - Test results whether the Product malfunctions will be documented based on the results of PIV-C.57 (PIV-C-TP.3) and PIV-C-TP.4.

Test Case PIV-C-TP.2

3.3.1.4 Purpose

The purpose of this test is to verify that the production of the card has resulted in a flat card in accordance with [ISO7810] after lamination of one or both sides of the card.

3.3.1.5 Test Setup

Equipment:	The following components are necessary for executing this test case: ▪ PROD
Preparation:	▪ No preparation is necessary for this scenario.

3.3.1.6 Test Process

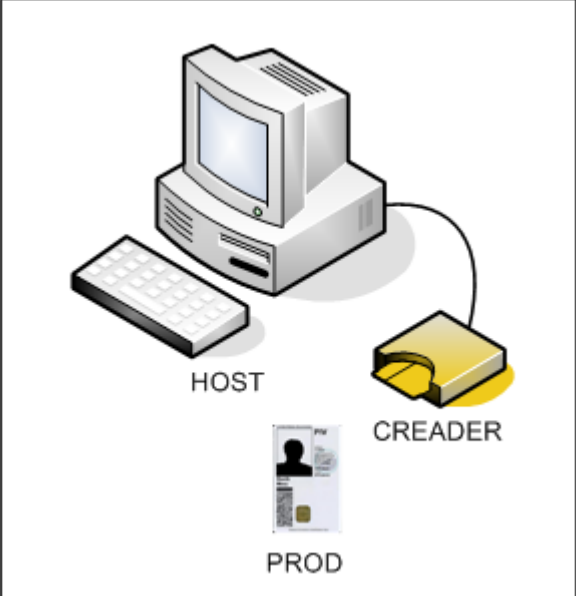| **Test Steps:**	1. Select the Test Case radio button corresponding to PIV-C-TP.2. 2. Examine each of the five sample laminated cards submitted for evaluation. Look for bending, bowing, or warping of the card, specifically around the gold contact. Lay the cards on a flat surface on each side to determine if there is a significant amount of bending or bowing in the card (>2mm) 3. Verify whether the cards submitted seem to visually be in good condition, that no debris is under the card surface and the lamination is not cracking or peeling. 4. Enter any observations in the edit box for the R-PIV-C-TP.2 test case.
Expected Result(s):	1. The Lab Engineer reports that the laminated PIV Cards submitted are flat and in good condition.

3.3.2 Test Case PIV-C-TP.3

3.3.2.1 Purpose

The purpose of this test is to verify the contact-based interoperability requirements for the PIV Card. More specifically the test verifies the following:

  i. The PIV Card supports either the T=0 or T=1 transmission protocol as defined in ISO/IEC 7816-3:1997.
  ii. The PIV Card supports the Class A operating class as defined in ISO/IEC 7816-3:1997 and ISO/IEC 7816-3:1997/Amd 1:2002
  iii. The PIV Card requires the use of any RFU bits in the Global or Specific Interface Bytes to operate correctly.

iv. The retrieval time for the fingerprint biometric through the contact interface of the card does not exceed 1.0 seconds.

v. The data retrieved through the contact interface is identical to the data that was expected to be received.

3.3.2.2 Test Setup

Equipment:	The following components are necessary for executing this test case: ▪ HOST ▪ PROD ▪ CREADER
Configuration Diagram:	 **Figure 1 - Configuration Diagram for Test Case PIV-C-TP.3**
Preparation:	▪ Connect the CREADER in the appropriate port of the HOST ▪ Verify that the CREADER is correctly installed by reviewing its presence in list of hardware using the device manager of the host system. ▪ Ensure that the hexadecimal representation of the data downloaded from the EP website (http://fips201ep.cio.gov/documents/aplData.zip), has been entered into the configuration file `expectedValues.PIV-C.properties`. ▪ Ensure that the downloaded biometric fingerprint information is populated on the PROD.

3.3.2.3 Test Process

Test Steps:	1. Ensure that the details of CREADER are entered into the Test Application under File → Edit Reference Reader Implementation Info. 2. Select the Test Case radio button corresponding to Test Case

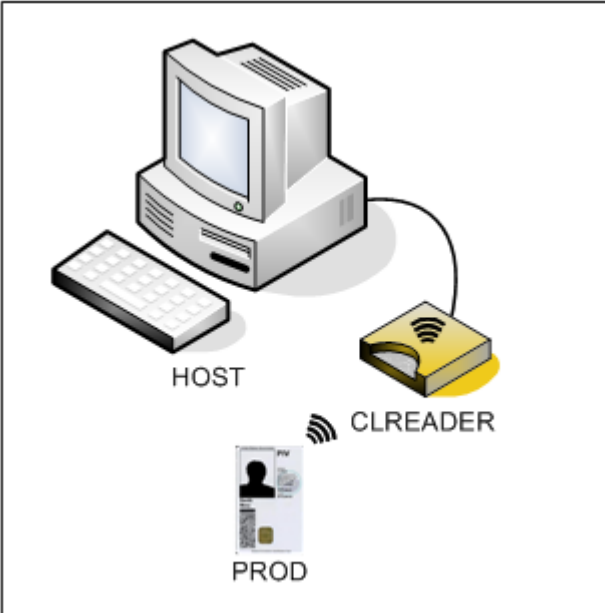|	
	PIV-C-TP.3. 3. Click on the "Execute Test" button. Follow the steps on the screen. 4. Verify that the test was completed by reviewing the result on the screen.

Expected Result(s):	1. The test completes successfully showing that:
	    ▪ The PIV Card supports either the T=0 or T=1 transmission protocol as defined in ISO/IEC 7816-3:1997.
	    ▪ The PIV Card supports the Class A operating class as defined in ISO/IEC 7816-3:1997 and ISO/IEC 7816-3:1997/Amd 1:2002
	    ▪ The PIV Card does not use any RFU bits in the Global or Specific Interface Bytes to operate correctly.
	    ▪ The retrieval time for the fingerprint biometric through the contact interface of the card does not exceed 1.0 seconds.
	    ▪ The data that was retrieved from the card matches the data that was expected to be retrieved.
	
	* Note: If PIV-C-TP.3 and PIV-C-TP.4 complete successfully, it is an indication that PIV-C-TP.1 has also passed. The washing of the PROD using the soap solution did not affect the ICC of the PIV Card and it functions as designed.

3.3.3   Test Case PIV-C-TP.4

3.3.3.1 Purpose

The purpose of this test is to verify the contactless interoperability requirements for the PIV Card. More specifically, the test verifies the following:

▪ The retrieval time for the CHUID data through the contactless interface of the card does not exceed 1.0 seconds.

3.3.3.2 Test Setup

Equipment:	The following components are necessary for executing this test case:
	    ▪ HOST
	    ▪ PROD
	    ▪ CLREADER

Configuration Diagram:	
	Figure 2 - Configuration Diagram for Test Case PIV-C-TP.4
Preparation:	▪ Connect the CLREADER into the appropriate port in the breakout box of the HOST. ▪ Verify that the CLREADER is correctly installed by reviewing its presence in list of hardware using the device manager of the host system. ▪ Ensure that the downloaded CHUID data is populated on the PROD.

3.3.3.3 Test Process

Test Steps:	1. Make sure that the details of CLREADER are entered into the Test Application using the File → Edit Reference Reader Implementation Info. 2. Select the Test Case radio button corresponding to Test Case PIV-C-TP.4. 3. Click on the "Execute Test" button. Follow the steps on the screen. 4. Verify that the test was completed by reviewing the result on the screen.

Expected Result(s):	1. The test completes successfully for showing that:
	   ▪ The retrieval time for the CHUID data through the contactless interface of the card does not exceed 1.0 seconds.
	   ▪ The data that was retrieved from the card matches the data that was expected to be retrieved.
	
	 * Note: If PIV-C-TP.3 and PIV-C-TP.4 complete successfully, it is an indication that PIV-C-TP.1 has also passed. The washing of the PROD using the soap solution did not affect the ICC of the PIV

	Card and it functions as designed.