1. **Test Procedures for the Discrete Device Library** 
   1. **Overview**

These tests verify the functionality of the Discrete Device library.

There is only one important Discrete GPIA Card character: direction.

Here we use the Test programs to test the Discrete Device Library. Meanwhile the multimeter and oscilloscope may be used as well. After the test program step by step verified by observer, the test log files can be generated and saved for delivering.

* 1. **Function Tested:**

Use the Test programs to test the GPIA Discrete Device Library.

The device library function in fact contains Channel Modes Test/ Data Tests/ Operation Tests/Error /others:

1. Mode tests: Null
2. Data tests: In-Port data test and Out-Port data test.
3. Operation tests: Null.
4. Error log tests:
5. Other tests: Multi-channel and devices/ records tests

The GPIA hardware allows the output and input port connected directly, as the voltage value is consistence with each other.

* 1. **Test Procedures**
     1. **Discrete data In-Out put test**

To test this function, a single card is enough; following is the configuration and data flow chart. All the following tests until the Multi-device function tests are based on this hardware configuration.



**Picture1. Single card test data flow**

* + - 1. **Objective:**

In current the data (long messages) can be transmitted and received correctly.

* + - 1. **Methods:**

Run the Test Program (choosing the Test procedure ‘TestData\_In\_Out’ in the console window) step by step and observes results. Steps: following the auto-test program

* + - 1. **Expected Results:**

All the following requirements are passed at the observer’s running and operation of the test program. The test log file will be saved as provident. The device opened and closed, as well as the data recording functions are also tested here.

Requirements: DISDEV\_28 [Open device], DISDEV\_27 [data logged], DISDEV\_33 [data start logging] DISDEV\_45 [Configure Output Port], DISDEV\_31 [Send out data] DISDEV\_30 [Configure Input Port], DISDEV\_36 [Data reading], DISDEV\_35 [stop logging], DISDEV\_32 [Close device]

* + 1. **Multi-channels/devices Test**

Preparation: two cards connected with the PC through net, and following is data flow of the multi-card test.

  
**Picture2. Multi-cards test data flow**

* + - * 1. **Objective:**

Verify that all the bits on the two devices can TX and RX bit data correctly.

* + - * 1. **Methods**

Run the Test Program (choosing the Test procedure ‘TestMultidevices’ in the console window) step by step and observes results.

* + - * 1. **Expected Results:**

All the following requirements are passed at the observer’s running and operation of the test program. And several of the requirements are partially covered through one test of all the tests. The test log file will be saved as provident.

DISDEV\_23 [Multi-Cards] DISDEV\_24 [Multi-Ports]

* + 1. **Error tests:**

Preparation: keep one device installed or two devices on the PC .The t

* + - 1. **Objective:**

When running the auto test program, the in-correct operations will log an error through the device library.

* + - 1. **Methods**

Run the Test Program (choosing the Test procedure ‘TestErrors’ in the console window) step by step and observes results. Steps: following the auto-test program. It includes the following tests:

1. Open/Close device Error logs.
2. Read/Write device Error logs.
3. Record Error logs.
   * + 1. **Expected Results:**

All the following requirements are passed at the observer’s running and operation of the test program. And several of the requirements are partially covered through one test of all the tests. The test log file will be saved as provident. Requirements to be traced:

DISDEV\_38 (Open error logs) DISDEV\_39 (Close error logs) DISDEV\_40 (not open device, cannot read, error get) DISDEV\_41 (not open device, cannot write, error get) DISDEV\_44 (not open device, cannot record, error get)