



User Manual



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WARNINGS AND CAUTIONS

WARNING - HAZARDOUS ENVIRONMENTS	SYMBOL
This product is not specifically designed for use in hazardous environments, for example in explosive atmospheres. If the product is to be used in hazardous environments we recommend that the user ensures suitable protective measures are taken.	
WARNING - DANGER OF ELECTRIC SHOCK	SYMBOL
<p>This module may contain hazardous voltages. Before removing the module from the rack remove all supplies and disconnect user I/O signals.</p> <p>Unused slots in the PXI/LXI chassis are populated with blanking plates to prevent access to user I/O signals that may be present. Blanking panels are available to order from Pickering in a variety of slot widths. If the product is not used in this manner for example by using an extender card then additional care must be taken to avoid contact with exposed signals.</p>	
CAUTION - HANDLING OF ELECTROSTATIC-SENSITIVE DEVICES	SYMBOL
<p>Certain semiconductor devices used in this equipment are liable to damage due to static voltage. Observe the following precautions when handling these devices in their unterminated state, or sub-assemblies containing these devices:</p> <ol style="list-style-type: none"> 1. Persons removing sub-assemblies from equipment using these devices must be earthed by a wrist strap and a resistor at the point provided on the equipment. 2. Soldering irons used during the repair operations must be low voltage types with earthed tips and isolated from the mains voltage by a double insulated transformer. 3. Outer clothing worn must be unable to generate static charges. 4. Printed Circuit Boards (PCBs) fitted with these devices must be stored and transported in anti-static bags. 	
CAUTION - PRODUCT DOCUMENTATION	SYMBOL
Suitably qualified & trained users should ensure that the accompanying documentation is fully read and understood before attempting to install or operate the product.	

SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS
<p>All cleaning and servicing requires the equipment to be isolated and disconnected from the power source and user I/O signals (refer to the Maintenance Section).</p> <ul style="list-style-type: none"> • Appropriate manual handling procedures should be followed as dictated by the weight of the individual module or the combined weight of the modules & chassis. • Should a fault occur with the module or chassis, immediately isolate and disconnect the incoming power to the chassis and the user I/O signals. • Ensure the equipment is installed, operated and maintained by trained and authorised personnel. • For suitably equipped products in the event of an emergency press the red “emergency stop” button situated on the front of the unit.

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SECTION 1 - INTRODUCTION

The eBIRST tool set allows automated testing of Pickering Interfaces switching systems. The eBIRST tools measure resistance of set paths at the user connection in the open and closed state using four-wire measurements. Based on the results, the tool identifies the relays that may be causing problems and provides a graphical output to indicate their location. The eBIRST tools are designed primarily to find defective relays, in a very small number of circumstances they may indicate failures that are caused by other factors such as a defective relay controls. In these circumstances eBIRST is a significant aid in identifying the origin of these faults.

General Description of eBIRST parts

eBIRST Tool

The eBIRST Tool connects directly to a switching system to be tested or connects via an adapter, it is important that the user makes sure the tool and any required adapter matches the target connector on the switching system.

Adapters are used where the switching system does not use the 200-way LFH, 78-way D-type or 50-way D-type connectors. This includes RF switching systems based on SMB coaxial connectors.

The eBIRST tool has a USB port which connects to the control computer.

In some applications two tools are required to test a switching system because there may be inputs on one connector and outputs on another so a through path measurement will require two connectors to be supported. To facilitate the testing of this type of system, on the rear of the eBIRST tool is an M-S port for connecting to another eBIRST tool in the Master-Slave (M-S) mode.

The rear of the tool also has three LEDs:

- M-S indication LED illuminates on the slave tool only in Master-Slave mode.
- Identification LED flashes when a command to identify is sent.
- Power LED indicates the presence of supply voltage (eBIRST power is provided by the USB port).

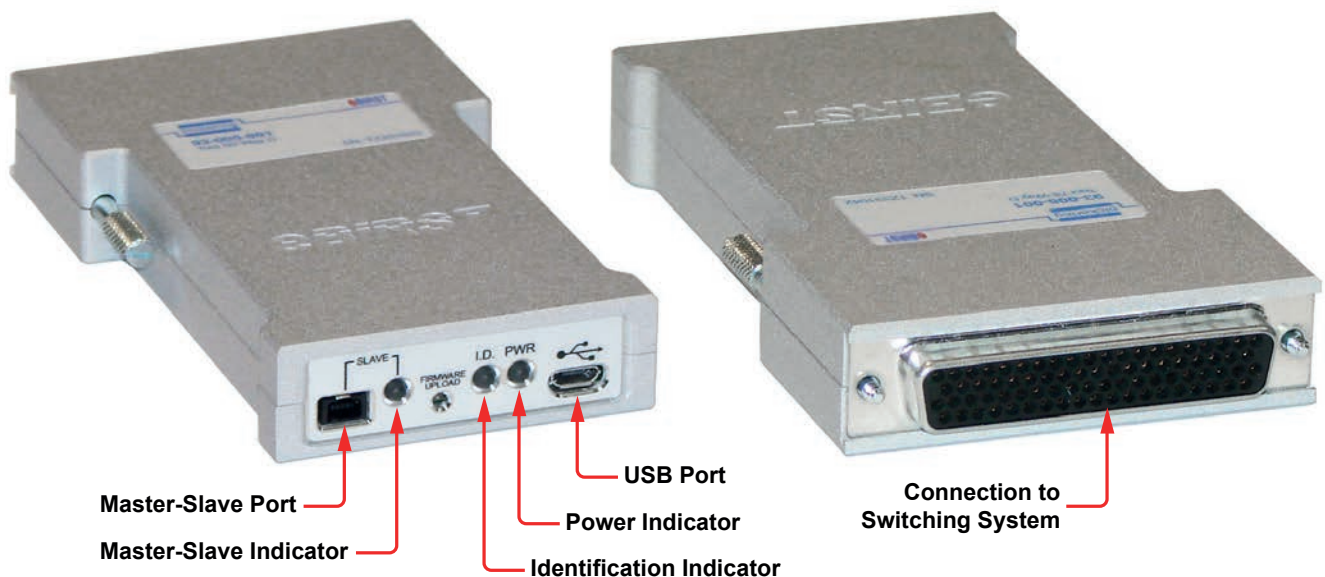


Figure 1.1 - Features of the 78-way D-type eBIRST Tool

USB Cable

A USB cable connects the control computer to the eBIRST tool. The cable is fitted with USB connector type A for the computer and a Micro-B for the eBIRST tool.



Figure 1.2 - USB Cable

eBIRST Adapters for other Connectors

For applications in testing switching systems with other connectors, such as the DIN 41612 160-way connector, adapters are available which convert from one of the three available eBIRST tools.



Figure 1.3 - Example Cable Based Adapter - 200-way LFH to 96-way SCSI connector



Figure 1.4 - Example PCB Based Adapter - 200-way LFH to 160-way DIN 41612 connector

eBIRST Adapter for RF Modules

For the testing of RF switching systems fitted with SMB connectors eBIRST adapters are available that serve as an interface between the eBIRST tool and the SMB coaxial connectors. Three versions are available:

- 50-Way D-type connector to 23 SMB connectors
- 78-Way D-type connector to 37 SMB connectors
- 200-Way LFH connector to 56 SMB connectors

The RF adapters are universal and can be used with any module fitted with a quantity of SMB connectors up to the maximum number for a particular adapter. During the set-up of the eBIRST application the connection details for the adapter can be presented (see the Tools Page section for details) to the user.



Figure 1.5 - 50-way D-type to 23xSMB Adapter

Master-Slave Cable

A Master-Slave cable is required for applications where two eBIRST tools are required to test a single switching system.

eBIRST Application Program

The eBIRST application program controls the testing of the switching system and creates a report describing the test results.

NOTE: Throughout this manual & the eBIRST application the PXI / PCI / LXI Device Under Test (DUT) may be referred to by various terms such as “instrument”, “switching system” and “DUT”, these terms are interchangeable.

Getting Started

Connect the eBIRST tool to the switching system either directly or through the cable/PCB/RF adapter. Ensure any screw locks are securely fastened from the eBIRST tool to any adapter or switching system to be tested.

Connect the eBIRST tool to the control computer via the USB cable. We do not recommend that connection is made via Pickering Interfaces 40-738 USB Hub due to the way the driver operates when opening and closing PXI interfaced modules. However users can connect the eBIRST tool to any conventional USB hub if the PC lacks enough direct USB connections.

The control computer must have the following features / abilities:

- Be able to control the switching system.
- Must be running a Windows operating system.
- Have a USB connection available to connect to the eBIRST tool. This can be a connection via a USB hub if the PC USB connections need expanding.

In the case of PXI systems, the controller can be remote from the chassis or embedded. For LXI systems the controller should be connected to the switching system by an Ethernet cable.

It is permissible to connect two eBIRST tools to different switch systems for concurrent testing.

If two tools are to be used in Master-Slave mode then they should be linked with an M-S cable.

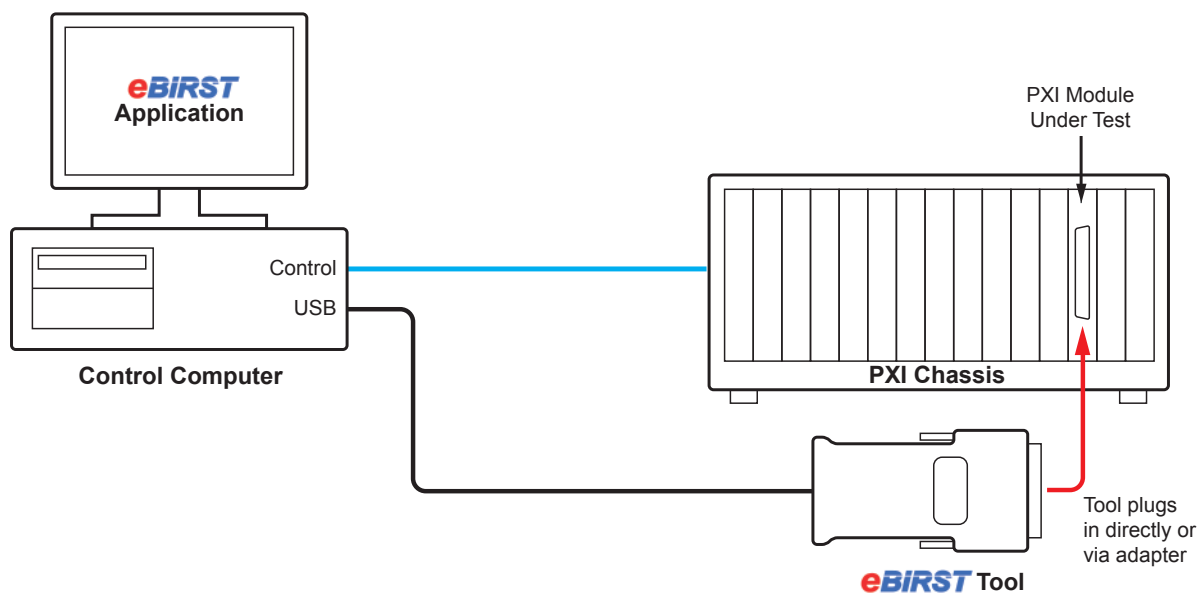


Figure 1.6 - Using the eBIRST System to test a module in a PXI chassis - eBIRST tool controlled directly from the test system's controller.

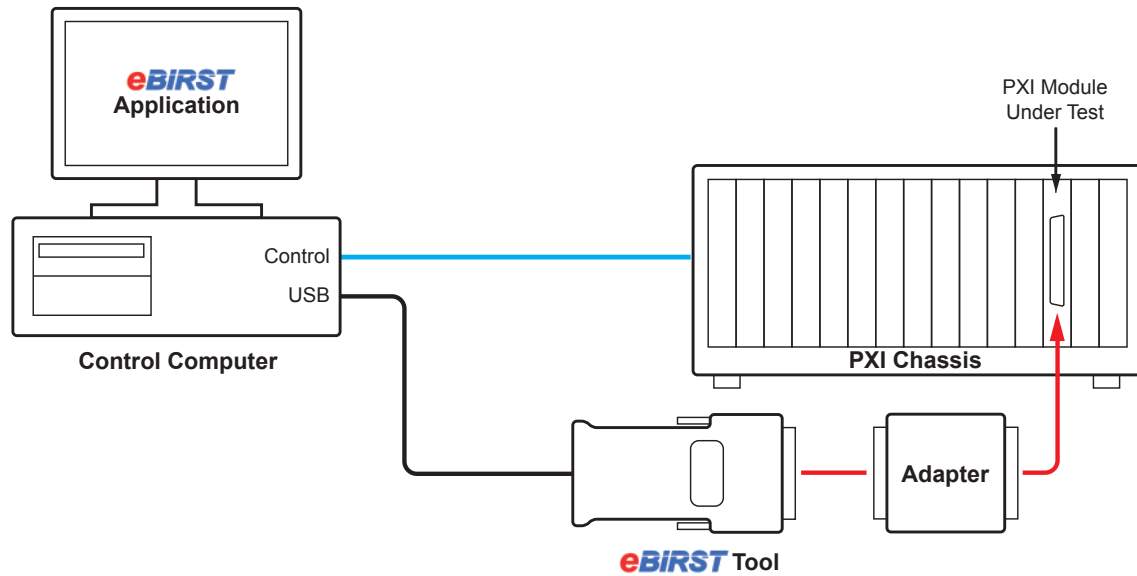


Figure 1.7 - Using the eBIRST System to test a module in a PXI chassis - using an adapter between the eBIRST tool and the switching system.

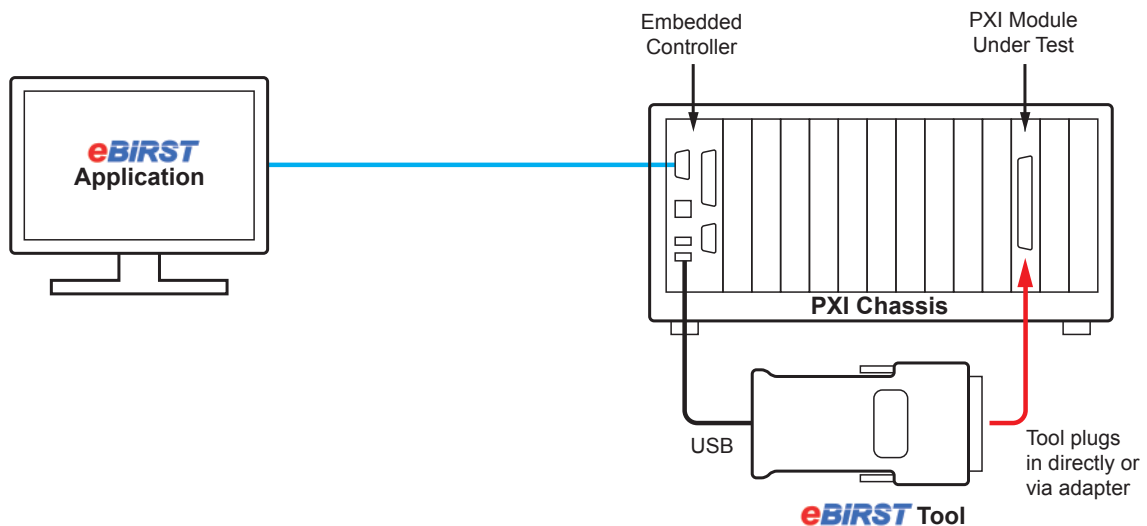


Figure 1.8 - Using the eBIRST System to test a module in a PXI chassis with an embedded controller - eBIRST tool controlled directly from the controller.

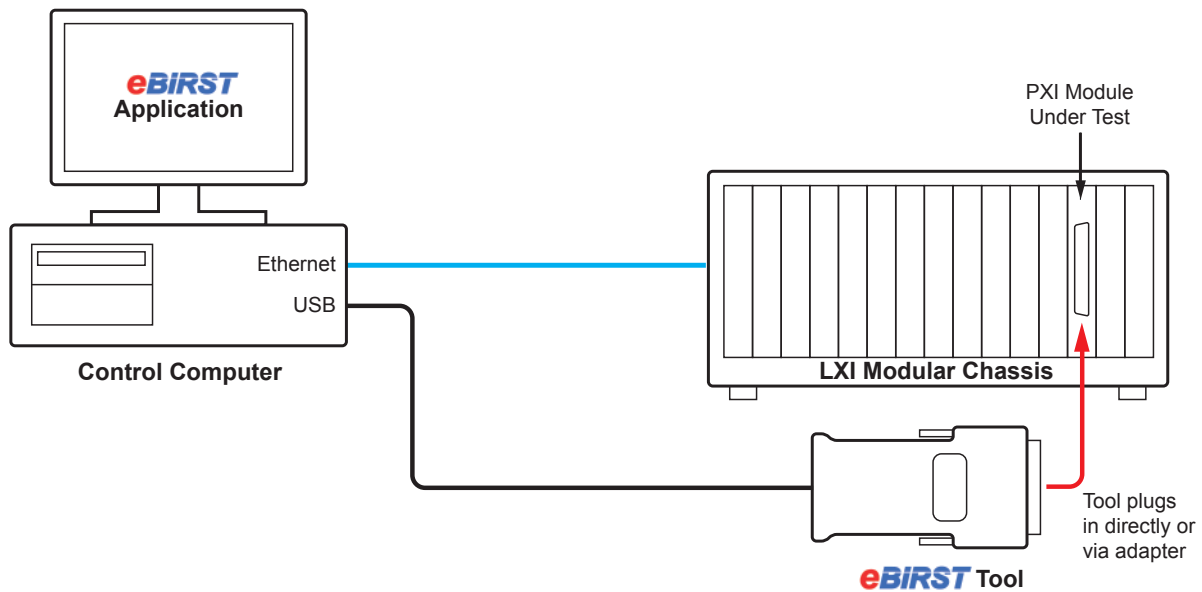


Figure 1.9 - Using the eBIRST System to test a module in an LXI modular chassis - eBIRST tool controlled directly from the test system's controller.

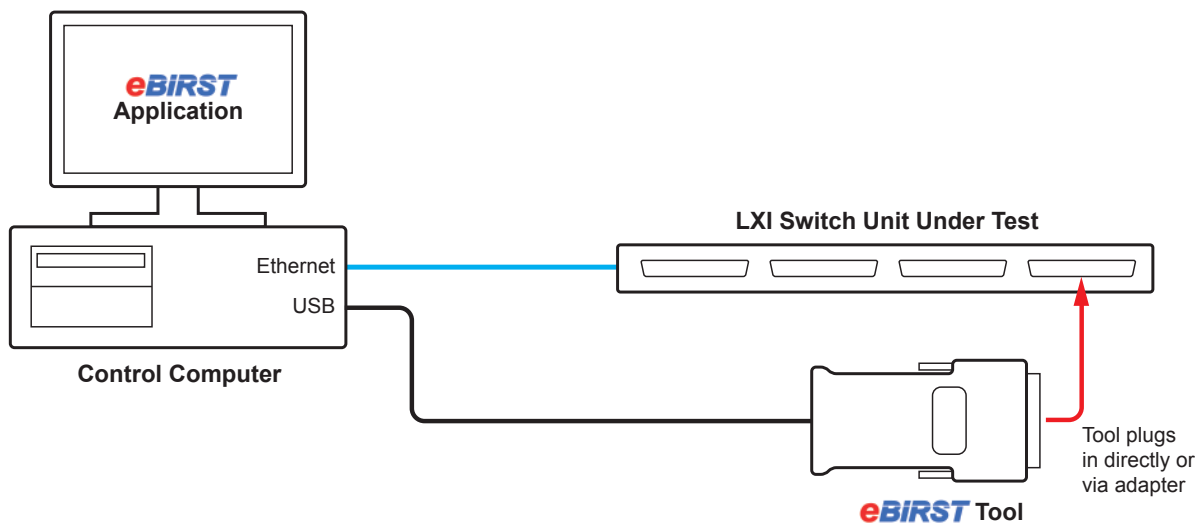


Figure 1.10 - Using the eBIRST System to test an LXI switch unit - eBIRST tool controlled directly from the test system's controller.

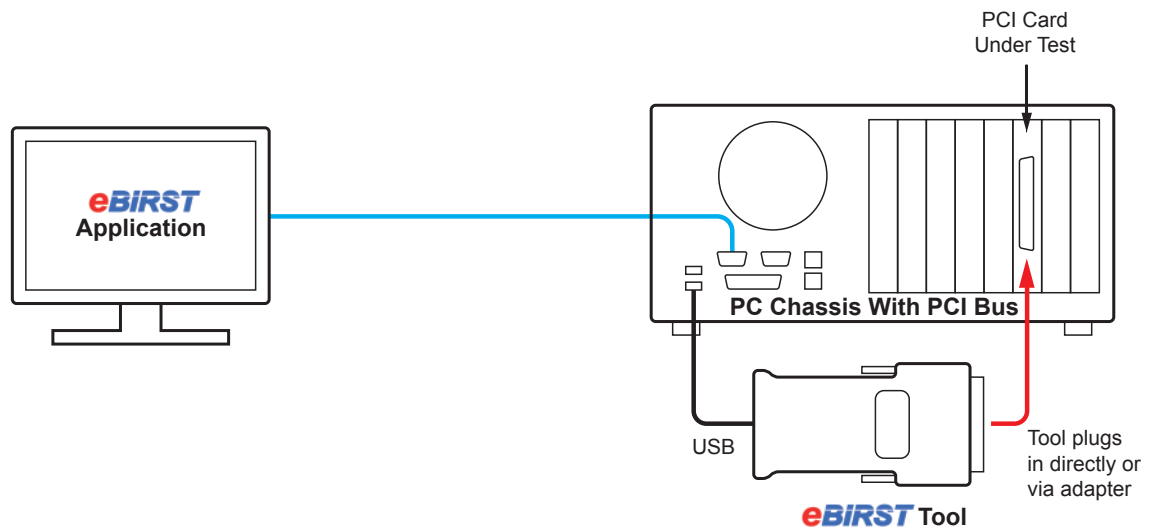


Figure 1.11 - Using the eBIRST System to test a card in a PCI chassis or an industrial PC - eBIRST tool controlled directly from the PC.

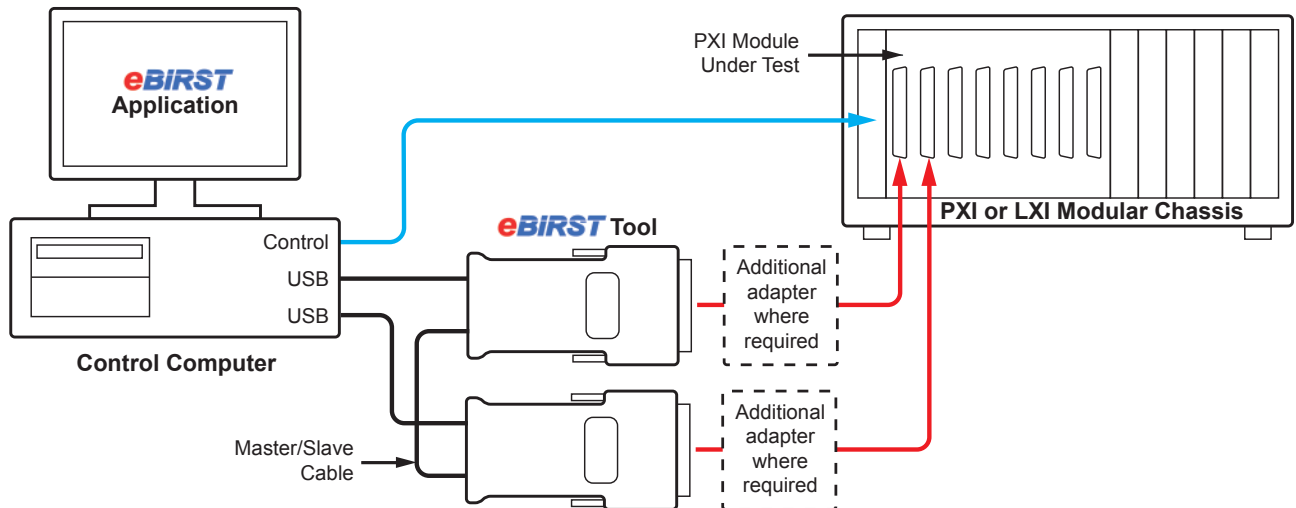


Figure 1.12 - Using two eBIRST Tools to test a module with two or more connectors in a PXI chassis or an LXI Modular Chassis - eBIRST tools in Master/Slave mode controlled directly from the test system's controller.

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SECTION 2 - eBIRST TOOL TECHNICAL SPECIFICATION

- Test Operation of Pickering Interfaces Switching Products
- Finds Faulty and Failing Relays
- Displays Position of Relays to be Replaced
- Simple USB Control From Any Windows® PC
- Uses USB Power, No External Power Source Required
- Simply Connect, Identify Test Target and Run the Software
- Test PXI, LXI or PCI Controlled Products
- Reduces Cost of Ownership and Switch System Down Time



eBIRST Test Tools

eBIRST is a range of USB controlled test tools capable of performing automated path resistance tests on Pickering Interfaces switching products. The tool simply interfaces with the product's user connector so a test can be run using the supplied Windows based software.

The tool is offered in a variety of versions for testing different switching products, each version is dedicated to one connector type and capable of testing any relay with a consistent path resistance at 30mA (any reed relay, solid state relay or typical EMR with 2A or less current rating). There are three core tools and a set of adapter interfaces to cover connectors used in our switching system range.

Benefits of eBIRST

The eBIRST range drives down the cost of ownership of switching systems:

- Easy local repair of switching systems
- Right first time repairs reduce the time and stress introduced by incorrect fault diagnosis
- Minimise system down time, eliminate the expense and time in returning damaged systems
- Reduces service cost
- Ease the time and cost of regular calibration intervals



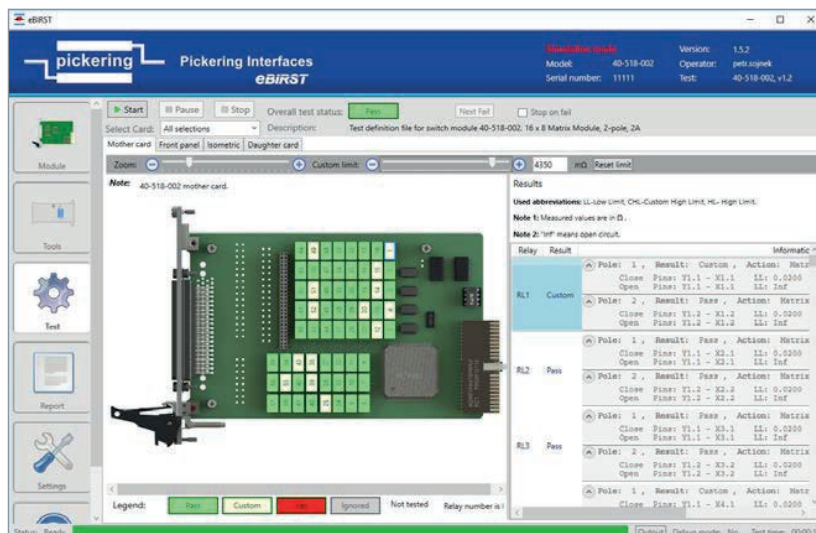
eBIRST Cable Adapter

Testing a Switching System

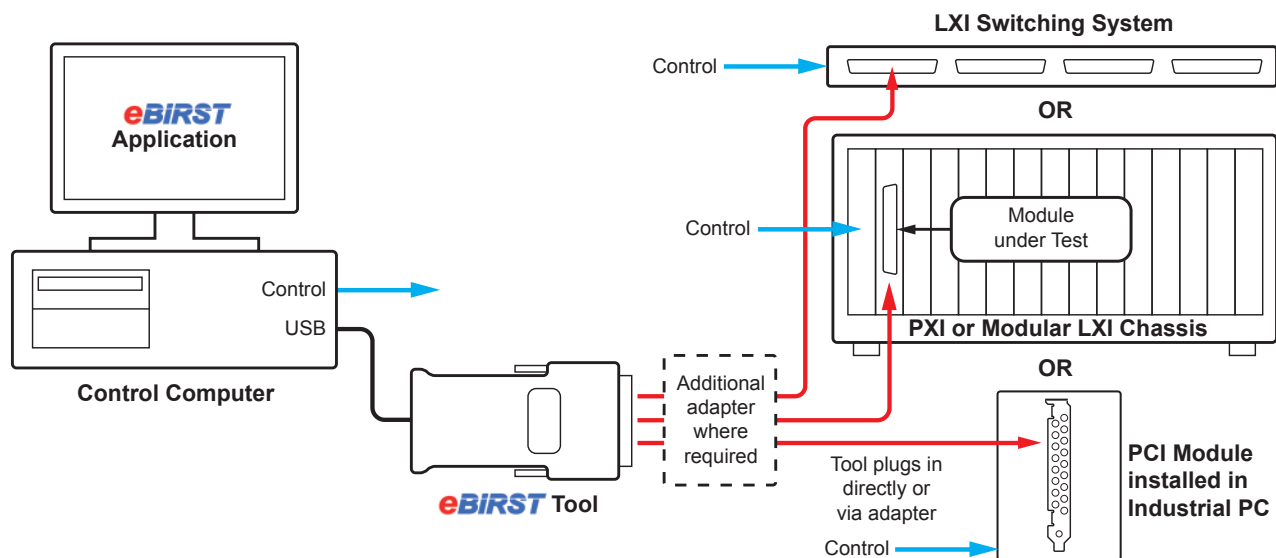
To test a switching system, most products require just a single test tool. Support for some connectors requires the use of a PCB based adapter or a cable adapter and a termination fixture. The supplied application program allows the tool to measure the switching system path resistance and identify relays which fail to open (are welded), fail to close or have high path resistance.

The eBIRST software will automatically choose the correct tool settings for measuring the path resistance to match the requirements of the relays in the switching system under test. Once a test is completed the application software highlights relay failures and issues, identifying the physical location of the defective relay on a graphical representation of the switch system layout. Once identified, the switching product can be repaired locally and the test re-run to ensure the corrective action has been successful.

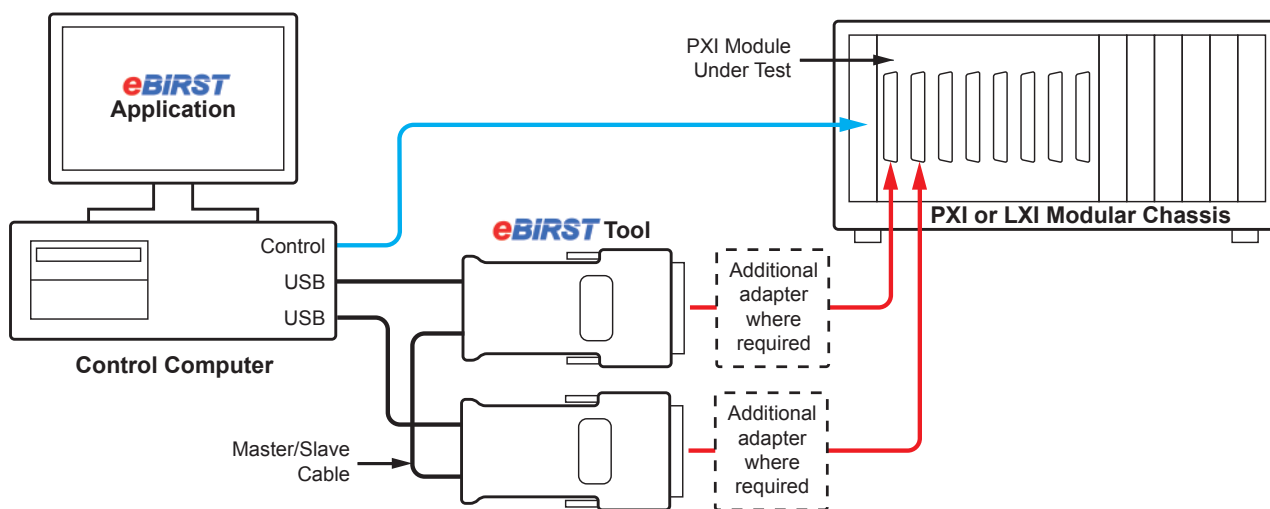
Typical graphical output from the eBIRST tool, failed relays are highlighted in red, their positions are mapped on to a representation of the switching system layout.



eBIRST Controlled Directly by a PC to Test LXI, PXI or PCI Switching Systems



Testing Switching Systems Requiring Two Tools in Master-Slave Configuration



Two Tool Master Slave Operation

Some products with multiple user connectors and a switched thru path may require the use of two tools in a master-slave arrangement to provide 100% test coverage, where this is the case users should purchase two tools to match their connectors and the eBIRST slave mode connection cable accessory.

Testing RF Modules

The DC testing of RF coaxial products fitted with SMB connectors can be supported by ordering an interface adapter that converts the eBIRST interface to a coaxial interface.

Mechanical Compatibility

Tool dimensions are compatible with use in PXI, LXI and PCI products without having to remove connectors from adjacent user connections or modules.

USB Control

The eBIRST tools are simply controlled by attaching them to the USB ports of a PC or a USB hub. The USB2 connection provides all the power the eBIRST tool requires.

Tool Verification

eBIRST tools can be verified by the use of an optional verification fixture. When used with a single tool, the fixtures check that the eBIRST tool is performing to acceptable accuracy, when two tools are available of the same type the fixture can be used to perform a full functional test of its accuracy and the functionality of the in built multiplexer used to access the switching system connector pins.

Specification

eBIRST Test Tools

Functionality:	Measures path resistance of switching systems to identify faulty relays.
Control:	USB2 interface from a PC running Windows. Input connection USB Micro-B type connector.

Measurement Ranges:	
Test Currents:	0.1mA, 1mA, 10mA, 30mA
Open Circuit Test Voltage:	5V
Resistance Measurement Ranges:	Full scale ranges from 1.83Ω to 740Ω depending on tool setting.

Power Supply:	Operates from USB power with less than 0.5A current draw, recommend using a lead up to 2m. Power supply internally regulates to ensure USB voltage independency.
Software:	Supplied with executable only software. Support is provided only for Pickering Interfaces switching products. Requires a PC running a Windows operating system.
Software Upgrades:	Application program updates available from Pickering Interfaces web site free of charge. Application program updates add new Test Definition Files as they become available. eBIRST tool firmware updates not routinely required.



eBIRST Tool Rear Panel



eBIRST Termination Fixture

Supported Products:

Switching systems using relays with consistent contact resistance at 30mA or less (all reed relays, solid state and typically EMR based designs with 2A or less current rating) based on three eBIRST tools and a variety of cable/PCB adapters which interface to all Pickering Interfaces switching system connectors in the PXI, PCI and LXI control platform. The supported products are indicated on switching system data sheets and their web site landing pages. The range of switching systems supported is being constantly expanded and eBIRST users can request the creation of additional Test Definition Files to support their Pickering Interfaces switching systems.

Mechanical Information:

Size varies by tool part number. All tools fully protected by metal enclosure and can be connected to PXI, LXI or PCI switching products without removal of connectors to adjacent products or connectors.

eBIRST Cable & PCB Adapters

Functionality:	Converts eBIRST test tool to alternative connectors.
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eBIRST Verification Fixture

Functionality:	Allows eBIRST tools to be connected together to do a functional check. Provides precision resistors which can be measured by the eBIRST tool and by an external DMM for eBIRST functionality verification.
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Reference Resistor Accuracy:	0.1%
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eBIRST SMB Co-axial Adapter



eBIRST Verification Fixture

This page provides information on what to order for different types of switching product by the connector used. For each connector two options are listed, the first lists the parts which are essential and the second indicates the optional parts required if the user wishes to independently verify the tools. Verification fixtures are entirely optional but are shown for convenience. The second table indicates the parts required if the switching system requires the use of two tools, which makes it essential the user has a Slave Mode Connection Cable.

200-Pin Male LFH Test Tool

78-Pin Female D-type Test Tool

50-Pin Female D-type Test Tool

Connector Type on Module Under Test	Single Tool Parts Required	Optional Parts
200-pin Female LFH	1 off 200-pin Male LFH Test Tool: 93-002-001	1 off Verification Fixture 200-pin LFH: 93-002-101
160-pin Male DIN41612	1 off 200-pin Male LFH Test Tool: 93-002-001 1 off 160-pin Female DIN41612 Adapter PCB: 93-002-410	1 off Verification Fixture 200-pin LFH: 93-002-101
96-pin Male SCSI style	1 off 200-pin Male LFH Test Tool: 93-002-001 1 off 96-pin Female SCSI Style Adapter Cable: 93-002-226 1 off 96-pin SCSI Style Termination Fixture: 93-016-103	1 off Verification Fixture 200-pin LFH: 93-002-101
SMB co-axial (up to 56 connectors)	1 off 200-pin Male LFH Test Tool: 93-002-001 1 off 56xSMB Co-axial Cable Adapter: 93-002-202	1 off Verification Fixture 200-pin LFH: 93-002-101
78-pin Male D-type	1 off 78-pin Female D-type Test Tool: 93-006-001	1 off Verification Fixture 78-pin D-type: 93-006-101
68-pin Female SCSI style	1 off 78-pin Female D-type Test Tool: 93-006-001 1 off 68-pin Male SCSI Style Adapter PCB: 93-006-401	1 off Verification Fixture 78-pin D-type: 93-006-101
SMB co-axial (up to 37 connectors)	1 off 78-pin Female D-type Test Tool: 93-006-001 1 off 37xSMB Co-axial Cable Adapter: 93-006-202	1 off Verification Fixture 78-pin D-type: 93-006-101
50-pin Male D-type	1 off 50-pin Female D-type Test Tool: 93-005-001	1 off Verification Fixture 50-pin D-type: 93-005-101
37-pin Male D-type	1 off 50-pin Female D-type Test Tool: 93-005-001 1 off 37-pin Female D-type Adapter PCB: 93-005-418	1 off Verification Fixture 50-pin D-type: 93-005-101
25-pin Male D-type	1 off 50-pin Female D-type Test Tool: 93-005-001 1 off 25-pin Female D-type Adapter PCB: 93-005-414	1 off Verification Fixture 50-pin D-type: 93-005-101
9-pin Male D-type	1 off 50-pin Female D-type Test Tool: 93-005-001 1 off 9-pin Female D-type Adapter Cable: 93-005-238 1 off 9-pin D-type Termination Fixture: 93-003-103	1 off Verification Fixture 50-pin D-type: 93-005-101
8-pin Male Power D-type	1 off 50-pin Female D-type Test Tool: 93-005-001 1 off 2x8-pin Female Power D-type Adapter Cable: 93-005-236 1 off 8-pin Power D-type Termination Fixture: 93-012-103	1 off Verification Fixture 50-pin D-type: 93-005-101
SMB co-axial (up to 23 connectors)	1 off 50-pin D-type Test Tool: 93-005-001 1 off 23xSMB Co-axial Cable Adapter: 93-005-202	1 off Verification Fixture 50-pin D-type: 93-005-101

Master/Slave Tools

Where two tools are required, use the following guide.

Connector Type on Module Under Test	Tool Parts Required	Optional Parts
68-pin Male SCSI style (used on BRIC Modules)	2 off 78-pin Female D-type Test Tool: 93-006-001 2 off 68-pin Female SCSI Style Adapter Cable: 93-006-222 1 off 68-pin Male SCSI Style Termination Fixture: 93-015-103 Slave Mode Connection Cable: 93-970-301	1 off Verification Fixture 78-pin D-type: 93-006-101
All Other Connectors	Tool for each connector as in table above Slave Mode Connection Cable: 93-970-301	Verification Fixture as in table above

Module Support

The eBIRST tool is being continuously expanded to cover the majority of Pickering Interfaces switching systems in PXI, LXI and PCI form factors that use the connector interfaces listed. To check if your switching systems are supported contact your local sales office.

SECTION 3 - SOFTWARE INSTALLATION

The eBIRST tool software installs in two steps:

The USB driver for the eBIRST Tool.

The application program.

USB Driver Installation

- 1 Plug the eBIRST tool into the USB socket. Part of the eBIRST tool is a flash disc that contains the eBIRST driver.
- 2 Go to **Device Manager**. An image similar to the following should be displayed:

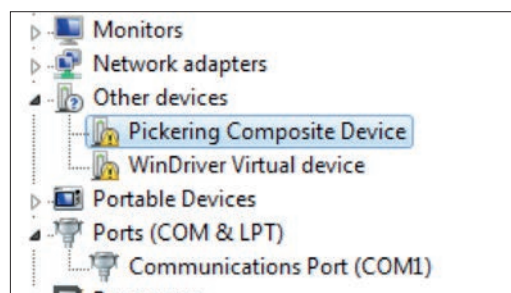


Figure 3.1 - Pickering Composite Device denotes eBIRST tool

- 3 Right click on **Pickering Composite Device** and select **Update Driver Software**.
- 4 On the next screen select **Browse my computer for driver software**:

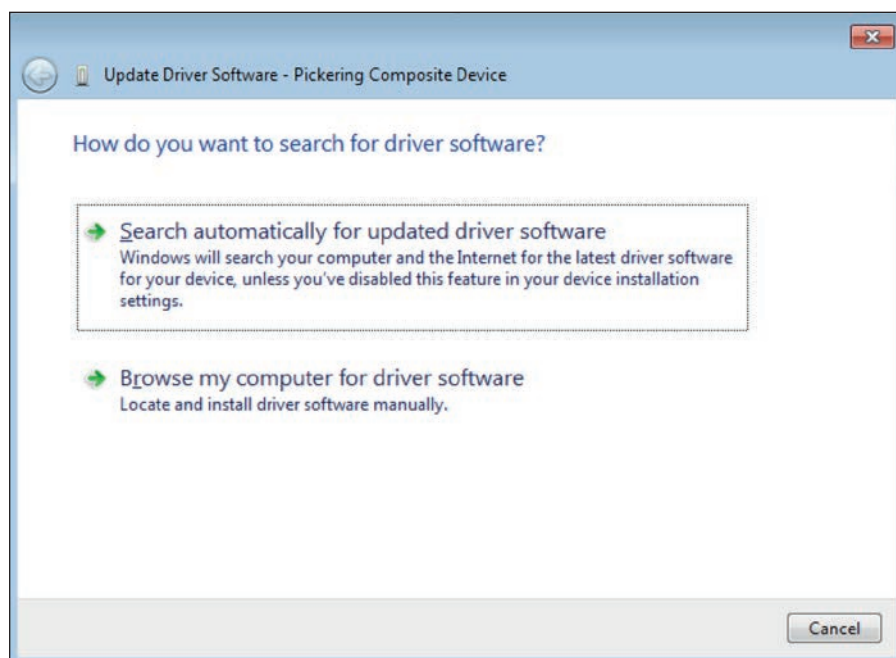


Figure 3.2 - Update Driver Software popup window

- 5 On the next screen select **Removable Disk** (denotes plugged in eBIRST tool):

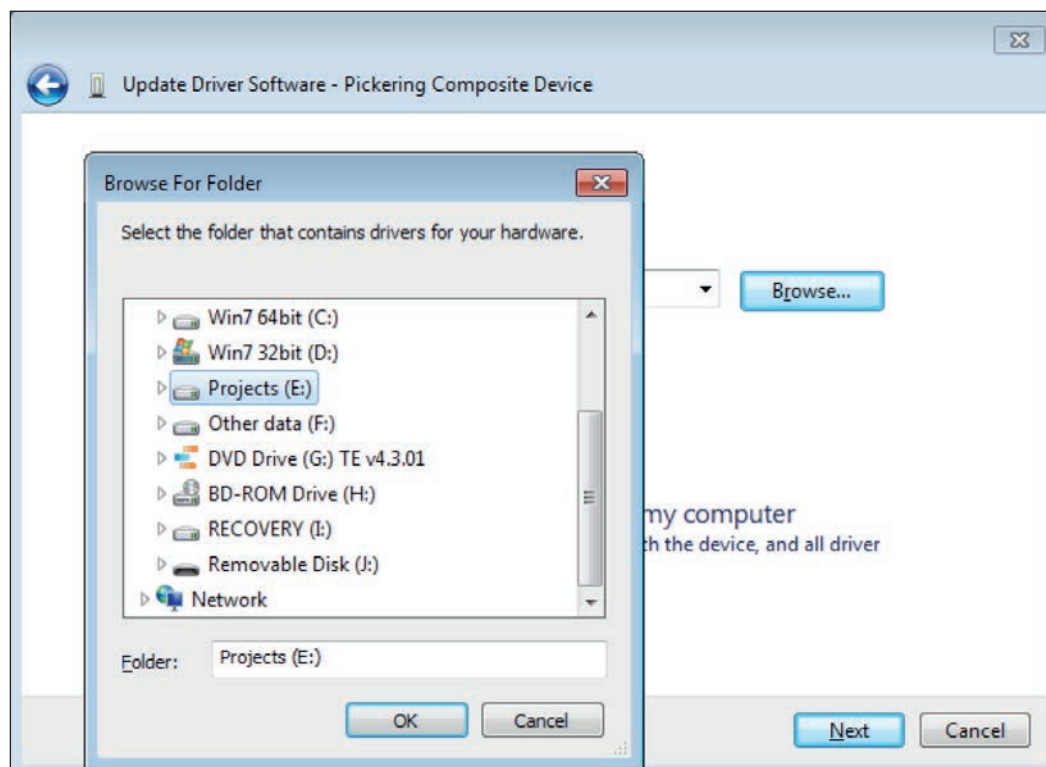


Figure 3.3 - Browse for folder popup window

- 6 Press **Next** to install eBIRST driver.

7 Now the device should be installed successfully. You should see the following:

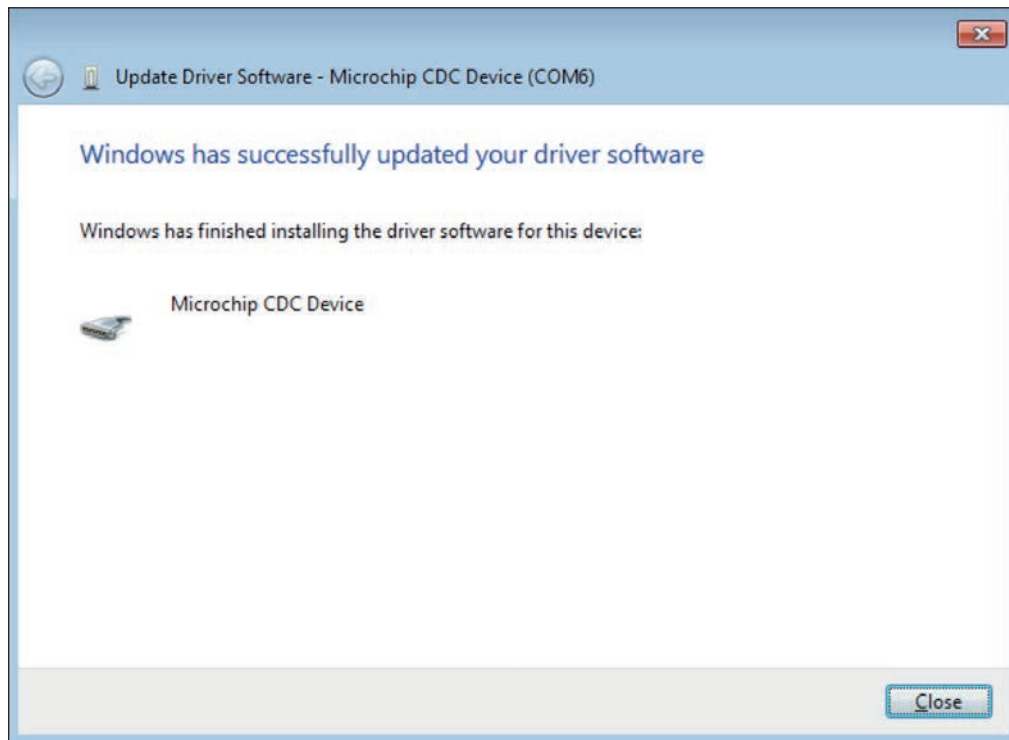


Figure 3.4 - Update Driver Software success popup window

Application Program Installation

Run the installation package from the supplied DVD and follow the instructions. The application program will automatically install dependencies such as .NET RTE. In case the Pickering PXI driver is not installed a warning window will appear notifying that without the driver it will not be possible to use the eBIRST tool with PXI cards.

The installation creates a folder in the Start menu as well as a desktop icon.

Updating the Application Program

The eBIRST Application Program can be updated using update packages created by Pickering Interfaces. You may need to update either because a new switching system has been encountered that your present version does not support or to fix known issues with the application program.

- 1 Go to **Settings** page and press **Update**.
- 2 Select **Update Package** and the update will be automatically executed. You can also enter an MD5 checksum to make sure update package is not corrupted.

SECTION 4 - SOFTWARE DESCRIPTION

The eBIRST application consists of a single “page” (see Figure 4.1) from which subsequent pages / windows are selectable. This section will explain the purpose and options for the various pages.

At initial startup the pages will display default information. In addition to the function specific pages such as “tools”, “test” etc, there is a settings page that is used to configure the application for use.

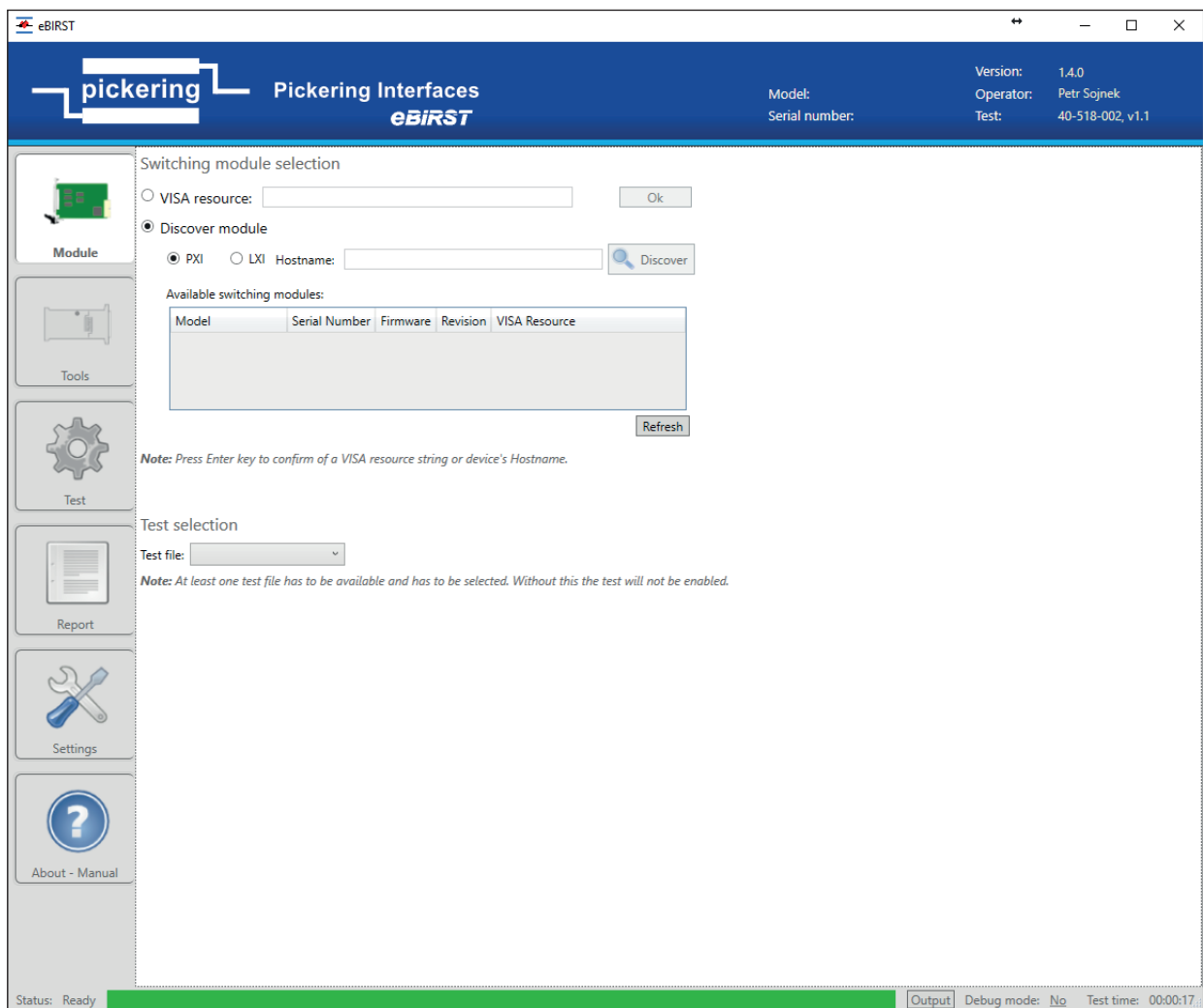


Figure 4.1 - eBIRST software application page

Application Header



Figure 4.2 - eBIRST Application Page Header

The banner at the top of the application page contains information that is available all the time in all application views.

Simulation mode

This sign shows that the application is currently in simulation mode and no hardware is used.

Model

The model number of presently selected switching module.

Serial number

The serial number of presently selected switching module.

Version

The version of eBirst application

Operator

The name of operator using application (this is windows account name)

Test

The test definition file loaded for presently selected switching module.

Tools Page

The tools page contains information about connected tools as well as their assignments for tests.

Tool selection

Available Tools:

Name	Type code	Serial number	Firmware	Port
SIMULATED eBIRST TOOL	EBIRST	TZ172723	1.0.10.20	SIM1

Tool 1

SIMULATED eBIRST TOOL

Identify

Connector:

DSUB

Adapter:

Not required.

Check

Compensate

☐ Use previous

[Adapter connection scheme](#)

Tool 2

Identify

Connector:

Adapter:

Not required.

Check

Compensate

☐ Use previous

[Adapter connection scheme](#)

Figure 4.4 - eBIRST Software Tools Page Window

Tool selection

Available tools

The table contains all available eBIRST tools connected to the control PC. Select the tool you want to work with. By right clicking you can rename the selected eBIRST tool.

Tool 1 & Tool 2

Tool1 and Tool2 sections let you assign the eBIRST tool to a particular test. Most tests require only one tool to be assigned, but some may require two for Master Slave measurements. If only one tool is required, the **Tool2** section will be grayed out.

- Assign a tool to test by choosing it from the combo box. Note that the combo box will only contain tools that are usable for the test.
- **Identify**: The identify button next to the textbox allows physical recognition of the eBIRST tool. The red LED will blink on the tool for a short time after activation.
- **Connector**: The connector combo box contains all available connectors of the switching system. The selected connector provides information where the eBIRST tool is connected.
- **Adapter**: An adapter is required for some switching systems (notably those using RF connectors) to convert connector types. The left field indicates the adapter state, the right field can be clicked to refresh the adapter state. If the correct adapter is being used for the switching system under test the left box will indicate “OK” or “Not Required”, if an incorrect adapter is fitted the left field will show “Incorrect Adapter”.
- **Check**: This button identifies and verifies that the adapter is connected.
- **Compensate**: For cable based adapters (such as 200 pin to 96 pin adapter), the cable’s resistance needs to be compensated for by pressing this button. You will be asked to connect a shorting fixture on the card connection side of the adapter. After the cable has been compensated the fixture can be removed.

- **Use Previous:** The compensation needs to be re-adjusted every time a new module is selected. If the same cable is used and re-compensation is not necessary, click this check box to use the previous measurements. Note that the compensation measurements are maintained during an application restart, it is left to the customers discretion if previous compensation values are to be used or the cable adapter needs re-compensation.
- **Connection schema:** In the case where an adapter is required, this brings up a window (See Figure 4.4) with information about how the adapter should be connected to the front panel of the module. The connection schema window presents the user with a list of “labels” that relate to the DUT front panel connector identifiers (“pin name” column) cross-referenced to the cable numbers of the RF adapter (“pin of adapter” column). This information is to be used to connect the RF adapter to the DUT.

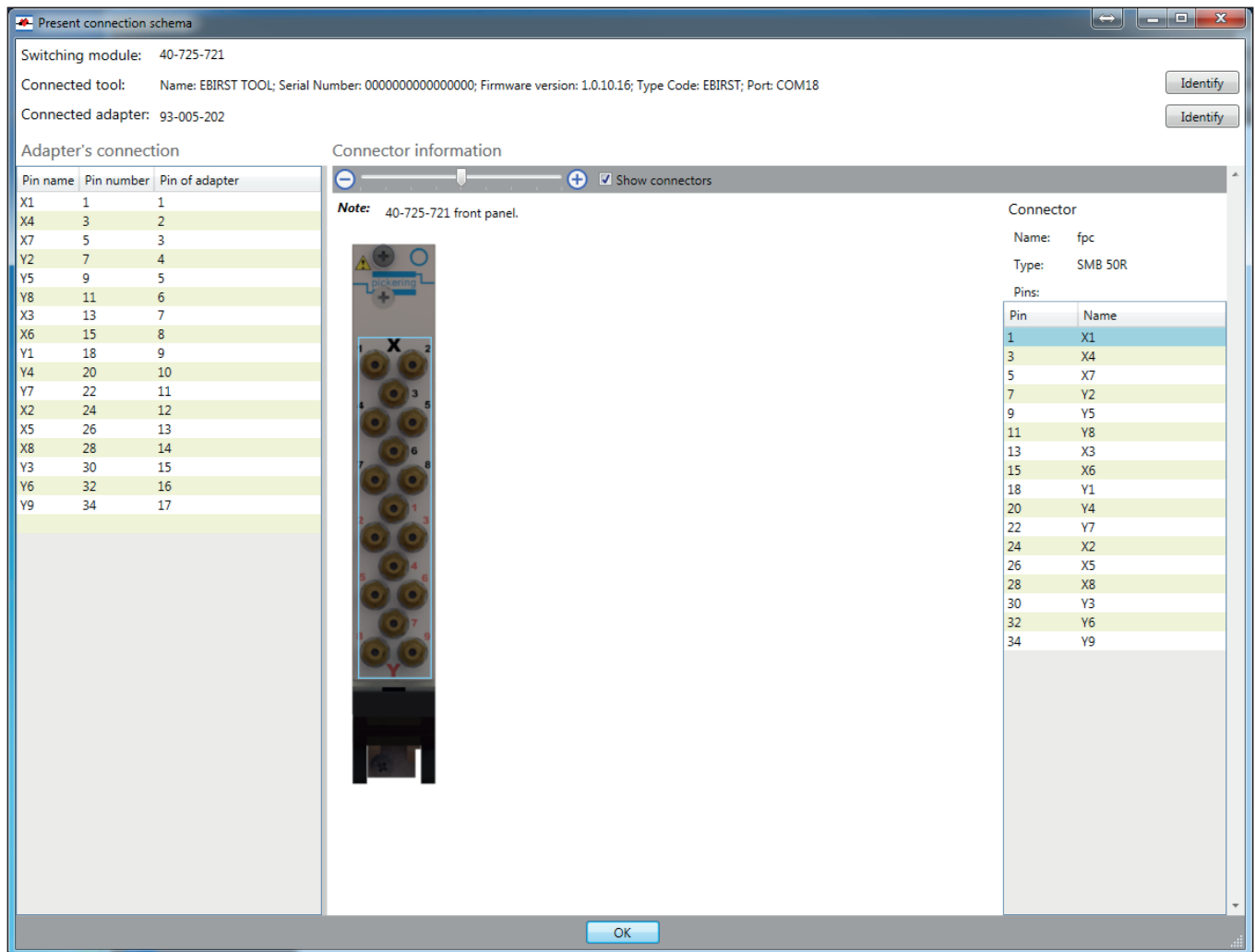


Figure 4.5 - eBIRST software connector connection schema window

Test Page

The Test page is the core of the eBIRST software. This page runs the tests on the module, analyzes results of these tests and displays them to the user.

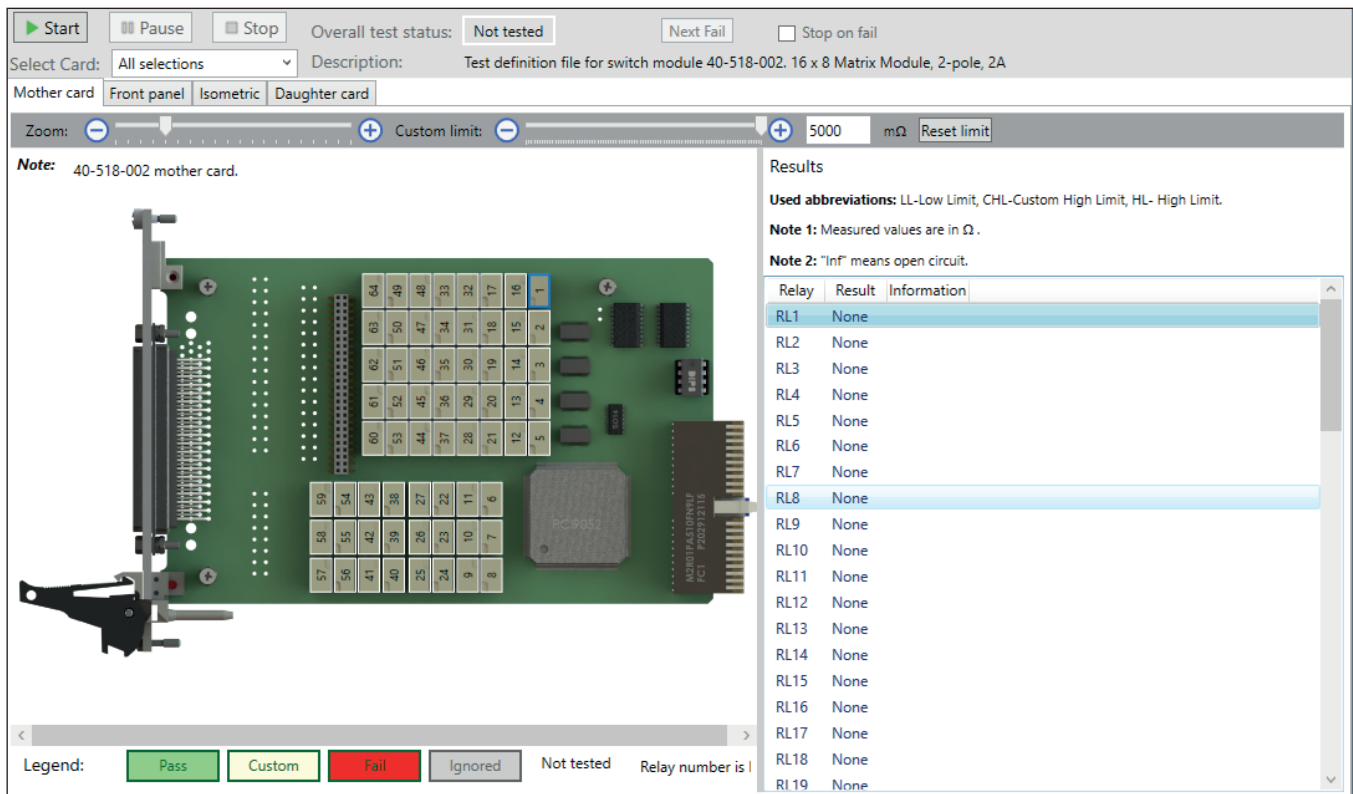


Figure 4.6 - eBIRST software Test Page screenshot

The top of the page provides the following buttons:

- **Start:** start the configured test.
- **Pause:** pause running test. A paused test can be resumed.
- **Stop:** stop running test. A stopped test can't be resumed and must be re-run from the beginning.

The middle of the page shows different views of the module.

- Main view is a side view which contains all the relays. It also shows test results of these relays.
- A second view shows the front panel. This lets you to see the module's connectors and their description.
- The last view is an isometric view which displays the module as 3D model.

The right side of the page shows the results from the measurements. It contains the tested component name (e.g. R27 – relay number 27) and the associated tests with results.

Relay selection: The relay highlighted with a blue border in the main view is currently selected in report list.


Custom limit slider: The Custom limit provides the user an opportunity to identify switch path resistances which breach a different limit to that defined in the Test Definition File. Users can use this slider to adjust the limit. This can be useful where users are using the switching system in applications which are more (or less) sensitive to path resistance than the limit in the Test Definition File. As the Custom slider is changed all paths that breach the limit are marked.

Select Card

More complicated modules that consist of many daughterboards (mostly BRIC and LXI) have the possibility to test each daughterboard individually. In this combobox, you can select which daughterboards you want to test. The default is all selections, which means test the whole module.

Report Page

This page is activated after the test has been run and lets you save the test result in a specific format.



Report builder

Report parameters

Report type:

Content options: ☒ Include Pass ☒ Include Warnings ☒ Include Errors ☒ Include Ignored ☒ Include Images

Report actions

[View](#) [Save](#) [Print](#)

Figure 4.7 - eBIRST software Report Page screenshot

The test report can be stored in these different formats:

- **Detailed Html:** produces an html page with all results and can also contain a picture of the side view, the same as seen on the Test page.
- **Straight Html:** produces a detailed html page with results presented in a table.
- **Detailed Xml:** produces an xml file with results stored in an xml structure that can be used for processing later.
- **Detailed Text:** produces a plain text file that can be viewed using any text editor.
- **Straight Text:** detailed text format with results presented in a table.
- **CSV:** Comma Separated Values file suitable for viewing as a spreadsheet or importing into a database.

Information stored in files can be filtered using various options. The html type is the only format that can also contain the card picture.

The test report can be viewed, saved or printed. The **View** link will open the file with the application assigned to the particular file extension by the system.

Settings Page

The Settings page contains various default options that should be set prior to performing a test. The usage examples section of this manual provides details of various test setups that can be produced with the eBIRST application.

Tool

Communication Timeout [ms]:

5000

Infinity

☐ Ask for tool change at the start of test

Switching module

Switching module driver:

Name	Version	ID	Description
PiCBControlAddIn	1.0.3.0	8472fb0d-611d-4736-88f4-6a4cbeb33a8a	Pickering Client Bridge
SimulationAddIn	1.0.0.0	eee121b5-75e9-4628-bece-e49d898c149f	Pickering Simulation

Simulated hardware

Only for LXI

Echo port:

9999

RPC port:

1024

Communication Timeout [ms]:

10000

Infinity

Board:

☒ Exclusive access of switching module

Report

Report type:

DetailedHtml

Content options:

☒ Include Pass

☒ Include Custom

☒ Include Errors

☒ Include Ignored

☒ Include Images

Application

Update

MD5 check sum:

Update application

Save settings

Figure 4.8 - eBIRST software Settings page window

Tool section

This section contains optional settings of the eBIRST tool.

Communication Timeout

The Communication Timeout option denotes the maximum amount of time in milliseconds that a single operation may take. If a timeout is not required, press the *infinity* button next to the input field.

Ask for tool change at the start of test

When this option is checked, the application will prompt the operator to connect the tool to the switching module every time new test is run. For single connector modules this may not be required.

Module section

This section describes the default setting for the module page of the tool.

Switching module driver

This section lists and selects the default module driver that will be used to communicate with the system.

Simulated hardware

Click this button to turn simulation mode of the application on. This can also be done by selecting **SimulationAddin** in the Switching module driver table. See more in section about simulation.

Only For LXI

LXI properties are used when discovering and communicating with LXI devices:

- **Echo Port:** Communication port used for broadcasting LXI.
- **RPC Port:** Communication port used for connecting to LXI.
Note: these settings will typically not require adjustment as they match the settings of the LXI DUT. In a situation where the LXI DUT has these values altered it will also be necessary to apply the revised values to the eBIRST application.
- **Communication Timeout (ms):** Maximum time an LXI operation can take.
- **Board:** Network interface card (NIC) used for broadcasting.
- **Exclusive access of switching module:** This option allows the operator to run the switching module in non-exclusive mode. In this mode other applications may access card. For example, the module's soft front panel can be used as a monitor.

Report Section

This section sets the default settings for the report page of the tool.

Report type

Sets the default report format on the report page.

Content options

Sets the default report options on the report page.

Application Section

The Application section is used for applying update packages supplied by Pickering Interfaces Ltd.

Update

Confirmation of proper update package selected. This starts the update process.

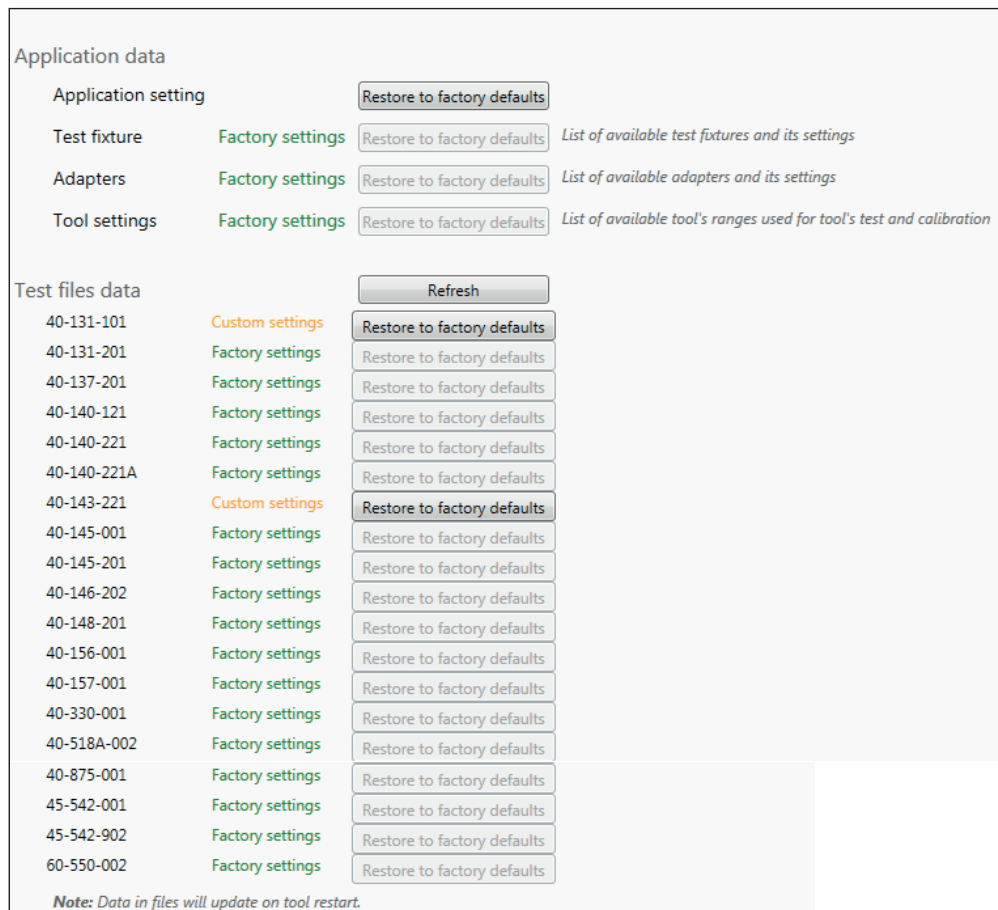
MD5 checksum

MD5 checksum of the package, to make sure package is not corrupted.

Save settings

The **Save settings** button stores any changed settings.

Note: some settings will require an application restart to become effective.



Application data

Application setting		Restore to factory defaults	
Test fixture	Factory settings	Restore to factory defaults	List of available test fixtures and its settings
Adapters	Factory settings	Restore to factory defaults	List of available adapters and its settings
Tool settings	Factory settings	Restore to factory defaults	List of available tool's ranges used for tool's test and calibration

Test files data

		Refresh
40-131-101	Custom settings	Restore to factory defaults
40-131-201	Factory settings	Restore to factory defaults
40-137-201	Factory settings	Restore to factory defaults
40-140-121	Factory settings	Restore to factory defaults
40-140-221	Factory settings	Restore to factory defaults
40-140-221A	Factory settings	Restore to factory defaults
40-143-221	Custom settings	Restore to factory defaults
40-145-001	Factory settings	Restore to factory defaults
40-145-201	Factory settings	Restore to factory defaults
40-146-202	Factory settings	Restore to factory defaults
40-148-201	Factory settings	Restore to factory defaults
40-156-001	Factory settings	Restore to factory defaults
40-157-001	Factory settings	Restore to factory defaults
40-330-001	Factory settings	Restore to factory defaults
40-518A-002	Factory settings	Restore to factory defaults
40-875-001	Factory settings	Restore to factory defaults
45-542-001	Factory settings	Restore to factory defaults
45-542-902	Factory settings	Restore to factory defaults
60-550-002	Factory settings	Restore to factory defaults

Note: Data in files will update on tool restart.

Figure 4.9 - eBIRST software Settings page window – Application data section

Application data

This section contains the state information of various setting and definition files. The file state can be one of the following three:

- **Factory settings:** settings are the same as when application was installed/updated.
- **Custom settings:** settings are not the recommended values but are valid and loaded into the application. Custom settings should only be used under the direction of Pickering Interfaces.
- **Invalid:** setting file has an error and cannot be loaded.

The **Restore to factory defaults** button replaces the settings with the factory defaults stored in cache. This option should be used if a test file has an error as indicated by the “invalid” status.

Test files data

First press the **Refresh** button. This will show a list of all available test files and their status. The test files data section serves two purposes:

- Displays status of all definition files used for testing.
- Displays all supported models.

Note: Default settings will be in effect after a re-start of the application.

SECTION 5 - USAGE EXAMPLES

INTRODUCTION

In this section some examples of how to use eBIRST in different circumstances are provided.

To use eBIRST you should have installed the application software. You may wish to download the most recent version of the application program to ensure you have the files required for the Pickering Interfaces switching system to be tested.

You will need the eBIRST tools required to support your switching system:

- The USB controlled eBIRST tool required to support the switching system. This will typically be indicated on the switching system data sheet, if not you can use the eBIRST data sheet to identify the tool required based on the connector(s) it uses.
- You MAY need an adapter to convert from the eBIRST tool connector to the switching system connector.
- If the adapter is a cable based design you will require a Termination Fixture, again identified on the switching system data sheet or the eBIRST data sheet, which provides a shorting function that allows the eBIRST tool to check the cable and to remove the residual resistance of the cable interface.

When testing a switching system through an adapter ensure that the screw locks for the adapter are secured, on the 200-way LFH tool this will require the use of a screwdriver. Failure to secure the adapter to the tool may result in the adapter not being recognised and the test not being run.

Testing a PXI Module with the eBIRST Tool

Before starting, prepare the hardware for measurement. The PXI module must be in a powered chassis and recognized by the controller.

- 1 Connect the eBIRST tool as defined in the Getting Started section of this document.
- 2 Run the eBIRST Application program.
- 3 Navigate to the **Settings** page.
 - a Select **PiCBControlAddin** driver.
- 4 Navigate to the **Module** page.
 - a Set **Discover module** and **PXI**.
 - b Wait until module list refreshes.
 - c If the module list is not populated, make sure the instrument is properly connected and double check the driver selection on the **Settings** page.
 - d Select the module you want to test.
 - e Select appropriate test definition file under **Test file**.
 - f If there is no test file displayed, the test definition file is missing. This can occur if the module is either not supported or the test file is broken. Go to the **Settings** page and attempt to restore the test file to factory settings. If the test file is still not displayed please contact Pickering Customer Support.
- 5 Navigate to the **Tool** page.
 - a Select the appropriate tool in the **Available tools** table and assign it to the connector.
 - b If there is no tool available in the table, disconnect & reconnect the eBIRST tool from the USB connector. The tool should appear, if it does not, please contact Pickering Customer Support.
- 6 Navigate to the **Test** page.
 - a Press **Run** at the top of the screen to run the test.
 - b The **Run** button will be grayed out. **Pause** and **Stop** buttons will be highlighted and available for use. Whilst the test is running the top grey bar turns green.
 - c As the test is running, for some modules you can hear “clicking” as the relays are being switched.
 - d Wait for the testing process to finish.
 - e When the process finishes, the side view of the module's PCB is displayed, populated with relay states and a table on the right is filled with detailed test data.
 - f Click the relays in the view to navigate to the relevant table entry.

How to Test a Pickering PXI RF Module in an LXI Modular Chassis

Before starting, prepare the hardware for measurement as detailed previously.

The RF switching system needs to be in a powered LXI chassis and the LXI software must be installed. Plug the RF adapter into the eBIRST Tool and the flying leads onto the connectors of the RF module. If you don't know how to connect the adapter to the modules's connectors, follow instructions up to point 4e and refer to the connection schema.

- 1 Run the eBIRST software.
- 2 Navigate to the **Settings** page.
 - a Select **PiCBControlAddin** driver.
- 3 Navigate to the **Module** page.
 - a Set **Discover module** and **LXI**.
 - b Click on the spyglass icon to discover LXI devices, or fill in the hostname (IP address) of the particular LXI device.
 - c Wait until the module list is refreshed.
 - d If the module list is not populated, make sure the module is properly connected and double check the driver selection on the **Settings** page.
 - e Select the module you want to test.
 - f Select appropriate test definition file under **Test file**.
 - g If there is no test file displayed, the test definition file is missing. The module is either not supported or the test file is broken. Go to the **Settings** page and try to restore the test file to factory settings. If it is still not operational please contact Pickering Customer Support.
- 4 Navigate to the **Tool** page.
 - a Select the appropriate tool in the **Available tools** table and assign it to a connector.
 - b If there is no tool displayed in the table, disconnect & reconnect the eBIRST tool from the USB connector. The tool should appear, if not please contact Pickering Customer Support.
 - c The adapter is automatically recognized upon tool selection.
 - d If the **Adapter** field is red, click on **Check** to get further information about the fault.
 - e Click on the **Connection schema** to get the information of how the adapter should be connected to the module under test. Connect the RF leads according to the schema.
- 5 Navigate to the **Test** page.
 - a Press **Run** at the top of the screen to run the test.
 - b The **Run** button will be grayed out. **Pause** and **Stop** buttons will be highlighted and available for use. Whilst the test is running the top grey bar turns green.
 - c As the test is running, for some modules you can hear clicking as relays are being switched.
 - d Wait for testing process to finish.
 - e When the process finishes a side view of the module's PCB and its relays will be displayed and the table on the right is filled with detailed test data.
 - f Click the relays in view to get to navigate to the relevant table entry.

How to Test a Pickering PXI module in an LXI Modular chassis with the eBIRST Adapter Cable

Before starting, prepare the hardware for measurement as detailed previously.

The RF switching system needs to be in a powered LXI chassis and the LXI software must be installed. Plug the cable adapter into the eBIRST Tool.

- 1 Run the eBIRST software.
- 2 Navigate to the **Settings** page.
 - a Select **PiCBControlAddin** driver.
- 3 Navigate to the **Module** page.
 - a Set **Discover module** and **LXI**.
 - b Click on the spyglass icon to discover LXI devices, or fill in the hostname (IP address) of the particular LXI device.
 - c Wait until the module list is refreshed.
 - d If the module list is not populated, make sure the module is properly connected and double check the driver selection on the **Settings** page.
 - e Select the module you want to test.
 - f Select appropriate test definition file under **Test file**.
 - g If there is no test file displayed, the test definition file is missing. The module is either not supported or the test file is broken. Go to the **Settings** page and try to restore the test file to factory settings. If it is still not operational please contact Pickering Customer Support.
- 4 Navigate to the **Tool** page.
 - a Select the appropriate tool in the **Available tools** table and assign it to a connector.
 - b If there is no tool displayed in the table, disconnect & reconnect the eBIRST tool from the USB connector. The tool should appear, if not please contact Pickering Customer Support.
 - c The adapter is automatically recognized upon tool selection. If the adapter is not recognised then make sure the screw locks are engaged.
 - d Press the check button to recheck for connected adapter.

Note: the following steps **e** to **g** apply to adapter cables only, they do not apply to an adapter PCB.
 - e If it is the first time the cable adapter has been used its resistance must be compensated for by using the **Compensate** button, if has already been used you can select **Use Previous** and proceed to step **h**.
 - f To compensate for the cable adapter you will be prompted to connect the Termination Fixture to the adapter, do so and click **OK**.
 - g The program will perform measurements on the adapter and check that the cable is in good order, remove the Termination Fixture when compensation has completed.
 - h Leaving the adapter connected to the eBIRST tool, proceed to the test page.
- 5 Navigate to the **Test** page.
 - a Press **Run** at the top of the screen to run the test.
 - b The **Run** button will be grayed out. **Pause** and **Stop** buttons will be highlighted and available for use. Whilst the test is running the top grey bar turns green.
 - c As the test is running, for some modules you can hear clicking as relays are being switched.
 - d Wait for testing process to finish.
 - e When the process finishes a side view of the module's PCB and its relays will be displayed and the table on the right is filled with detailed test data.
 - f Click the relays in view to get to navigate to the relevant table entry.

Testing a PXI Module with two or more connectors using two eBIRST Tools

Before starting, prepare the hardware for measurement. The PXI module must be in a powered chassis and recognized by the controller.

- 1 Connect both eBIRST tools as defined in the Getting Started section of this document, connect tools with each other using Slave mode connection cable.
- 2 Run the eBIRST Application program.
- 3 Navigate to the **Settings** page.
 - a Select **PiCBControlAddin** driver.
- 4 Navigate to the **Module** page.
 - a Set **Discover module** and **PXI**.
 - b Wait until module list refreshes.
 - c If the module list is not populated, make sure the instrument is properly connected and double check the driver selection on the **Settings** page.
 - d Select the module you want to test.
 - e Select appropriate test definition file under **Test file**.
 - f If there is no test file displayed, the test definition file is missing. This can occur if the module is either not supported or the test file is broken. Go to the **Settings** page and attempt to restore the test file to factory settings. If the test file is still not displayed please contact Pickering Customer Support.
- 5 Navigate to the **Tool** page.
 - a Select the first tool in the **Available tools** table and assign it to the first connector.
 - b Select the second tool in the **Available tools** table and assign it to the second connector.
 - c If there is no tool available in the table, disconnect & reconnect the eBIRST tool from the USB connector. The tool should appear, if it does not, please contact Pickering Customer Support.
- 6 Navigate to the **Test** page.
 - a Press **Run** at the top of the screen to run the test.
 - b The **Run** button will be grayed out. **Pause** and **Stop** buttons will be highlighted and available for use. Whilst the test is running the top grey bar turns green.
 - c As the test is running, for some modules you can hear “clicking” as the relays are being switched.
 - d If the test requires an eBIRST tool to move to a different connector, the test will pause. An LED on the tool will start flashing, at the same time a window will pop up showing what connector the eBIRST tool needs to be connected to. Connect the eBIRST tool to the new connector and press **OK**. The test will continue.
 - e Wait for the testing process to finish.
 - f When the process finishes, the side view of the module’s PCB is displayed populated with relay states and a table on the right is filled with detailed test data.
 - g Click the relays in the view to navigate to the relevant table entry.

Testing a PXI Module in simulation mode

No hardware is required for this mode. Any hardware that may be connected won't be used.

- 1 Run the eBIRST Application program.
- 2 Navigate to the **Module** page.
 - a Set **Discover module** and **PXI**.
- 3 Navigate to the **Settings** page
 - a Click the **Simulated hardware** button or select **SimulationAddin** in the driver table.
 - b Note the red **Simulation mode** sign at the top of the page, and the button changes to **Real hardware**.
 - c A window will pop up. Select which models you would like to simulate and the information about them then press **Ok**.

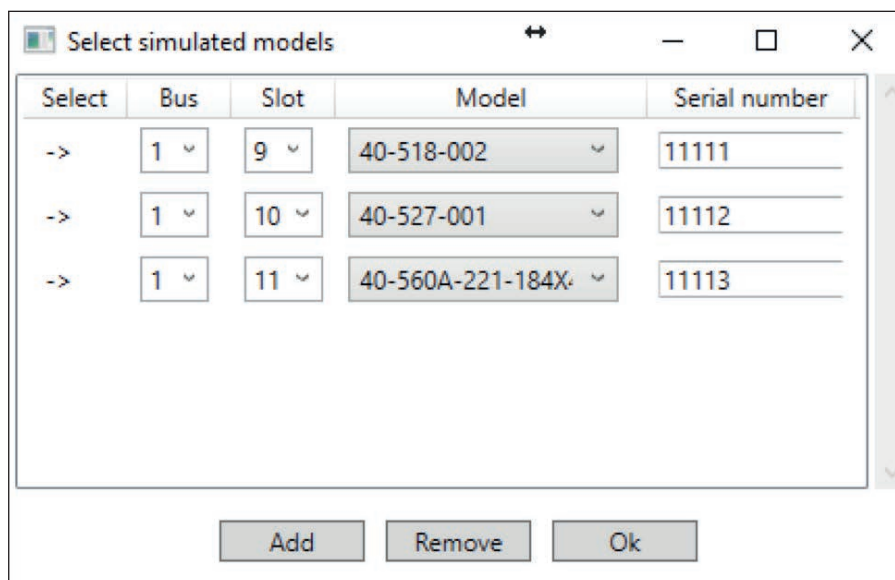


Figure 5.1 - Simulated Models Window

- d Change the values in simulated measurements field. The measured value will be a random number between minimum and maximum. This can be used to simulate errors.
- 4 Navigate to the **Module** page.
 - a Select the module you want to test.
 - b Select the appropriate test definition file under **Test file**.
- 5 Navigate to the **Tool** page.
 - a Appropriate simulated eBIRST tools are already added and everything is setup
- 6 Navigate to the **Test** page.
 - a Press the **Run** button at the top of the screen to run the test.
 - b The **Run** button will be grayed out. The **Pause** and **Stop** buttons will be highlighted and available for use. Whilst the test is running the top grey bar turns green.
 - c If the test requires an eBIRST tool to be moved to a different connector, the test will pause. A window will pop up showing what connector the eBIRST tool needs to be connected to. Since the tools are simulated, just press **Ok** to continue or **Cancel** to stop the test.
 - d Wait for the testing process to finish. The duration is similar to that of a real test.
 - e When the process finishes, the side view of the module's PCB is displayed populated with relay states and the table on the right is filled with detailed test data.
 - f Click the relays in the view to navigate to the relevant table entry.
 - g When simulating, there is an additional slider: **High limit**. This controls the error limit for all measurements.

How to Partially Test the Module

Some modules are very big and testing takes quite long time. To help diagnose these modules, it is possible to test only parts of them (typically whole daughterboards).

- 1 Prepare for test as usual.
- 2 Just before running a test, select which part of test is required to be tested:
 - a Navigate to Test Page.
 - b Click on combo box named **Select Card**.
 - c Unclick checkbox **All selections**.
 - d Click checkboxes for the daughterboards that are required to be tested.
- 3 Press **Run** to start the test.

Note: Daughterboards that have not been selected for the test will have their information unpopulated (both in the application and in the generated report).

How to Generate a Test Report

- 1 Navigate to the **Reports** page.
 - a Choose one of the available report types:
 - b For each type of report you can select which relays are reported. For example only failed relays can be put into the report, or only failed and warnings etc. The Html report has a special option to include a picture of the switching system with relays colored with their status in a similar way to the side view of the switching system on the test page.
 - c To save the report click on **Save**. To view the report click on **View**. To print the report click on **Print**.

How to Compare/Restore Test Definition File

- 1 Navigate to the **Settings** page and go to the **Test files data** at the bottom of the page.
- 2 If the list of the supported modules is not populated click on **Refresh** and wait for the list to be re-displayed.
- 3 Each supported switching system and its test definition file has a status assigned. This status is received by comparing the current test definition file with the factory default one.
- 4 You can restore any of the test definition files to factory default by clicking on **Restore to factory defaults**.
- 5 The change will take effect after eBIRST software re-starts.

How to identify Supported switch modules

- 1 Navigate to the **Settings** page and go to very bottom of the page.
- 2 Click on the **Refresh** button located next to **Test files data** text.
- 3 A list of all test definition files will be shown along with their actual status. All switching systems that are in this list are supported by the eBIRST tool. If your switching system is not in this list, please contact Pickering Customer Support or update the eBIRST application program.

How to Restore Factory Settings

In the unlikely event that the eBIRST configuration data becomes corrupted the following procedure can be followed to restore the factory settings:

- 1 Navigate to the **Settings** page and go to very bottom of the page to **Application data** section.
- 2 It is possible to selectively restore areas of the application, these are:
 - **Application configuration**: eBIRST software settings e.g. port numbers etc.
 - **Test Fixture**: list of available test fixtures and settings.
 - **Adapters**: list of available adapters and settings.
 - **Tool Settings**: list of available tool ranges used for the tool's test and verification.
- 3 Restore the requested area by clicking on **Restore to factory defaults**
- 4 The change will take effect after the eBIRST software re-starts.

Using the Command line tool

The command line tool is an application made to run an eBIRST test in programmatically using eBirstToolCmd.exe in command line mode with appropriate parameters.

Command Line Tool Parameters

The following is a list of parameters can be used by running eBirstToolCmd.exe:

eBirstToolCmd.exe [/I] [/UPDATE] RESOURCE TESTFILE /TOOL1 [/TOOL2] [/C] [/PORT] [/TIMEOUT] [/V] [/RRF] [/OUT] [/DRV] [/O] [/NOR]

Commands	Description
/I	Information about the tool. Use without any other switch and without definition of resource and test definition file.
/UPDATE filename[,md5 hash]	Update of the tool. Use without any other switch except switch for verbose mode.
RESOURCE	VISA resource string describes target device for a test.
TESTFILE.xml	Test definition file name.
/PORT port	RPC port number for LXI access. Default is 1024.
/TIMEOUT timeout	Timeout for communication in ms for LXI access and USB communication. Default is infinite.
/V	Verbose mode. Default is switched off.
/RRF filename	Raw results from test.
/OUT type	Where results should be sent. Possibilities are: "TextReport", "Xml-Report", "HtmlReport", "Screen" or "None" (output to screen; default selection)
/DRV name	Which driver's addin should be used. Name of available addins could be get from information.
/TOOL1 port,[connector],[adapter]	Port name of first tool. As a second information is connector name to which is tool connected. When the instrument has only one connector then the info is optional.
/TOOL2 port,[connector],[adapter]	Port name of second tool (optional; only when the instrument has more connectors). As a second information is connector name to which is tool connected.
/O opt1[,optX]	Test Engine options. It can be: "None", "PauseOnFail", "PauseOn-Measure", "StopOnFail". Default is "None".
/C name[,nameX]	Test categories which are selected. Default is that all categories are selected.
/NOR number[,delay]	Number of repetitions of test. Default is one. Delay value is used between tests and it is in ms. If it is not used then no delay is used.
/USELASTCABLE	When using cable adapter, this tag automatically answers question "Do you want to use last cable compensation value" with "yes".

Note: All required tools have to be connected to the host computer before the test starts.

Typical usage of command line tool is:

```
eBirstToolCmd.exe PXI4::14::INSTR 40-518-002 /TOOL1 com3,DSUB /V
```

This will test a module type 40-518-002 with resource string PXI4::14::INSTR (module in PXI with position bus: 4, device: 14), tool is connected to com3 port, connector on module DSUB.

```
eBirstToolCmd.exe TCPIP::192.168.10.184::b1d14::INSTR 40-518-002 /tool1 com3,DSUB /V
```

This will test a module type 40-518-002 with resource string TCPIP::192.168.10.184::b1d14::INSTR (module in LXI on IP address 192.168.10.184 with position bus: 1, device: 14), tool is connected to com3 port, connector on module DSUB.

```
eBirstToolCmd.exe TCPIP::192.168.10.184::b1d13::INSTR 40-523-022 /tool1  
com3,SCSI,93-002-226 /V
```

This will test a module type 40-523-022 with resource string TCPIP::192.168.10.184::b1d13::INSTR (module in LXI on IP address 192.168.10.184 with position bus: 1, device: 13), tool is connected to com3 port, connector on module SCSI, there is adapter 93-002-226 connected to eBirst tool (96 pin cable adapter).

SECTION 6 - TEST RESULTS ANALYSIS

Relay States

The relay test report will show results in one of the following states:

- **Green:** passed, all measurements were within the limits.
- **Yellow:** passed with warning. Warning limit was breached, but not the main limit. This may indicate that the relay is showing signs of wear but has not failed and is likely to continue to provide a good service life. If other repairs are being conducted a user MAY wish to consider these relays for replacement as a precautionary measure.
- **Red:** failed, measurements either failed or exceeded limits.
- **Transparent:** not tested relay, usually because of category selection or test definition file restrictions.
- **Grey:** ignored, this relay was marked for testing, but actual state of the relay is unknown. This happens when certain conditions do not allow a relay to be tested. For example, if a path through a relay is dependent upon other relays and the tests on those relays has failed.

Using Admin Mode & Creating an Engine Report

The administration mode contains features that in general are not used routinely by users, this is provided primarily for experienced users and Pickering Interfaces support staff. However, if you have problems when testing a switching system you may be asked to enter this mode and in particular provide an Engine Report which is helpful in diagnosing what issues may be present in the test.

How to Engage Admin Mode

- 1 Run eBIRST software.
- 2 Navigate to footer of the eBIRST page. The mode is displayed as: **Debug mode: No**
- 3 Click on **No** and the login screen will appear.
- 4 Enter: **ebirstadmin** and click **Ok**.
- 5 You are now logged in as admin to eBIRST software.

How to generate Engine Report

- 1 Navigate to the **Report** page.
- 2 If you are correctly logged in as admin you have access to the **Engine** report type.
- 3 This report is in XML form and contains detailed information about all measurements and other events that happened during the test procedure. You can **Save**, **View** or **Print** the report.

Utilities Page and eBIRST Tool Verification

After engaging admin mode, new Utilities page will be available:

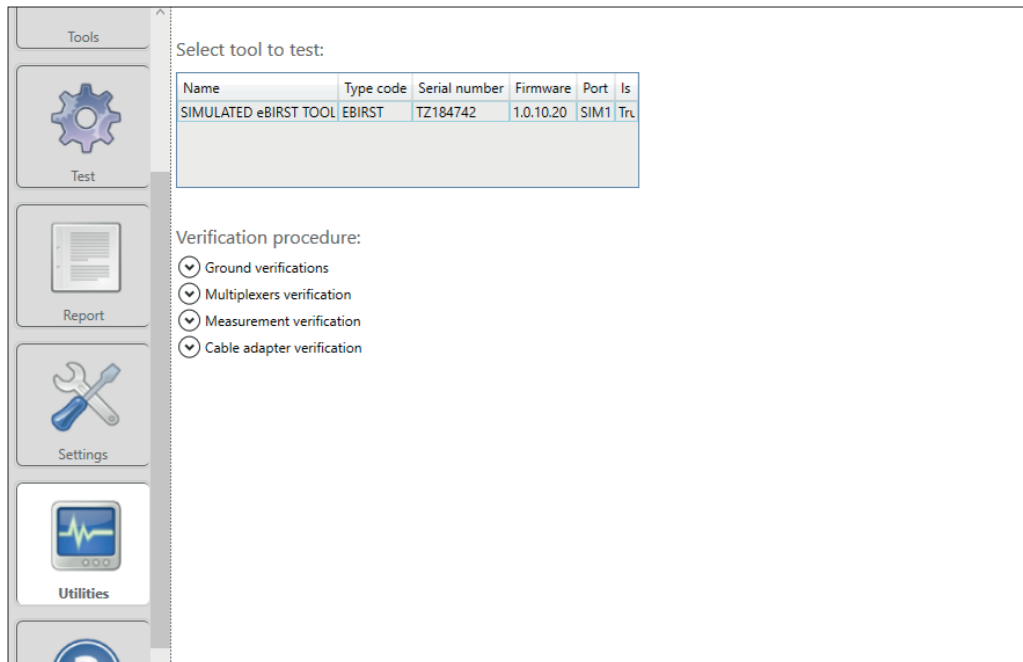


Figure 6.1 - Utilities Page

This page is mainly used for the verification of the of the eBIRST tool's functionality.

First select the tool to be verified in the table.

There are multiple verification procedures:

Ground Verification

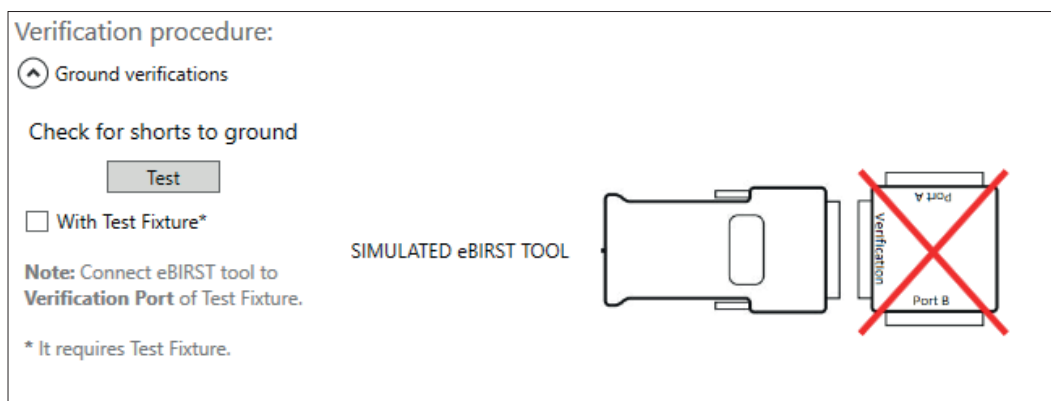


Figure 6.2 - eBIRST Tool Ground Verification

This procedure checks for the possible situation where measurement pins are connected to ground by a malfunction. The first test is done without verification fixture connected (make sure the check box **With Test Fixture** is not checked). Press **Test** button. Next click the checkbox and connect eBIRST tool to the verification port of verification fixture. Press **Test** again. The output window will have more information about possible failures and other information about the test.

Multiplexer Verification

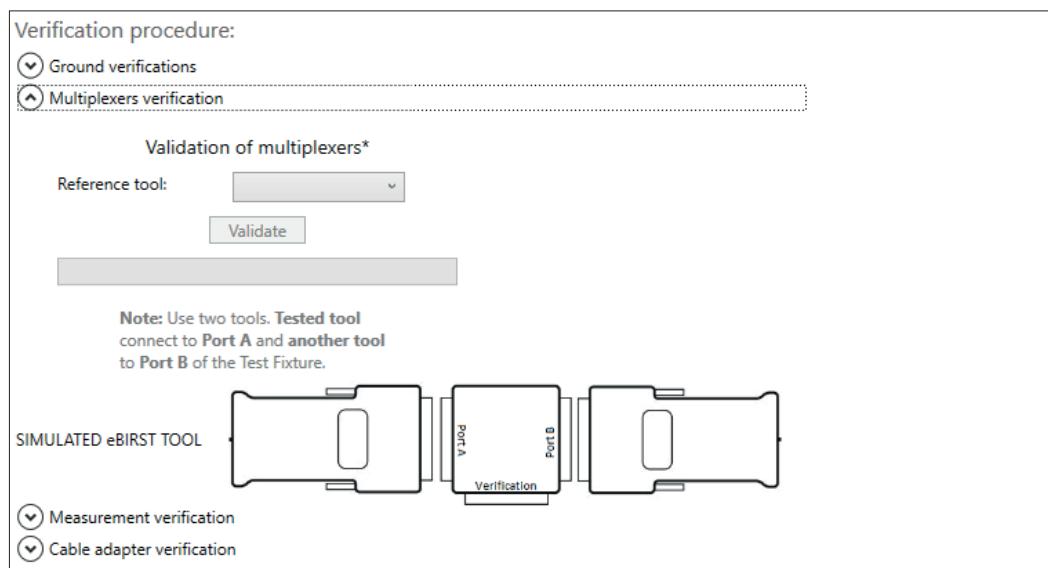


Figure 6.3 - eBIRST Tool Multiplexer Verification

This procedure tests the multiplexers that internally connect the measurement device inside the eBIRST tool to pins on connector. For this test, an additional reference eBIRST tool is needed. Connect the eBIRST tool to be tested to Port A of the verification fixture. Select **Reference tool** in the drop down menu and connect it to Port B. Click **Validate** and see the results in the output window.

Measurement Verification

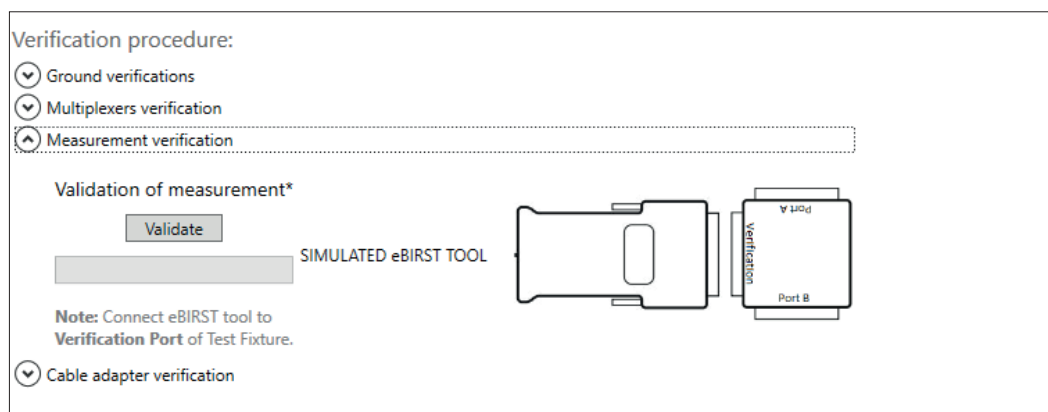


Figure 6.4 - eBIRST Tool Measurement Verification

This procedure makes the eBIRST tool measure the precise resistors in the verification fixture. The program checks if all measurements are within tolerance. There are 4 extra precise resistors that are measured within 0.05% of their nominal value, others are spread accross various pins and those are measured with 0.3% tolerance. The output lists all measurements taken with their results.

Cable Adapter Verification

This procedure verifies the quality of the cable adapter. It is very similar to the Compensation procedure when using a cable adapter in a normal test. The output window shows more information than the Compensation procedure to help diagnose possible issues.

SECTION 7 - MAINTENANCE

Refer to the Warnings and Cautions at the front of this manual



PERIODIC MAINTENANCE

This product does not require any periodic maintenance.

GENERAL CLEANING

- Isolate the electrical power from the chassis and ensure that no user I/O signals are being applied.
- Disconnect the USB lead and connection to the switching system being tested.

SOFTWARE UPDATE

For PXI modules operating in a PXI chassis, no module software updates are required. For the latest version of the driver please refer to our web site pickeringtest.com where links to our Software Download page will provide the latest version of the driver software for the various programming environments encountered.

For PXI modules which are supported in one of Pickering Interfaces' Modular LXI Chassis (such as the 60-102B and 60-103B) no module software update is required. If the module was introduced after the LXI chassis was manufactured the module may not be recognized, in this case the chassis firmware may need upgrading. This is a simple process which is described in the manual for the Modular LXI Chassis.

Verification Procedure

The eBIRST tools do not require routine calibration. However for applications where a verification procedure is required to ensure the tool is working correctly then the following section describes the process by which this can be achieved. In order to use the full process the user should have access to a Verification Fixture for the tool to be tested.

The verification fixtures required are:

Connector	eBIRST Tool	Verification Fixture
200-way LFH	93-002-001	93-002-101
78-way D-type	93-006-001	93-006-101
50-way D-type	93-005-001	93-005-101

With the aid of the verification fixture a user can perform a Basic Test:

- Verify the tool has no shorts to ground.
- Check the accuracy of the eBIRST tool is satisfactory for finding relay faults.

In addition if the user has a second eBIRST tool of the same type a more comprehensive MUX Test can be performed:

- Check the solid state MUX in the eBIRST tool is correctly functioning.

Note. Although useful for diagnosing the nature of a MUX fault such problems will also tend to give incorrect test results on a switching system. The MUX used in the eBIRST tool is only likely to fail if a user applies external signals to it.

The Verification Fixture includes a set of accurate resistors whose resistance can be measured using a user supplied DMM. This section therefore provides instructions to users for verifying the correct operation of the eBIRST tool and a means of testing the eBIRST Verification Fixtures.

In the unlikely event of the eBIRST tool failing any of the tests there are no user serviceable parts and you should contact Pickering Interfaces for further guidance.

To perform the verification tests the eBIRST application program should be installed and running.

Basic eBIRST Tool Test

Start with the eBIRST tool **NOT** connected to the Verification Fixture.

Enable the Admin mode by navigating to the foot of the eBIRST page where the mode is displayed as **Debug mode: No**, click on **No** and a login screen will appear. Enter **ebirstadmin** and click **OK**. You are now logged in to the eBIRST Admin pages and the **Debug Mode** will show as **Yes**.

Select the **Utilities** page of the application program and then select **Verification**.

With the Verification Fixture not connected to the eBIRST tool and **With Test Fixture** box not ticked select **Test**. The application program will run a test looking for shorts to ground. A successful test will be indicated by a message "No pins shorted to ground". If there are failures these will be reported as a list with resistance measurements.

Connect the eBIRST tool to the verification port of the Verification Fixture.

From the **Verification** section select **With Test Fixture** in the tick box and click **Test**.

The application program will run a test that measures four resistors that are connected to ground. To pass all four resistors must be detected and measured successfully and no other connections to ground detected. A pass will be indicated by a list of the measured values of these four resistors.

The next test measures a set of resistors contained in the Verification Fixture and checks these against accurate resistors contained in the eBIRST tool. The Verification Fixture must be connected to the eBIRST tool.

From the Verification section select **Validate** under **Validation of Measurement**. The application program will run a set of tests that includes measurement of precision resistors contained within the Verification Fixture. It should indicate a successful test, if it does not it will list a set of measurement errors.

MUX Test

This test is considered optional as failures in the eBIRST MUX are likely to create failures in other reports. However, this method provides a more comprehensive analysis and may reveal faults on connections not used in tests. To perform this test the user requires two identical eBIRST tools. One tool should be connected to Port A and the other should be connected to Port B. It should be noted that a fault in either eBIRST tool's MUX will produce a failed result.

Connect the eBIRST tools to Port A and Port B of the Verification Fixture. From the verification page under Validation of Multiplexers ensure eBIRST Tool is selected and select **Validate**.

The application program will run a test between the two tools and will either indicate a successful test or will indicate a failure in which case a report can be accessed describing the failure.

Tests Results For eBIRST Tool

This page can be printed and used to record results for an eBIRST tool.

eBIRST Tool Part Number:	
eBIRST Tool Serial Number:	
Date Verification Performed:	
eBIRST Application Program Version Number:	
Operator's Name:	
Test Equipment Used (optional second eBIRST tool):	

Test	Result (delete as appropriate)
Test Without Verification Fixture	Pass / Fail
Test With Verification Fixture	Pass / Fail
Validation of Measurement	Pass / Fail
MUX Test (optional)	Pass / Fail / Not Required

Verification Fixture Validation Test

The Verification Fixture can be tested using a DMM. For each fixture type a circuit diagram is provided in the images at the end of this section. To facilitate the testing of the fixture we recommend the user connects a mating connector to the ports being measured.

R1, R2, R3, R4 Test:

Use a DMM and connect for a four wire measurement to R1, R2, R3 and R4 of the fixture as shown in the circuit diagrams. In each case the resistors are accessed by Pin1 to 4 (R1), Pin 5 to Pin 8 (R2), Pin 9 to Pin 12 (R3) and Pin 13 to Pin 16 (R4). Check that the resistance measured is within $\pm 0.2\%$ of the value noted on the circuit diagram. The result should be recorded.

Note: The initial accuracy of each of these resistors is 0.1%.

R5, R6, R7, R8 Test:

Use a DMM 4 wire measurement to ground (connector shell) for each of these resistors on Pin 17 to Pin 20 respectively and check they are within $\pm 0.1\Omega \pm 2\%$ of the indicated value.

Note: The initial accuracy of these resistors is 1% plus the track resistances.

Resistor Ladder Test:

Use the DMM starting at Pin 21 to Pin 22 and check that the resistance of ladder is $1 \pm 0.2\Omega$, then check resistors in the ladder to the same limit by moving down the connector pin pairs (Pin 22 to Pin 23, Pin 23 to Pin 24 etc.) until the end of the connector and checking each of the resistors is within the same limits.

Thru Path Test on Verification Fixture

This test is a functional test only and is not required if no full functional checks of the MUX is required. It performs a check on the thru path between Port A and Port B. If the Verification Fixture has successfully performed tests on eBIRST MUXs then the test is not required.

Use a DMM to check that there is a thru path between Port A and Port B by checking for continuity between Port A Pin 1 and Port B Pin 1, Port A Pin 2 and Port B pin 2 etc for the entire connector. It is sufficient to use a buzzer as an indicator of continuity.

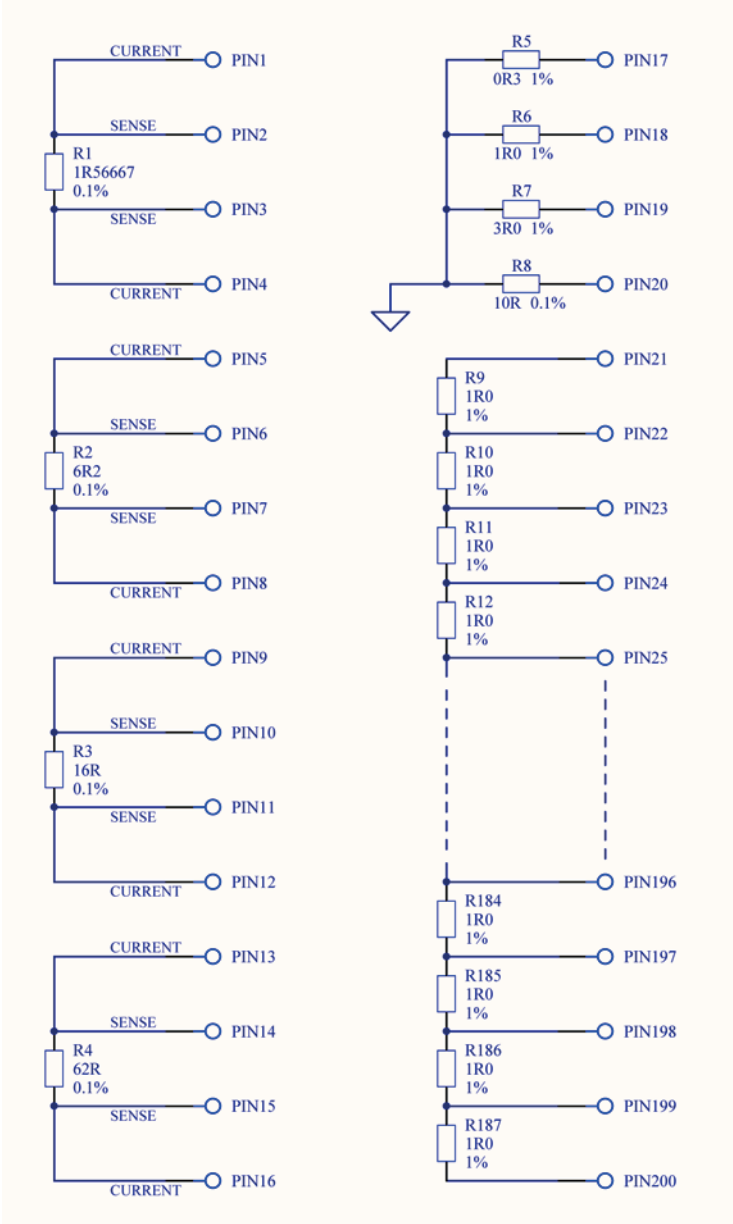


Figure 7.1 – Verification Port of the Fixture for 200 Way LFH Connector (93-002-101)

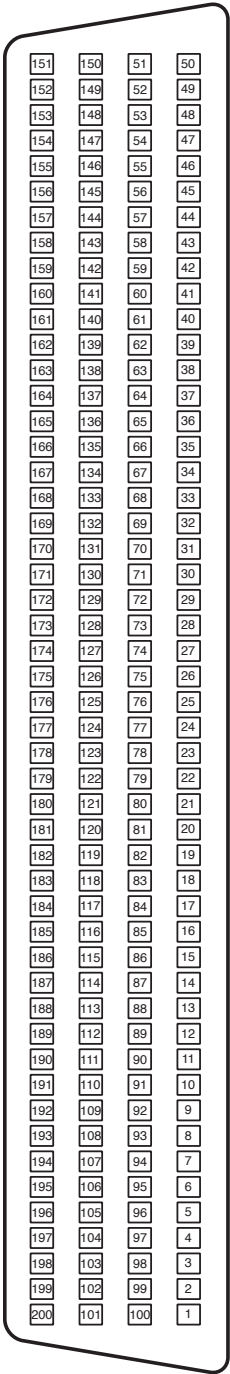


Figure 7.2 – Verification Port Pin Numbering (200-Way Female LFH Connector)

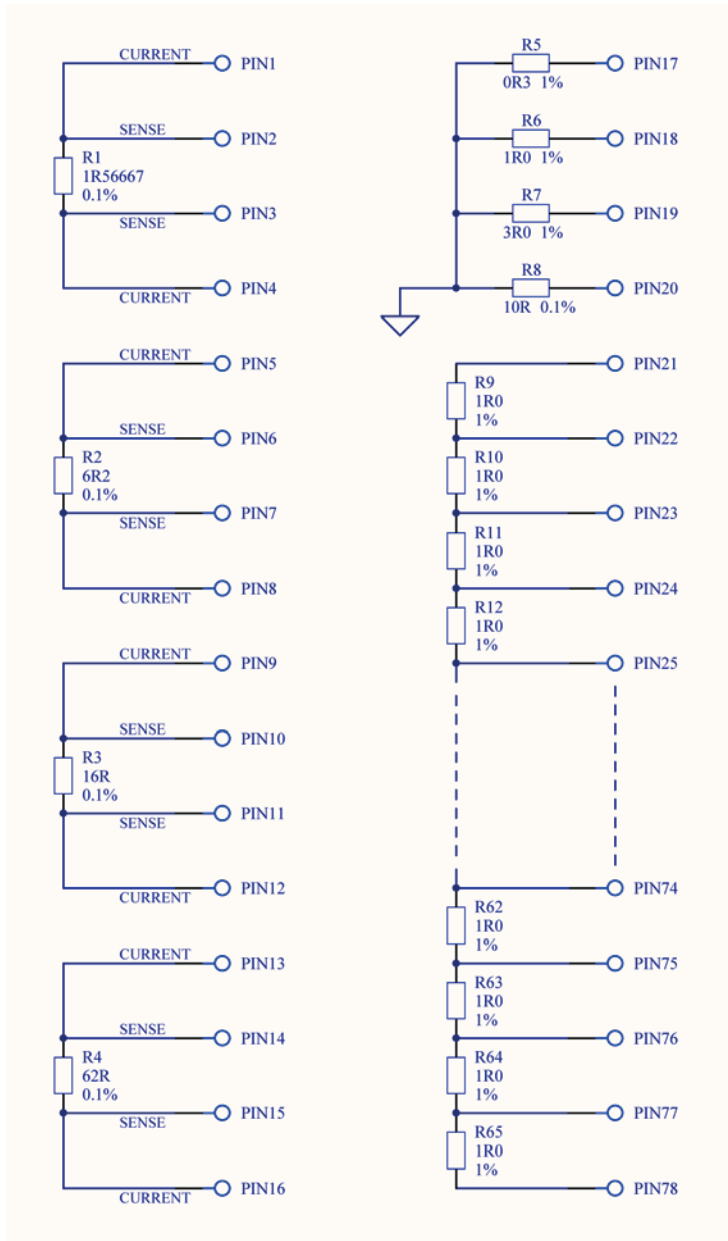


Figure 7.3 – Verification Port of the Fixture for 78-Way D-Type Connector (93-006-101)

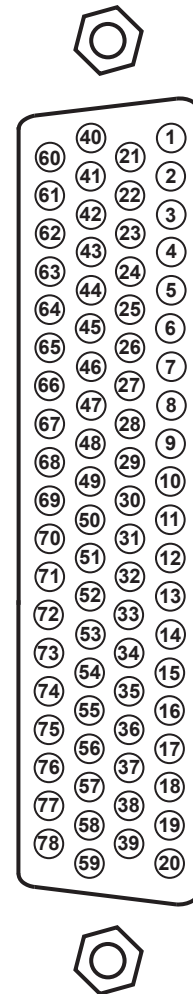


Figure 7.4 – Verification Port Pin Numbering (78-Way Male D-Type Connector)

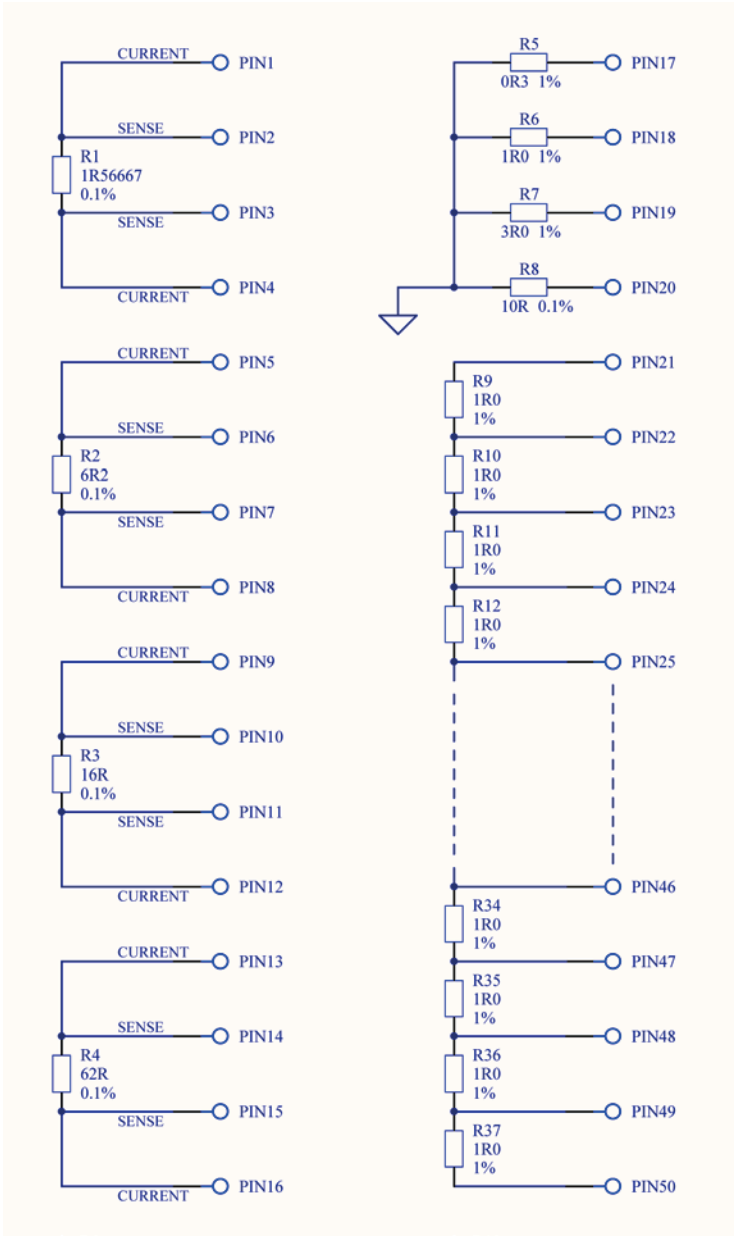


Figure 7.5 – Verification Port of the Fixture for 50-Way D-Type Connector (93-005-101)

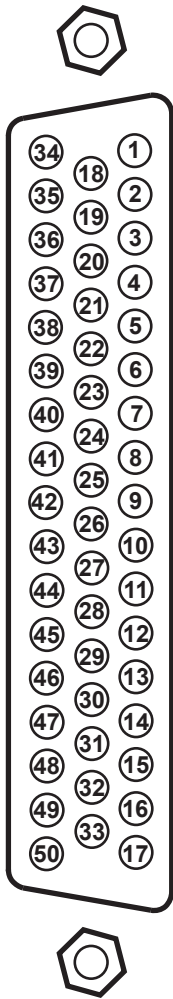


Figure 7.6 – Verification Port Pin Numbering (50-Way Male D-Type Connector)

Tests Results For Verification Fixture

This page can be printed and used to record results for an eBIRST tool.

eBIRST Verification Fixture Part Number:	
eBIRST Verification Fixture Serial Number:	
Date verification performed:	
Operator's Name:	
Test Equipment Used (optional second eBIRST tool):	

R1, R2, R3, R4 Test

Resistor	Value	Range	Measured Value	Result (delete as appropriate)
R1	1.56667Ω	1.563Ω to 1.570Ω		Pass / Fail
R2	6.2Ω	6.187Ω to 6.213Ω		Pass / Fail
R3	16Ω	15.968Ω to 16.032Ω		Pass / Fail
R4	62Ω	61.876Ω to 62.124Ω		Pass / Fail

R5, R6, R7, R8 Test

Resistor	Value	Range	Measured Value	Result (delete as appropriate)
R5	0.3Ω	0.194Ω to 0.406Ω		Pass / Fail
R6	1Ω	0.88Ω to 1.12Ω		Pass / Fail
R7	3Ω	2.84Ω to 3.16Ω		Pass / Fail
R8	10Ω	9.7Ω to 10.3Ω		Pass / Fail

Resistor Ladder Test

Test	Result (delete as appropriate)
Resistor Ladder Test	Pass / Fail

Thru Path Test

Test	Result (delete as appropriate)
Thru Path Test	Pass / Fail

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