ECU Test System Maintenance Software

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Test System Maintenance Software Manual

The Test System Maintenance Software Manual contains reference information about monitoring and performing maintenance operations on components of your test system.

Top Tasks

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View a detailed report with the results of maintenance operations performed on your test system.	Go to the application **Reports** page.
Configure Test System Maintenance Software settings.	Go to the application **Settings** page.

Important Concepts

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What do you want to learn?	Where to go
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Maintenance Operations

Select the operations you want the Test System Maintenance Software to run by clicking the **Gear** button (⚙) in the **Home** page and checking the boxes of the operations you want to perform.

Note You cannot change the settings in the **Run Configurations** panel while executing operations. Some operations require several minutes to run and cannot be canceled while running. The **Verify System Configuration** operation always executes before any other operations.

Verify Components

The **Verify Components** operation detects test system components discoverable by the Test System Maintenance Software and compares the results to the system configuration file to generate a list of test system components.

The **Verify Components** operation generates a list of the following:

- Name changes
- Missing components

- Components with problems
- Components not expected but found
- Missing Ports
- Ports with problems
- Ports not expected but found

Note You must run the **Verify Components** operation after enabling the **Renaming Components** or **Configuring Switch Terminal Blocks and Topologies** settings before the settings will take effect.

Related tasks:

- Renaming Components
- Configuring Switch Terminal Blocks and Topologies

Related reference:

- COM Port Binding

Reset

Use the **Reset** operation to reset test system components.

The **Reset** operation initializes components to the power-on state. Resetting also clears the status of a component that exceeded a threshold such as temperature operating range.

Note Before running the **Reset** operation, make sure no other operations are running on the test system as the driver may need exclusive access to component resources.

Note This operation is not supported on all devices.

Self Test

Use the **Self Test** operation to verify baseline functionality of test system components. The level of verification varies by component, but minimally, this operation verifies that the system controller can communicate with the component.

Before running the **Self Test** operation, make sure no other operations are running on the test system as the driver may need exclusive access to component resources.

Note This operation is not supported on all devices.

Self-Calibrate Components

The **Self-Calibrate Components** operation performs self-calibration on test system instruments by verifying an instrument against an onboard standard and adjusting the performance of the instrument to compensate for any discrepancies.

Typically, you perform self-calibration in the same environment in which you use the instrument. By doing so, the self-calibration operation can compensate for factors such as ambient temperature and time drift.

Note Before running the **Self-Calibrate Components** operation, make sure no other operations are running on the test system as the driver may need exclusive access to instrument resources.

Note This operation is not supported on all devices.

Get Calibration and Temperature Information

The **Get Calibration and Temperature Information** operation returns the following information for each test system component:

Note This operation is not supported on all devices. Some devices may not support all the information listed below. For example, PXI controllers can report current temperature, but cannot provide calibration information.

- **External Calibration Date**—The date of the most recent external calibration.
- **External Calibration Temperatures**—The temperature of the most recent external calibration.
- **Recommended External Calibration Interval**—The recommended period between external calibrations.
- **Self-Calibration Date and Time**—The date and time of the most recent self-calibration.
- **Self-Calibration Temperatures**—The temperature of the most recent self-calibration.
- **Current Temperatures**—The current component temperature.

A blank entry in the table indicates that the component does not provide that data.

Check Continuity

The **Check Continuity** operation ensures all components that shipped with the test system are correctly routed to their assigned pins in the mass interconnect. When running this operation, Test System Maintenance Software prompts you to connect an FDT.

Renaming Components

Component names must match those present in your system configuration file. Test System Maintenance Software operations may not run properly if the names do not match. For example, if you reset the NI MAX database or manually change a resource name or alias from the default NI designated name, Test System Maintenance Software may not recognize a component. The **Renaming Components** setting ensures test system component names match the names specified in the system configuration file. You must run the **Verify Components** operation after enabling this setting for the changes to take effect.

Complete the following steps to enable **Renaming Components**.

1. Go to the Settings page in Test System Maintenance Software and click the **Renaming Components** checkbox.
2. Run the **Verify Components** operation to automatically rename and detect test

system components.

Related concepts:

- Verify Components

Configuring Switch Terminal Blocks and Topologies

Switch terminal blocks delivered with NI systems are configured to associate with the switch modules specified in the system design. Some NI switch terminal blocks used with NI PXI switches cannot be detected by software. For example, the TB-2640B switch terminal block used with the PXIe-2532B switch module cannot be detected by software. Test System Maintenance Software may not operate correctly if you alter the configurations of these undetectable switch terminal blocks in NI MAX. Enabling **Configuring Switch Terminal Blocks and Topologies** ensures that the configuration of these switch terminal blocks matches the original system design.

Note This setting only applies to the following switch terminal blocks that cannot be detected by software, which are associated with the PXIe-2532B device. If your system does not contain any of the following switch terminal blocks, you do not need to enable this setting,

- TB-2640B
- TB-2641B
- TB-2642B
- TB-2643B
- TB-2644B
- TB-2645B
- TB-2646B

Note Continuity tests for the PXIe-2532B will result in a failure when the topology of the switch terminal block does not match that of the switch terminal block specified in the original system design.

When you enable the **Configuring Switch Terminal Blocks and Topologies** setting, Test System Maintenance Software restores the switch terminal block to the configuration originally specified in the system design in NI MAX. To enable this setting, complete the following steps.

1. Go to the Settings page in Test System Maintenance Software and click the **Configuring Switch Terminal Blocks and Topologies** checkbox.
2. Run the **Verify Components** operation to verify that Test System Maintenance Software detects the terminal switch block.

Note You must run the **Verify Components** operation after enabling this setting for the changes to take effect.

Related concepts:

- Verify Components

Terminal Block Topologies

Some NI switch terminal blocks support both 1-wire and 2-wire topologies. Read the following to learn more about using switch terminal blocks with Test System Maintenance Software.

Supported Topologies for NI Switch Terminal Blocks

The following table shows the supported topologies for NI switch terminal blocks designed for use with the PXIe-2532B switch matrix device.

Note When viewing the following switch matrix modules and switch terminal blocks in NI software, the "B" does not appear in the device name. For example, if you are using a TB-2646B switch terminal block in your system, it appears as a TB-2646 switch terminal block when viewed in NI MAX.

Switch terminal block name	Supports 1-wire topology	Supports 2-wire topology
TB-2640B	Yes	No

Switch terminal block name	Supports 1-wire topology	Supports 2-wire topology
TB-2641B	Yes	No
TB-2642B	Yes	No
TB-2643B	Yes	Yes
TB-2644B	Yes	Yes
TB-2645B	Yes	Yes
TB-2646B	Yes	Yes

Running Verify Components Operations

If you enable the **Configuring Switch Terminal Block Topologies** setting in Test System Maintenance Software and run the **Verify Components** operation, Test System Maintenance Software will do one of the following for each switch terminal block in your system:

- If the switch terminal block type matches the switch terminal block type specified in the original system design, Test System Maintenance Software will not change the switch terminal block topology. For example, if you deliberately set a switch terminal block to use a 2-wire topology in NI MAX, Test System Maintenance Software will not change this configuration while running **Verify Components** with **Configuring Switch Terminal Block Topologies** enabled if the switch terminal block is the appropriate type to use with the associated switch device.
- If an incorrect switch terminal block type is configured in NI MAX, or if no switch terminal block type is configured, Test System Maintenance Software will configure the switch terminal block selected when the system was designed, and configure the switch terminal block to use a 1-wire topology.

> **Note** If you need to use a 2-wire topology for a switch terminal block, you must configure this setting in NI MAX.

Running Continuity Test Operations

Continuity tests for the PXIe-2532B will result in a failure when the topology of the switch terminal block does not match the topology specified in the original system design for that switch terminal block.

Reports

The Test System Maintenance Software generates a report containing information about the test system each time you run operations.

The generated report displays information from the operations selected in the Home page. To view the most recent report, and a list of previous reports, go to the Reports page. You can configure the number of reports Test System Maintenance Software stores in the Settings page.

Note The default value of saved reports is 15,000.

Note Report file names are formatted specifically by Test System Maintenance Software. Changing report file names will result in inaccessible reports or misrepresentation of available reports.

The report contains the following information:

- **Overall Status**—Outcome of the maintenance operations, including information about operations that failed.
- **General Information**—Table listing report start and end date, as well as the system configuration name, model name, part number, serial number, and system tag.
- **System Configuration Verification Summary**—Results of the Verify System Configuration operation.
- **System Components — General Information**—Table listing the hardware present in the test system, as well as the hardware's name, part number, serial number, firmware version, and location in the test system.
- **System Ports — General Information**—Table listing the ports present in the test system, as well as the port name, type, and location in the test system.
- **System Components — Operations Performed**—Table detailing the operations executed on each component and the component's status. Reported values include the following:
  - `Passed`—The test for this component passed.
  - `Failed`—The test for this component failed. Refer to the report footnote for additional details.
  - `N/A`—The operation is not supported for this component.

- **System Components — Calibration Information and Current Temperatures**—Table detailing the external calibration date, external calibration temperature, recommended external calibration interval, self-calibration date and time, self-calibration temperatures, and current temperatures.

COM Port Binding

Configure COM port bindings to be consistent with your system design.

Test System Maintenance Software detects errors in your system configuration, including incorrect COM port binding assignments. The Verify System Configuration operation checks whether your COM port bindings match your system configuration file.

After running the operation, check for errors in the generated report. If a COM port in the system has a port number that does not match the system definition, Test System Maintenance Software will log the following error under the Ports with Problems section of the report:

```
The serial port binding, COM{#}, does not match the serial port binding from the
system definition, COM{#}.
Automatic adjustment of serial port bindings is not supported.
See the help file for details on how to manually modify serial port bindings.
```

Refer to the following topics for instructions on how to correctly configure COM port bindings to resolve these errors:

- PXI Controller COM Port Binding
- NI Serial Module COM Port Bindings

Note If you need to assign a COM port binding to a port already in use, make temporary assignments to an unused COM port.

Related concepts:

- Verify Components

PXI Controller COM Port Binding

Configure PXI Controller COM ports to be consistent with your system design if the System Verification operations reports a COM port number assignment error. Read the following instructions for information on how to correctly assign a PXI controller port number.

1. Open Windows Device Manager.
2. Select **Ports** » **Communications Port**, and right-click to select **Properties**.
3. Click **Advanced...** and select a port binding from the **COM Port Number** drop-down list.

> **Note** When swapping COM port number assignments between two ports, set one of them to an unused port number first to avoid setting two ports to the same port number.

> **Note** If you get an error when changing the COM port number, reboot the machine and try again.

After configuring new port bindings, close the **Properties** window, right-click the **Communications Port** in Windows Device Manager, and select **Scan for Hardware changes** to apply changes.

Open the NI Max application and expand the **Devices and Interfaces** section and verify the COM port number updates for your device.

> **Note** These final steps are necessary for your new COM port number bindings to be visible to Test System Maintenance Software.

NI Serial Module COM Port Binding

Configure NI Serial Module COM ports to be consistent with your system design if the System Verification operations reports a COM port number assignment error. Read the following instructions for information on how to correctly assign an NI serial module port number.

1. Run the NI MAX application as an administrator by right-clicking the application shortcut and selecting **Run as Administrator**. You must run the application as an

administrator to enable COM port number changes.
2. Select the COM Port you want to update.
3. Click on the **Advanced** tab.
4. Change the COM port binding from the **COM Port Number** drop-down list.

> **Note** When swapping COM port number assignments between two ports, set one of them to an unused port number first to avoid setting two ports to the same port number.

> **Note** If you get an error when changing the COM port number, reboot the machine and try again.

Save changes by clicking **File** » **Save**.

Environment Reference

Test System Maintenance Software UI consists of a single window containing a File menu, Help menu, Home page, Report page, and Settings page.

File Menu

The File menu contains the following options:

- **Open Report Folder...**—Opens a directory of previously generated reports.
- **Exit**—Exits the Test System Maintenance Software.

Help Menu

The Help menu contains the following options:

- **Test System Maintenance Help...**—Launches the Test System Maintenance Software Help.

Home

The Home page contains the following information:

- Recent Maintenance History — A list of links to the most recent reports created.
- System Information — Details about your system.
- Run Maintenance — Configure your system maintenance operations.
  - Maintenance Operations — Click the Gear button to select which maintenance operations you want to perform on your test system.
  - Run Operations — Click to run the selected operations.
  - Component List — Click the top box to run maintenance operations on all components or select individual components from the list.

Reports

The Reports page contains the overall result of operations run on your test system, as well as information on system configuration, system components, and detailed information about each operation run.

Settings

The Settings page contains information about Test System Maintenance Software. You can also use this page to configure settings like the number of reports stored, naming of test system components, and configurations of switch terminal block components.