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**FP-1600**

# LabVIEW™ Datalogging and Supervisory Control Module Release Notes

## Version 7.1

This document describes installation, known issues, new features, upgrade steps, and more for the DSC Module version 7.1. For recent information not included in these release notes, refer to the `dsc_readme.html` file in the LabVIEW directory.

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# System Requirements

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The DSC Module runs on any system with the following minimum specifications:

- Windows 2000/NT 4.0 or later/XP. The DSC Module requires that Windows NT include service pack 6a and the 6a Security Rollup Package, which are part of the July 26, 2001 security update available at [www.windowsupdate.com](http://www.windowsupdate.com). LabVIEW 7.1 does not support Windows Me/9x.
- 800 MB of disk space to install LabVIEW and the DSC Module and have swap space available. Increasing computer resources has a significant effect on performance of DSC Module applications.
- Version 7.1 of the LabVIEW Full or Professional Development System. Refer to the *LabVIEW Release Notes* for LabVIEW system requirements.

## Protecting Against Power Failure

Power failure is a potential threat to system stability. If a computer loses power suddenly, data kept in memory is lost and files might be corrupted. The only effective protection against power failure is an Uninterruptible Power Supply (UPS). A UPS is a device that keeps the computer running for at least a short time when the primary power source is lost. It provides complete isolation between the AC power source and the computer and has backup battery power in case of power outages. If you do not need battery backup, you can use a quality surge protector to protect a computer from most electrical surges and spikes.

## Compatibility Issues

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The following sections describe compatibility issues for version 7.1 of the DSC Module.

### VI Compatibility

If you are upgrading from a previous version of LabVIEW, existing VIs are automatically converted and compiled when you open them, and you are prompted to save. A VI saved in the DSC Module version 7.1 no longer loads in an earlier version.

### Citadel Database Compatibility

The DSC Module version 7.0 introduced Citadel 5, a new version of the historical database. The current DSC Module logs to and retrieves from Citadel 5 databases only. You must convert Citadel 3.8 or Citadel 4.x

databases to Citadel 5 if you want to use them with version 7.1 of the DSC Module. Refer to the [Converting Citadel 4.x Databases](#) section of this document for information about converting databases.

## NI-DAQ Software Compatibility

If you want to use NI-DAQ with version 7.1 of the DSC Module, you can use either Traditional NI-DAQ or NI-DAQmx, but not both at the same time. If you use Traditional NI-DAQ, you can use DAQ OPC. You cannot use NI-DAQmx with OPC. To use NI-DAQmx, you must use the DAQ VIs with memory tags.

If you have trouble with a Traditional NI-DAQ application after upgrading to version 7.1 of the DSC Module, make sure the DAQ OPC server is installed. Perform a custom installation from the NI-DAQ installation CD to install DAQ OPC. The DSC Module installation CD does not include the DAQ OPC server.

## Installation

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### Before You Install

Review the following list of issues before you install the DSC Module:

- You must install version 7.1 of the LabVIEW Full or Professional Development System before you install the DSC Module. If you reinstall LabVIEW 7.1 after installing the DSC Module, you must reinstall the DSC Module.
- Make sure that you meet the system requirements listed in the [System Requirements](#) section of this document and in the *LabVIEW Release Notes*.
- If you have a previous version of the DSC Module installed, either uninstall that older version or install version 7.1 in a different directory. Due to a change in Citadel, you must install a patch for version 7.0 of the DSC Module if you want to run both version 7.0 and 7.1 on the same computer. The patch for version 7.0 is located on the installation CD in the *Simultaneous Operation Patch* folder.
- If you want to preserve custom settings from a previous installation of the DSC Module, save all `.ini` and `.cfg` files in the LabVIEW directory to a backup location and then return them to the appropriate location after installing version 7.1.

- If you want to preserve custom images you have stored in Image Navigator, back up custom .cat files before upgrading to version 7.1 of the DSC Module and then return them to the appropriate location after installing version 7.1.
- If you have Microsoft SQL Server version 6.5 or earlier installed on the computer, you must upgrade to Microsoft SQL Server version 7.0 or later before installing the DSC Module.

## Installing the DSC Module

Complete the following steps to install the DSC Module.

1. Install LabVIEW 7.1 if you have not already done so. Refer to the *LabVIEW Release Notes* for information about installing LabVIEW.
2. After installing LabVIEW and before installing the DSC Module, restart the computer and log on as an administrator or as a user with administrator privileges.
3. Insert the DSC Module CD in the CD-ROM drive and follow the instructions that appear on the screen.
4. Restart the computer and log on as an administrator or as a user with administrator privileges. When you restart, you might have to wait for the MSDE setup to complete.
5. (Optional) Launch LabVIEW and change the default palette view to access the DSC Module palettes: select **Tools»Options**, select **Control/Function Palettes** in the pull-down menu, and choose the **Advanced** palette view. The DSC Module palette icon is shown at left.



## Uninstalling the DSC Module

To uninstall version 7.1 of the DSC Module, select **Start»Settings»Control Panel»Add/Remove Programs**. Select **National Instruments Software** and remove **NI LabVIEW DSC Module 7.1**.

## New Features for Version 7.1

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The following sections describe changes to existing features and new features added in version 7.1 of the DSC Module.

### New Delete Database VI

Version 7.1 of the DSC Module includes a new Delete Database VI on the **Historical Data** palette. The Delete Database VI programmatically removes the logical connection between the DSC Module and a Citadel database, removes all Citadel-related files from their specified storage

location, and removes the database directory unless non-Citadel files exist there.

## DataSocket Connection Enhancement

Version 7.1 of the DSC Module includes an enhancement to DataSocket. If a DataSocket client loses a connection to the DataSocket Server or cannot establish a connection to the DataSocket Server, the DataSocket Proxy attempts to reconnect every 60 seconds by default. The DataSocket Proxy can reconnect to the DataSocket Server automatically, and the Tag Engine does not need to be restarted. To use a reconnection interval other than 60 seconds, create a file named `DataSocket.ini` in the `vi.lib\lvdsc\servers\DataSocket Proxy` directory. Create the following keys in the `DataSocket.ini` file:

```
ReadReconnection=x  
WriteReconnection=x
```

where `x` is the reconnection interval in seconds.

## Changes to the HMI Wizard for Historical Trends

The HMI Wizard behavior for the **Historical Trend** has changed slightly with version 7.1 of the DSC Module. Previously, when you used the HMI Wizard with a **Historical Trend** and selected **Database Name** as the **Data Source** of the tags, the HMI Wizard replaced `\\computername\` in the trace path with `\\localhost\` if `computername` matched the current computer. In version 7.1, the HMI Wizard does not automatically make this change. Traces appear exactly as they exist in the database.

When **Data Source** is set to **SCF File** in the HMI Wizard for Historical Trends, a new **Use 'localhost' in URL?** checkbox is available. Place a checkmark in this checkbox to replace `\\computername\` with `\\localhost\` when **Data Source** is set to **SCF File**. If a checkmark exists in the **Use 'localhost' in URL?** checkbox and you switch between **SCF File** and **Database Name**, you might see tags in the **Tag List** marked as invalid. If you see a circle with a slash, shown at left, next to a tag in the **Tag List**, delete the tag and add it again to fix the problem.



# New Features for Version 7.0

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The following sections describe changes to existing features and new features added to version 7.0 of the DSC Module.

## Citadel 5 Database

The DSC Module versions 7.0 and 7.1 include Citadel 5, a new version of the Citadel historical database. Citadel 5 introduces data access from ActiveX Data Objects (ADO) clients and improved Open Database Connectivity (ODBC) support.

### Database Names

Citadel 4.x identified databases exclusively by their path. Citadel 5 uses database names. Because of the new Citadel 5 format, the Historical Data VIs have been modified, the Tag Configuration Editor uses a new `.scf` file format, the ODBC data source setup has changed, and the Historical Data Viewer has been updated.

### Conversion to Citadel 5 Format

The DSC Module versions 7.0 and 7.1 log to and retrieve from Citadel 5 databases only. You must convert Citadel 3.8 or 4.x databases to Citadel 5 if you want to use them with the current DSC Module. Refer to the [Converting Citadel 4.x Databases](#) section of this document for information about converting databases.

### Citadel 5 ODBC Data Source

As with Citadel 4.x, you must have an ODBC data source for Citadel 5 as described in the *LabVIEW Help*. However, the following changes have been made to the **National Instruments Citadel ODBC Setup** dialog box:

- ODBC setup asks for a **Database URL** instead of a database path. **Database URL** is the computer and database name where data for the source are stored—for example, `\\computer_name\my_database`. Use a **Database URL** that matches the existing local or remote database you intend to access.
- Use the **...** button to browse local and remote databases.
- Use the **Test Connection** button to test the connection you are setting up.

## Expanded Access to Citadel 5 Data

The Citadel 5 ODBC driver is compliant with SQL 92 and ODBC 2.5 standards. All clients that follow these standards can retrieve data from a Citadel 5 database. ADO clients can access the Citadel 5 database using the ODBC driver through the Microsoft OLE DB Provider for ODBC Drivers. You can use a Microsoft Query Wizard to build queries.

## Creating a Data Link for the ODBC Data Source

If you want to access Citadel data from an ADO client, you need a data link to ODBC. You might be able to create the data link from within an ADO client, but you might be required to create it multiple times. Alternatively, complete the following steps to create a data link once that you can store on a system or network.

1. Create a Citadel 5 ODBC data source if you have not already done so.
2. Create a new text (.txt) document.
3. Right-click the new text document and rename it to have a .udl extension, for example `data_link.udl`. A warning might appear, explaining that changing file extensions might cause files to become unusable. Disregard this warning.
4. Right-click the .udl file and select **Properties**. In the dialog box that appears, click the **Provider** tab and select **Microsoft OLE DB Provider for ODBC Drivers**.
5. Click the **Connection** tab and select the Citadel 5 ODBC data source name.
6. Click the **OK** button.

## Citadel 5 Tables

Citadel 5 tables are different than Citadel 4.x tables. For more information about Citadel 5 tables, refer to the [Updating Citadel 4.x SQL Queries](#) section of this document.

## Storage and Security for Alarms and Events

Citadel 5 uses Microsoft SQL Server or MSDE 2000 (Microsoft SQL Server Desktop Engine 2000) to store alarms and events. MSDE 2000 is a light version of Microsoft SQL Server. The major restriction of MSDE 2000 is that the size of one database is limited to 2 GB, so you must upgrade to the full version of SQL Server 2000 if an application exceeds this 2 GB limit.

To connect to and access a remote SQL Server database, local and network clients can use one of two security modes: Windows Authentication Mode or Mixed Mode. Windows Authentication Mode security uses the built-in

Windows security system and takes advantage of Windows NT domains. All clients that need to access SQL Server remotely must be properly configured on the same domain to access data stored on remote SQL Server computers. Clients must connect through the Windows security system on the server.

Mixed Mode security allows clients to connect to a server using either Windows Authentication or SQL Server Authentication. With SQL Server Authentication, all user accounts are stored within the SQL Server, and clients do not need to go through the built-in Windows NT security system. Mixed Mode security is simple to set up because clients need not be on the same domain. They only need to have the correct user name and password to access the SQL Server. However, SQL Server Authentication is more vulnerable than Windows Authentication Mode.

Citadel 5 uses SQL Server Authentication by default, so network clients do not need to be explicitly configured. The DSC Module installer enables Mixed Mode security on existing SQL Servers or installs MSDE 2000 with Mixed Mode security if the target computer does not have SQL Server installed.

The default password for the SQL Server administrator `sa` is left blank. NI recommends that you assign a strong password to the `sa` user. Use the following command line utility to set the SQL Server administrator password:

```
osql -U"sa" -P"" -Q"sp_password NULL, 'new_password', 'sa'"
```

Use the following command to change an existing password:

```
osql -U"sa" -P"old_password" -Q"sp_password 'old_password',  
'new_password', 'sa'"
```

If Mixed Mode security is not acceptable, change both the SQL Server and Citadel login modes by setting the registry `DWORD` values `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\MSSQLServer\MSSQLServer\LoginMode` and `HKEY_LOCAL_MACHINE\SOFTWARE\National Instruments\Citadel\5.0\IntegratedSecurity` to 1. This forces the use of Windows Authentication mode.

NI recommends changing the login mode immediately after installing the DSC Module. If you change the login mode after you have logged data, you must reattach all existing Citadel databases. Restart the SQL Server and Citadel services to implement the changes. If you use Windows Authentication Mode, remember that you might need to explicitly configure the server computer and all clients.

## Revised Historical Data VIs

Version 7.0 of the DSC Module introduced several changes to the VIs on the **Historical Data** palette:

- Doubles that were formatted as **show date & time** are replaced by the LabVIEW time stamp data type.
- Read Trace and Read Traces VIs are polymorphic for output trace type and include a new **timeout** parameter.
- Read Trace and Read Traces VIs allow interpolation. Previously, the **interpolate through gaps** parameter for the Read Trend and Read Trends VIs, if set to TRUE, removed gaps/breaks. The **interpolate data** subparameter in the **options** parameter now calculates interpolations, which can slow down data retrieval. To only remove gaps/breaks, use the **remove data breaks** subparameter of the **option** parameter instead of **interpolate data**.
- A **maintain trending info** option is included for the Read Trace and Read Traces VIs. If this option is set to TRUE, the returned trace includes the first data point before **start timestamp** and the last data point after **stop timestamp**. If the option is set to FALSE, the returned trace includes only points between the start and stop time stamp.
- The Detach Database VI allows you to programmatically remove the logical connection between the DSC Module and a Citadel database. You might want to detach a database to move or rename database files without causing errors. Also, you should detach all local databases before renaming the host computer. A detached database does not show up in the Citadel 5 Universe tree view in Historical Data Viewer.
- The Make Network Path VI and Split Network Database Path VI are no longer on a palette because the DSC Module no longer uses database paths.
- The VIs have new icons.

If you have a DSC Module 6.x application that uses the Historical Data VIs, you do not need to replace them unless you want to take advantage of the new functionality. However, previous Historical Data VIs are renamed automatically to `Legacy_old_VI_name.vi` when detected in version 7.0 or 7.1.

**Table 1.** Comparison of Historical Data VIs

Version 6.x VI	Version 7.x VI
—	Create Database
—	Detach Database
—	Delete Database (7.1 only)

**Table 1.** Comparison of Historical Data VIs (Continued)

<b>Version 6.x VI</b>	<b>Version 7.x VI</b>
Archive Database	Archive Traces
Call HTV	Call HDV
Compact Database	Compact Database
Decimate Historical Trend	Decimate Trace
Decimate Historical Trends	Decimate Traces
Delete Traces	Delete Traces
Get Historical Tag List	Get Trace List
Get Historical Trend Info	Get Trace Info
Get Trace Names	Get Trace List
Historical Trend Statistics	Get Trace Statistics
Historical Trend to Spreadsheet	Write Traces to Spreadsheet
Historical Trend to Spreadsheet File	Write Traces to Spreadsheet File
Launch MAX HDV	Call HDV
Make Database Network Path	—
Read Historical String Trend	Read Trace (String)
Read Historical String Trends	Read Traces (String)
Read Historical Trend	Read Trace
Read Historical Trend	Read Trace (Bit Array)
Read Historical Trend	Read Trace (Logical)
Read Historical Trend	Read Trace (Numeric)
Read Historical Trends	Read Traces
Read Historical Trends	Read Traces (Bit Array)
Read Historical Trends	Read Traces (Logical)
Read Historical Trends	Read Traces (Numeric)
Rename Traces	Rename Historical Data
Split Network Database Path	—

## Revised Historical Alarm and Event VIs

Version 7.0 of the DSC Module introduced changes to several VIs on the **Alarm & Events** palette:

- The format of returned alarms provides additional data.
- The A&E Query to Spreadsheet VI allows either text or HTML output format, and you can define a header, footer, and delimiter.
- The alarm and event queries support more advanced filtering.
- The Make Network Path VI and Split Network Database Path VI are no longer on a palette because the DSC Module no longer uses database paths.
- The VIs have new icons.

If you have a DSC Module 6.x application that uses the Alarms & Events VIs, you do not need to replace them unless you want to take advantage of the new functionality. HIST Alarm & Event Query and HIST Alarm & Event Query to Spreadsheet File will be renamed automatically to `Legacy_old_VI_name.vi` when detected in version 7.0 or 7.1.

**Table 2.** Comparison of Historical Alarm and Event VIs

Version 6.x VI	Version 7.x VI
Acknowledge Alarm	Acknowledge Alarm
Archive Alarms and Events	Alarm & Event Archive
Get Alarm Summary Status	Get Alarm Summary Status
HIST Alarm & Event Query	Alarm & Event Query
HIST Alarm & Event Query to Spreadsheet File	Alarm & Event Query to Spreadsheet File
Make Network Database Path	—
Read Alarm Summary	Read Alarm Summary
Read Event History	Read Event History
Read Tag Alarm	Read Tag Alarm
Split Network Database Path	—

The legacy HIST Alarm & Event Query to Spreadsheet File VI no longer supports the **timeout**, **table or multicolumn listbox**, and **colors** parameters. If you wire values to any of these parameters, you get a warning that the features are no longer supported, along with any errors from the query. The new Alarm & Event Query to Spreadsheet File VI also does not support the **timeout**, **table or multicolumn listbox**, and **colors** parameters.

## Revised Data Set Logger VIs

Version 7.0 of the DSC Module introduced several changes to the Data Set Logger VIs:

- **database path in** is now **database URL**.
- Doubles are replaced by the LabVIEW time stamp data type.
- A new **timeout** parameter is provided.

If you are updating a DSC Module 6.x application that uses Data Set VIs, you must right-click the VIs on the block diagram and choose to replace them with the legacy version available in `legacy.llb` in the `vi.lib\lvdsd\servers\Data Set Logger` directory. The format of the legacy VIs is `legacy_old_name.vi`. These legacy VIs have the new functionality but use previous inputs and outputs.

If you are developing a new application, use the new Data Set VIs available on the palette.

## Other VI and Palette Changes



Version 7.0 of the DSC Module introduced the following changes:

- DSC Module controls and VIs are accessible through the DSC Module icon, shown at left.
- The Tag control is located on the **DSC Module** controls palette rather than the **I/O** controls palette.
- The **Tags** palette includes a **Tag Name to DataSocket URL** function.
- The Get Logging Status VI on the **System** palette has a **logging databases** parameter.

## New Version of Historical Data Viewer

With the Historical Data Viewer that comes with versions 7.0 and 7.1 of the DSC Module, you can view both Citadel 4.x and Citadel 5 databases in Measurement & Automation Explorer (MAX). You also can convert Citadel 4.x databases to Citadel 5 format. In addition, navigation tools have been added for simpler viewing of data sets.

## Revised Historical/Event Logging Configuration

Citadel 5 databases are identified by names instead of paths. For Citadel databases that have not been converted to Citadel 5 format, the DSC Module creates a name for the database using its path and underscore characters.

You must give each Citadel 5 database a unique name/path pair. For example, you can have a database named `Db1` on multiple computers, but you cannot have two databases named `Db1` on the same computer. Database name/path pairs are checked for conflicts when you configure historical or event logging and when the Tag Engine launches.

When you open a `.scf` file that was created in version 6.x of the DSC Module, you are prompted to convert the file and its associated databases to the current format. For more information about converting databases, refer to the [Converting Citadel 4.x Databases](#) section of this document.

## Enhanced HMI Wizard for Historical Trends

When you right-click a Historical Trend and launch the HMI Wizard in version 7.0 or 7.1 of the DSC Module, you can select tags from either a database or a `.scf` file.

## New Version of Image Navigator

The Image Navigator that comes with versions 7.0 and 7.1 of the DSC Module contains over 4,000 symbols. It includes many new symbols, new categories, improvements to existing graphics, broader support for various file types, and feature enhancements such as drag-and-drop.

## Tag Monitor Enhancements

The Tag Monitor that comes with versions 7.0 and 7.1 of the DSC Module has the following additional features:

- New display columns for **Tag Name** and **Read/Write Attributes**
- New **Type Mismatch Checking**, **XX for Bad Quality**, **Hex for Raw Data**, **Set Decimal Places**, and **Select Columns** selections available in the **Options** menu

## New Examples

Version 7.0 of the DSC Module introduced additional examples to help you develop applications and understand common DSC Module tasks. Select **Help»Find Examples** to access all examples in the NI Example Finder.

## Online Documentation Enhancements

Version 7.0 of the DSC Module introduced a Bookshelf in PDF format so that you can search National Instruments product documents installed on a computer. To access the Bookshelf PDF, select **Help»Search the DSC Module Bookshelf** in LabVIEW. You must have Adobe Reader version 5.0.5 or later with Search and Accessibility to use the search

functionality. Refer to the Adobe Systems Incorporated Web site at [www.adobe.com](http://www.adobe.com) to download Adobe Reader.

The following *LabVIEW Help* updates were introduced in version 7.0 of the DSC Module:

- Use the *LabVIEW Help* to learn about the DSC Module features. You can access the *LabVIEW Help* by selecting **Help»VI, Function, & How-To Help** in LabVIEW.
- When you click an input or output parameter in the help, the help topic jumps to the description of the parameter in the scrolling region.
- Click either the **Place on the block diagram** button or **Find on the Functions Palette** button in a VI reference topic and switch back to LabVIEW to place the VI on the block diagram or view the VI on the palette.

## Change in Bad Quality Status

The error status for application-defined quality is now a warning instead of an error. For example, a thermocouple out-of-range state from FieldPoint is now a warning and not a bad-quality error.

## Changes to NI Services

Version 7.0 of the DSC Module introduced a new version of the Citadel service, which appears as **National Instruments Citadel** in Windows **Services** and `nicitd15.exe` in the Task Manager. To start and stop this or other NI services, use Windows **Services** available in the **Control Panel**.

## Change to Default Source of Time Stamps

By default in versions 7.0 and 7.1 of the DSC Module, time stamps logged to Citadel come from the system clock of the computer running the Tag Engine instead of from the server. To have time stamps come from the server, change the `DSCEngine.ini` setting `Use Server Timestamps` to `TRUE`. Because changing this setting can result in larger Citadel databases, NI recommends keeping the default value.

# Upgrading DSC Module 6.x Applications to 7.1

---

After installing version 7.1 of LabVIEW and the DSC Module, follow the instructions in this section to convert existing DSC Module applications.

## Upgrading from Version 7.0

If you are upgrading an application built or run in version 7.0 of the DSC Module, you do not have to do any manual conversion work. When you open the application in version 7.1, LabVIEW automatically recompiles it.

## Converting Version 6.x .scf Files

When you use the Tag Configuration Editor to open a `.scf` file created in version 6.x of the DSC Module, a conversion wizard launches and leads you through the process of converting the `.scf` file. The wizard also gives you the option of converting existing Citadel 3.8 or 4.x databases that are associated with that `.scf` file. If the Tag Engine attempts to access a `.scf` file that you have not yet converted, an error message appears.

The conversion wizard saves a renamed backup of the original `.scf` file to the same location as the new, converted `.scf` file.

## Converting Citadel 4.x Databases

The DSC Module versions 7.0 and 7.1 log to and retrieve from Citadel 5 databases only. You must convert older databases to Citadel 5 if you want to use them with the current DSC Module.

### Databases Associated with a .scf File

When you open a `.scf` file created in version 6.x of the DSC Module, a conversion wizard launches. After converting the `.scf` file, the wizard gives you the option of converting databases that are associated with that `.scf` file.



**Caution** NI recommends using the default conversion options. If you must save the converted database to a location other than the default path due to a shortage of hard drive space, for example, you might need to make minor changes to the application.

To log new data to an existing database, do not log data until you convert the database to Citadel 5. If you log data from a converted application before converting the database, the DSC Module creates a new, empty Citadel 5 database in the same location as the older Citadel database and

logs data to that new database. To get all the logged data back into one database after that happens, you must use the Historical Data Viewer to convert the older Citadel database and then merge it with the new Citadel 5 database.

## Databases Not Associated with a .scf File

If you choose not to convert a Citadel database when the wizard asks you, or if you have an existing database that is not associated with a converted .scf file, you can convert the database using the Historical Data Viewer in MAX. In LabVIEW, select **Tools»DSC Module»View Historical Data**. In the window that opens, right-click the **Historical Data** category, select **Create New** from the shortcut menu, and choose the appropriate conversion in the dialog box that appears. If you cannot locate the database you want to convert, you might need to create a Citadel 4.x version of it in Historical Data Viewer before choosing to convert it to Citadel 5.

## Remote Databases

You cannot convert a database remotely. You must convert it on the computer where it exists.

## Converted Alarms

Alarm priorities logged by version 6.x of the DSC Module ranged from 0–10, and those values are retained when converted to Citadel 5 format. Alarm priorities logged to Citadel 5 range from 0–15.

## Redirecting NI HyperTrend and HTV to Citadel 5 Data

If you convert a Citadel database and an application that uses the NI HyperTrend control, right-click the control on the front panel and select the tags to display so that data is retrieved from the converted Citadel 5 database instead of the old Citadel database.

If you convert a Citadel database and an application that uses Historical Trend Viewer (HTV), launch HTV and select the tags to display so that data is retrieved from the converted Citadel 5 database instead of the old Citadel database.

## Checking for Nondefault Citadel 4.x Conversion Issues

If you do not use the default values while converting a Citadel database, or if you rename a database after conversion, verify that any VI parameters such as **Citadel path in**, **source Citadel path**, **database path**, **data directory**, **network path**, and so on, point to the new database location or name.

If you rename or move a `.scf` file after conversion and the application includes the Call HTV VI, verify that the **scf path** parameter of that VI points to the correct file location.

## Creating a New ODBC Data Source

For information about creating an ODBC data source for Citadel 5, refer to the [Citadel 5 ODBC Data Source](#) section of this document.

## Updating Citadel 4.x SQL Queries

If you have existing SQL queries for retrieving Citadel 4.x data, you must convert them for use with Citadel 5. Refer to Tables 3 and 4, which detail the differences in Citadel 4.x and Citadel 5 queries.

**Table 3.** Changes in Citadel Tables

Citadel 5 ODBC Driver	Citadel 4.x ODBC Driver	Description
Aliases	N/A	Aliases table is used to map alias names to actual tag names.
RawData	Points	RawData table is used to retrieve the actual values logged for a tag and times they were logged. You can query only one tag at a time.
IntData	Traces	IntData table is used to retrieve interpolated values. You can query more than one tag at a time.
DS_RawData_dataset_name	N/A	DS_RawData_dataset_name table is used to retrieve the actual values logged for a tag, times, and particular data set where logged. You can query only one tag at a time.
DS_IntData_dataset_name	N/A	DS_IntData_dataset_name table is used to retrieve the interpolated values for a particular data set. You can query more than one tag at a time.

For more information about each Citadel 5 database table, refer to Appendix A, *Using SQL to Access Historical Data in a Citadel Database*, of the *LabVIEW Datalogging and Supervisory Control Module Developer Manual*.

## Citadel 5 Transform Functions

Transform functions have changed with Citadel 5, as shown in Table 4.

**Table 4.** Changes in Transform Functions

Citadel 5 ODBC Driver	Citadel 4.x ODBC Driver	Description
MATH_MIN( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	MIN( <i>tag</i> )	Returns the minimum for <i>tag</i> across the interval.
MATH_MAX( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	MAX( <i>tag</i> )	Returns the maximum for <i>tag</i> across the interval.
MATH_AVG( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	AVG( <i>tag</i> )	Returns the average for <i>tag</i> across the interval.
MATH_STDEV( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	STDEV( <i>tag</i> )	Returns the standard deviation for <i>tag</i> across the interval.
MATH_STARTS( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	STARTS( <i>tag</i> )	Returns the number of starts (that is, the number of transitions from OFF to ON) for <i>tag</i> across the interval. For numeric points, 0.0 is interpreted as OFF, and all other numbers are treated as ON.
MATH_STOPS( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	STOPS( <i>tag</i> )	Returns the number of stops (that is, the number of transitions from ON to OFF) for <i>tag</i> across the interval.
MATH_ETM( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	ETM( <i>tag</i> )	Returns the amount of time <i>tag</i> was in the ON state across the interval.
MATH_QUAL( <i>tag</i>   TO_DISCRETE( <i>tag</i> )   TO_CONTINUOUS( <i>tag</i> ))	QUAL( <i>tag</i> )	There might be gaps in the historical data traces in Citadel because of a computer shutdown, Tag Engine shutdown, or similar occurrence. MATH_QUAL returns the ratio of time for which valid data exist for <i>tag</i> across the interval to the length of the interval itself. If valid data exist for only one-half of the interval, MATH_QUAL returns 0.5.

**Table 4.** Changes in Transform Functions (Continued)

Citadel 5 ODBC Driver	Citadel 4.x ODBC Driver	Description
TO_DISCRETE( <i>tag</i> )	N/A	Casts current <i>tag</i> type to discrete (that is, the <i>tag</i> is treated as discrete).
TO_CONTINUOUS( <i>tag</i> )	N/A	Casts current <i>tag</i> type to continuous (that is, the <i>tag</i> is treated as continuous).

Standard set functions (MIN, MAX, AVG, COUNT) are supported and you can use them on any Citadel 5 table. It is important to distinguish between set functions MIN, MAX, and AVG, and Citadel 5 transform functions MATH\_MIN, MATH\_MAX, and MATH\_AVG. Set functions perform calculations on query results. Transform functions perform calculations on interpolation intervals.

Tag names are forced into an accepted format by replacing characters within the names with the characters in Table 5.

**Table 5.** Special Access SQL Characters

Special Character	Converted Character
period ( . )	at sign (@)
forward slash (/)	backslash (\)

## Long Tag Names and Aliases

Database tables and column names can be only up to 126 characters long and cannot contain some special characters. Some ODBC clients support names only up to 62 characters long. The database URL is not included in a tag or data set name. The Citadel 5 driver automatically generates alias names for tags or data sets whose names are longer than the **Maximum Column Name Length** value specified in the ODBC configuration dialog box. Alias names consist of a prefix and original tag or data set name substring, so the total length of the alias string is equal to the **Maximum Column Name Length** value. An alias prefix has the format ~XXXXXXXXXXXXXXXXXX\_ where XXXXXXXXXXXXXXXXXXXX is a 64-bit tag or data set ID.

## Reimporting FieldPoint Configuration

If you communicate with FieldPoint modules in a DSC Module application using the FieldPoint IAK server, sometimes referred to as the FieldPoint LabVIEW DSC Server or the FieldPoint VI-Based Server, complete the following steps after upgrading from version 6.x of the DSC Module.

1. Uninstall FieldPoint Explorer if you are using a version earlier than 3.0.1.
2. Download and install a more recent version of FieldPoint Explorer.
  - If you install FieldPoint version 3.0.1 or 3.0.2, mass compile the FieldPoint IAK server (the contents of the <LABVIEW>\\_servers\FieldPoint folder), and export the configuration to the DSC Module by selecting **BridgeVIEW»Export to BridgeVIEW** from FieldPoint Explorer.
  - If you install FieldPoint version 4.0, save a backup of the .scf file and then revise it to use the FieldPoint OPC Server in one of two ways:
    - Use the Tag Configuration Wizard to generate a new set of tags using the **National Instruments.OPCFieldPoint** server.
    - Edit the configuration of each FieldPoint tag. On the **Connection** tab, change the **Server Name** to **National Instruments.OPCFieldPoint**. Add the tag to an **I/O Group**, and select the appropriate **Item**.

## Special Upgrade Notes for BridgeVIEW Users

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The following special topics apply when upgrading directly from BridgeVIEW to version 7.1 of the DSC Module.

### Major Interface Changes

Whereas BridgeVIEW was a stand-alone software package, the DSC Module is an add-on to LabVIEW. The items on the BridgeVIEW **Project** menu now appear in the LabVIEW **Tools»DSC Module** menu. DSC Module tools are concentrated in this menu. The controls, indicators, VIs, and functions that come with the DSC Module are added to the LabVIEW **Controls** and **Functions** palettes. The Tag Engine, the next generation of the BridgeVIEW engine, is how the DSC Module manages data.

### IAK/IAS Servers

NI recommends that instead of the old IAK (IAS) servers, you use the National Instruments Lookout Protocol Drivers OPC Server or the OPC servers for NI-DAQ, National Instruments FieldPoint, and National

Instruments Foundation Fieldbus. For more information about converting an application so that it does not use IAK (IAS) servers, refer to the NI Developer Zone at [ni.com/zone](http://ni.com/zone).

## Importing Tags

Open the Tag Configuration Editor and select **File»Import Network Tags**. In the dialog box that appears, you can browse to a `.scf` file on any computer on a network and import tags from that file into a local `.scf` file.

You also can use this dialog box to import tags from a remote computer using BridgeVIEW 2.x networking. This option is provided for compatibility with BridgeVIEW 2.x networking, but NI recommends converting to the latest National Instruments Logos networking when possible. To use Logos networking, either create new tags or update the connection information for each existing tag.

You also can access this option in the Tag Configuration Editor with BridgeVIEW compatibility preselected by selecting **Configure»Network»BridgeVIEW 2.x Networking»Import Network Configuration**.

If you have enabled BridgeVIEW 2.x networking in the Tag Configuration Editor, the **Advanced** button on the **Configure Network Access** dialog box is enabled. Click this button in the dialog box to launch a **Network Settings** dialog box. These settings apply only to BridgeVIEW 2.x networking.

## Converting Network Protocol

In the Tag Configuration Editor, select **Configure»Network»Convert Network Protocol** to convert the currently loaded `.scf` file from BridgeVIEW 2.x network tags to DSC Module Logos tags.

The DSC Module makes use of the Logos communications protocol, an internal National Instruments technology for rapid and reliable transmission of data across a network and between applications running on one computer. You might occasionally see the term Logos in data addressing and browsing activities, and you might find the term used in URLs for data connections.

## Adjusting Security Levels

BridgeVIEW offered up to 255 security levels. The DSC Module offers 11 levels, ranging from 0 to 10. The DSC Module does not depend on security levels, however, and discourages their use. Instead, NI recommends that you use access rights to configure access to controls and indicators.

## Importing Security User Accounts

You can import BridgeVIEW user accounts into the User Account Manager. If it is not already running, open the National Instruments User Account Manager by selecting **Tools»DSC Module»Security»Edit User Accounts**. Select **User»Import BridgeVIEW User Accounts**. A dialog box appears, asking you whether the user accounts you want to import are from BridgeVIEW 1.0, 1.1 or later, a BridgeVIEW 2.0 binary export, or a BridgeVIEW text export file. Select the correct option to complete importing the user information.

When the DSC Module User Account Manager imports user accounts from BridgeVIEW, it maps the security levels as shown in Table 6 and Table 7.

**Table 6.** BridgeVIEW Default Security Level Conversions

<b>BridgeVIEW Default Security Level</b>	<b>User Account Manager Security Level</b>
0	0
25	1
50	2
100	4
150	6
200	8
255	10

**Table 7.** BridgeVIEW Security Range Conversions

<b>BridgeVIEW Security Level Range</b>	<b>User Account Manager Security Level</b>
0	0
1–38	1
39–63	2
64–89	3
90–114	4
115–140	5
141–165	6
166–191	7

**Table 7.** BridgeVIEW Security Range Conversions (Continued)

<b>BridgeVIEW Security Level Range</b>	<b>User Account Manager Security Level</b>
192–216	8
217–242	9
243–255	10

## Known Issues

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For recent known issues not included in these release notes, refer to the `dsc_readme.html` file in the LabVIEW directory. Version 7.1 of the DSC Module has the following known issues.

## Installation

- If you install the DSC Module on a non-English version of Windows, the following error message appears:

**(Error 1931. The windows installer service cannot update the system file <system path>\mscpxl32.dll...)**

This error appears because the DSC Module installs Microsoft Data Access Components (MDAC) version 2.7, but installing on a non-English version of Windows requires MDAC 2.7 service pack 1, available at the following location:

<http://www.microsoft.com/downloads/details.aspx?FamilyID=9ad00f2-cae7-493d-b0f3-ae36c570ade8&DisplayLang=en>

- Due to a change in Citadel, you must install a patch for version 7.0 of the DSC Module if you want to run both version 7.0 and 7.1 on the same computer. The patch for version 7.0 is located on the installation CD in the Simultaneous Operation Patch folder.
- `cwui.ocx` cannot be registered on a Windows XP computer that has Crystal Reports 8 installed. Complete the following steps to work around the problem by granting the user full access to the `cwui.ocx` type library registry key and its subkeys.
  1. Open the registry editor and select the `cwui.ocx` key, `HKEY_LOCAL_MACHINE\SOFTWARE\Classes\TypeLib\{D940E4E4-6079-11CE-88CB-0020AF6845F6}`.
  2. Select **Edit»Permissions** and select the appropriate user.
  3. Click the **Advanced** button, click the **Edit** button, grant full control, and click the **OK** button.

4. Enable the **Replace permission entries on all child object switch entries shown here that apply to child objects** option and click the **OK** button.
5. From a command prompt, run `regsvr32 cwui.ocx` to manually register `cwui.ocx`.

## Data Logging and Retrieval

- When querying a large local database with many (hundreds of thousands) of data set runs in it, the Data Set Logger VIs might appear to hang before timing out. This delay is not an issue with remote queries. If necessary, use a timeout of `-1` to prevent the apparent hang. Though this work-around solution allows other activity to continue, you still have to wait for the data query.
- NI cannot guarantee that all data is preserved after a computer crashes or the power fails. NI recommends that you use NTFS (NT File System) and uninterruptible power supplies for computers that are acquiring or logging data.
- If you quit the Tag Engine using the Task Manager, the Citadel database can be corrupted.
- Database names cannot contain certain characters. They must contain only characters `A-Z`, `a-z`, `0-9`, and the underscore character (`_`).
- Periodically, you might see CPU usage at 100% due to Citadel and SQL services, even when no clients are present.
- Converting a large (2 GB or more) Citadel 4.x database to Citadel 5 is slow.
- In Historical Data Viewer, A&E Views might not work after a destructive database archive.
- When changing an NI HyperTrend y-axis **Minimum** and **Maximum**, the **Apply** button does not work. Click the **OK** button to apply the change. When changing an NI HyperTrend x-axis **Width**, you must right-click the NI HyperTrend and select **Restore X Axis Width** from the shortcut menu to apply the change.
- If a remote database connection is lost while a client computer is in hibernation mode, an NI HyperTrend display on the client computer might hang.
- If you try to configure data sets when the Tag Engine is running, you can select tags only from the `.scf` file being used by the Tag Engine.
- If the network connection is lost during an archive operation to a remote computer, the operation times out and aborts instead of waiting for reestablished communication.

# OPC

- The DSC Module OPC server does not support non-Western character sets.
- You might experience a hang or error when attempting to launch NI-DAQ or the DAQ OPC server from a DSC Module application. A work-around solution is described in the NI KnowledgeBase on [ni.com](http://ni.com), *Unusual Error Messages Loading, Executing, or Debugging an Application When Using NI-DAQ for Windows*.
- In Server Explorer or Server Browser, browsing to remote OPC servers might not work for certain operating systems.
- Even when an OPC server has items off scan, the Tag Engine can connect to the items and the `.scf` file sets initial values for the items.
- The OPC Demo server might not correctly unload when the Tag Engine stops. Exit LabVIEW to unload the server.
- In Server Explorer, you might receive error 0x80080005 when trying to launch the OPC LabVIEW server.
- The Tag Engine might not shut down as expected after OPC clients are disconnected. If you lose a connection to the OPC Server and you try to shut down the Tag Engine on the client computer, the Tag Engine might appear to hang. However, the Tag Engine is not hanging in this case. It is waiting for the timeout period, which is about three minutes.

## DSC Module VIs, Communication, and Dialog Boxes

- You cannot use the HMI Wizard with the digital waveform graph in LabVIEW.
- If data is being written to the Tag Engine while an application is reading a trend with a large number of samples (100,000 or more) in a tight loop, the read might fail.
- When you attempt to start or stop the Tag Engine from the Engine Manager window, certain error messages might be placed under the Engine Manager window where you cannot see them.
- With **extrapolate to now** set to TRUE and **interpolate through gaps** set to FALSE, the legacy Read Historical Trend(s) VIs extrapolate the last good value to now, even if the tag status has gone bad.
- A **Can't connect to Lookout** error occurs if you use the HMI Wizard to create a front panel DataSocket item and the VI is set to run when opened. To avoid this error, first open LabVIEW and then open and run the VI.
- The DSC Module might not correctly report bad status for disconnected or unavailable FP-1600 modules.

- Tag control values might reset to 0 instead of the LabVIEW default value, last value held, or last value logged.
- The Tag Status Handler VI does not support positive user-defined error codes. If a user-defined error code has a positive value, the default LabVIEW error message is used.
- The polymorphic Read Trace VI might not automatically change type when you wire in a certain data type. To select the correct type, right-click the VI on the block diagram and choose **Select Type** from the shortcut menu.

## Tag Monitor

In Tag Monitor, denying read privileges causes a quality of access denied for write-only tags. The read/write column values also might not be accurate.

## Examples

The Trend-Flow VI of the Heat Exchanger example includes a hard-coded database URL on the block diagram. If you install the DSC Module to any location other than the default location, clicking the **Flow (Water & Air)** button on the front panel fails to populate the report screen with data. To fix this problem, correct the **database URL** in `Trend-Flow.vi`, located in `Heat Exchanger.llb`.

## More Information and Updates

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For information on DSC Module updates and changes in the future, visit [ni.com/labviewdsc](http://ni.com/labviewdsc).

To download the newest NI patches and other updates, visit [ni.com/downloads](http://ni.com/downloads).