



ULTRATREND DMS 6

Database Management System

User Manual



Version 6.9.4
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I. Software Installation & Overview

1. Introduction

Ultratrend DMS is a data organizing software for creating and maintaining databases that apply to all the basic applications performed by the digital Ultraprobe models and 4Cast monitoring system. Users can select Generic, Bearings, Leaks, Valves, Steam and Electrical applications for inspection. It will store and organize records, provide reports, alarms, and charts.

Users will be able to transmit data from Ultraprobe to a computer via USB, SD card, or Wi-Fi.

The Ultratrend DMS software package supports internet communication with the 4Cast monitoring system. 4Cast is a unique system that continuously logs bearing data and bearing sounds. At pre-set intervals, all stored data and sound samples are sent to a computer for reporting and analysis.

2. Program Overview

To allow for customization and ease of use, the DMS 6 software is divided into three modules that can be installed separately or together based upon the end user's configuration needs. These modules are the DMS Interface, DMS Database, and the UE 4Cast Controller.

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DMS Interface

The DMS Interface is similar in appearance and operation to Windows Explorer providing users with a “Record Hierarchy” view of the data and the ability to sort, organize and archive records. The record hierarchy is ***Plant, Application, Group, Location/Machine and Point***. Each Record will maintain fields, which hold basic inspection data as well as a subsection for historical information. The hierarchy design of the program provides users with the capability of ever-expanding data management.

The DMS Interface includes the 4Cast Manager, which is the configuration tool for interacting with 4Cast devices.

DMS Database

The DMS Database is the storage location for all data that the system stores. A single database installation can have multiple interfaces and can support data acquisition from the 4Cast system even when the interface is not open.

UE 4Cast Controller

The UE 4Cast Controller is a module that allows for communication with the 4Cast and Ultraprobe 15,000B.

3. System Requirements

- Windows 10 or 11
- Windows Server 2016 or greater
- Microsoft SQL Server 2016 or greater; Express 2017 is provided
- 5 GB of hard drive space minimum to install; 30 GB recommended for data storage
- 8 GB of RAM required; 16 GB of RAM recommended
- Intel i5 or Ryzen 5 processor or greater
- Microsoft Office 365

4. Installing the Software

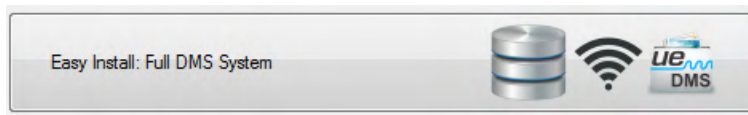
The DMS 6 software can be downloaded from the UE Systems website:

<https://www.uesystems.com/product/dms/>

To begin the installation, run the DMS Installer and select one of the following installation options.

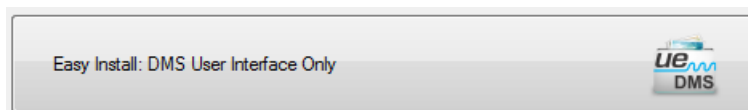
Easy Install: Full DMS System

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The Full DMS System option is intended for a simple installation of the entire Ultratrend DMS software package on one computer.

Easy Install: DMS User Interface Only



The DMS User Interface Only option is intended for a simple installation of the DMS Interface on a client computer that will be accessing a previously installed database on another computer or server in their network.

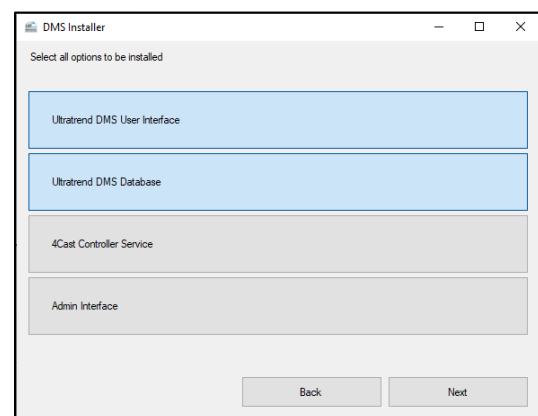
Custom Installation



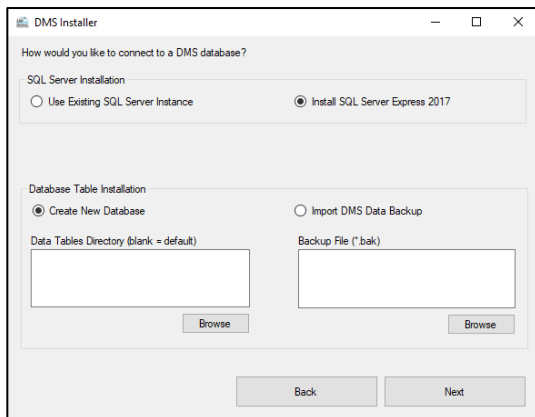
The Custom Installation option allows the user to choose what components of the DMS software to install. It also provides the option to install the DMS 6 database with a backup file, giving the new database access to previous data. Some users may choose an advanced configuration for the DMS installation using the existing SQL database instead of the SQL 2017 Express version included in the DMS software. If that is the case, the Custom Installation process can be used for those configurations.

When the Custom Installation option is chosen, the user will then be given the option to select which components they would like to install.

Each component that is selected will be highlighted “blue” and pressing the Next button will advance the installation process to the Database Instance Installation screen if the “Ultratrend DMS Database” module was selected.



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From the Database Instance Installation screen of the DMS Custom Installer, the user can choose how the database table and instance will be installed.

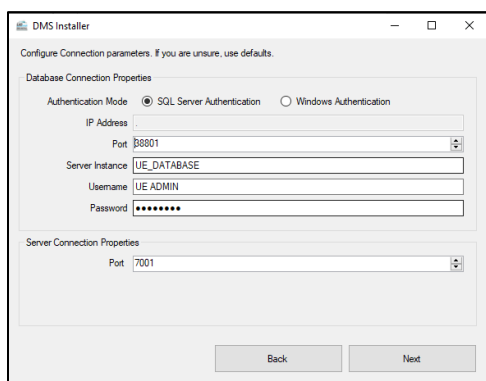
Database Instance Installation – The user can choose one of the following two options: “Use Existing Database Instance” or “Install SQL Server Express 2017”. If “Use Existing Database Instance” is chosen, they will need to use the Browse button to enter the location information for the database into the SQL Base Directory field provided. If “Install SQL Server Express 2017” is selected, the SQL Base Directory field should be left blank.

Database Table Installation – The user can choose one of the following two options: “Create New Database” or “Import DMS Data Backup”. If “Create New Database” is selected, the user has chosen to create a blank database. If “Import DMS Data Backup” is chosen, they will need to use the Browse button to enter the location of the backup file in the field provided.

After the user has made their selections, they can continue with the installation process by pressing Next at the bottom of the DMS Installer screen.

5. Configuring the System

During Installation



When setting up the database during software installation, the user will be prompted with the screen. If creating a new database and not using an existing SQL Server Instance, then the default information can be used.

The Database Connection Properties are as follows:

Authentication Mode – This refers to the way the server/DMS Interface will connect to the database.

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SQL Server Authentication – The account resides in the SQL server master database but nowhere on the Domain.

Windows Authentication – The account resides in the Active Directory for the Domain.

IP Address – The IP address of the computer that is running the database or Host Computer. If the database is on the same network as the server/DMS Interface being installed, the database computer's local IP address or computer name would be used. If it is not on the same network, the external static IP would be used.

To determine the IP Address of the Host Computer that is running the database, perform the following steps on that computer:

- a) Enter CMD in the search bar and select Command Prompt
- b) In the Command Prompt, type IPCONFIG and press enter
- c) Under IPCONFIG, look for the IPv4 address, this is the Host Computer IP Address that will be entered into the Remote Computer connecting to it

Port – The port that SQL Server is configured to connect through on the database computer.

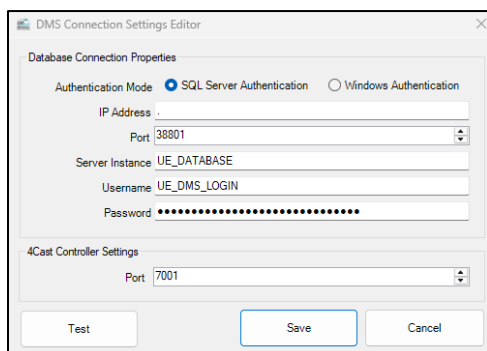
Username – The username configured on the database computer for accessing the database when using SQL Authentication. The default username is UE_DMS_LOGIN

Password - The username configured on the database computer for accessing the database when using SQL Authentication. The default password is Srr3Av5#a4ZTx7#s&eNU2L7kMTMnff

The Server Connection Properties are as follows:

Port – The port that the 4Cast Controller is listening for connection on. To properly connect, make sure this matches what is configured on the 4Cast boxes as well.

Using the Connection Editor



After installing the software, future database and server connection configuration changes can be made with the Ultratrend DMS Connection Editor. It can be found in the computer's start menu programs in the UE System folder. It can also be found at the bottom of the Open Plant screen.

6. Basic Installation Configurations

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Local Computer – Single Point Access

To install the DMS 6 software for use as a single point access on a local computer, please perform the following steps:

- 1) Right-click the DMS Installer Application and select “Run as Administrator”.
- 2) Select the Easy Install: Full DMS System option from the installation screen, when prompted select Next.
- 3) Configure the Database Connection Properties and if unsure use defaults, when prompted select Next.
- 4) Once installation is complete, restart the computer.

Multiple Local Computers – On Same Network

Local Server/Host Computer

- 1) Determine IP Address or Computer name of Host Computer:
 - a) Enter CMD in the search bar and select Command Prompt.
 - b) In the Command Prompt, type IPCONFIG and press enter.
 - c) Under IPCONFIG, look for the IPv4 address; this is the Host Computer IP Address that will be entered into the Remote Computer connecting to it.
- 2) Right-click the DMS Installer Application and select “Run as Administrator”.
- 3) Select the Easy Install: Full DMS System option from the installation screen, when prompted select Next.
- 4) Configure the Database Connection Properties and if unsure use defaults, when prompted select Next.
- 5) Once installation is complete, restart the computer.

Local Client Computer

- 1) Right-click the DMS Installer Application and select “Run as Administrator.”
- 2) Select the Easy Install: DMS User Interface Only option from the installation screen, when prompted select Next.
- 3) For the Database Connection Properties enter the IP Address or Computer name of the Server/Host Computer and if unsure all other options should be left at their default, when prompted select Next.
- 4) Once installation is complete, restart the computer.

7. Advanced Installation Configurations

Use Cases

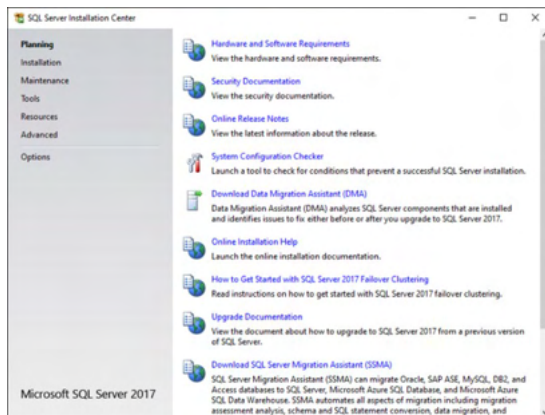
- To use a different version of SQL Server than the default SQL Server 2022 Express.
- The user is not concerned with where the database files live in the file system.

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Additional Requirements

- 1) SQL Server 2017 or greater
- 2) Windows Server 2016 or greater
- 3) A database instance with FILESTREAM enabled

Manual SQL Server Installation

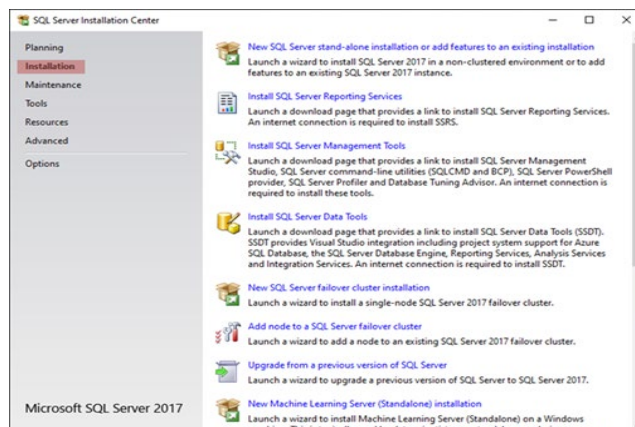


Install SQL Server

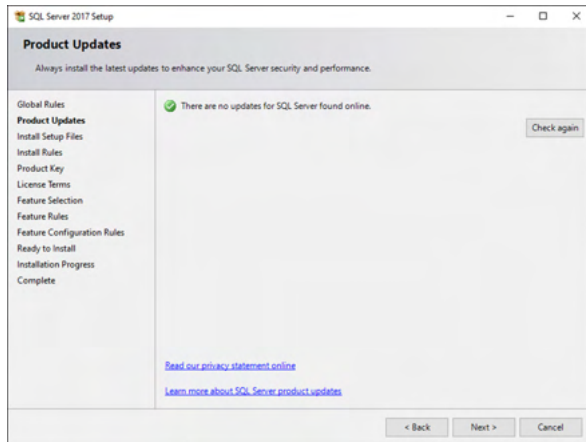
Run setup.exe

- Go to the Installation section.

- Click first option “New SQL Server stand-alone installation or add features to an existing Installation.”



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- After a few moments, a new window will open:

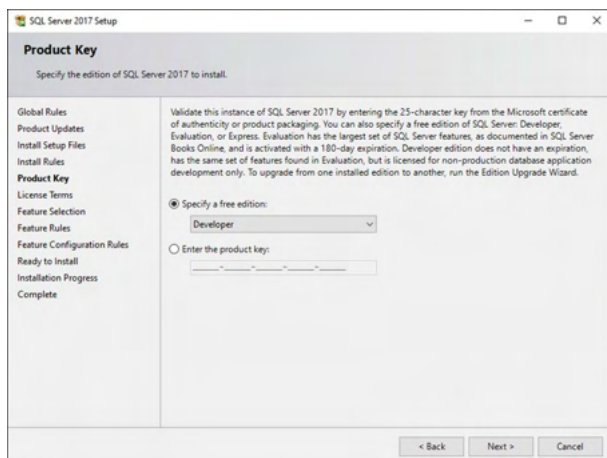
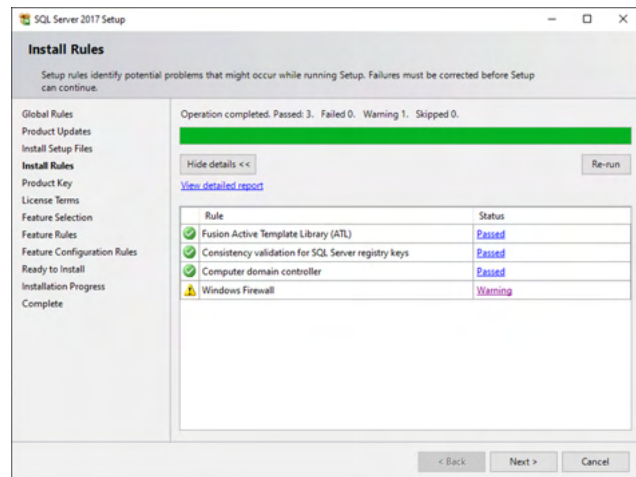
- Click Next

The installer will automatically progress through Install Setup Files and into Install Rules.

- Click Next.

Note:

You will have one warning for Windows Firewall. This is a warning to make sure that you open firewall ports, as necessary. This can be done later.

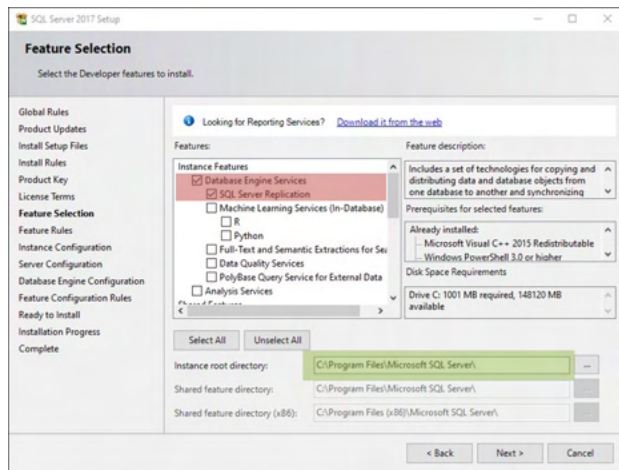
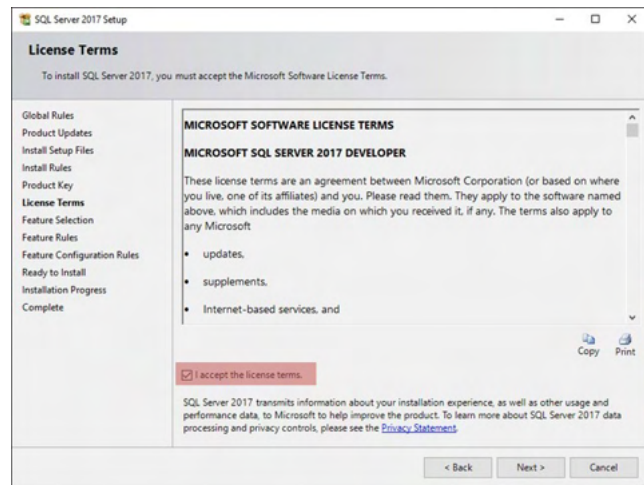


- Free customers can use the Express option, while paid customers should enter their product key.

- Click Next.

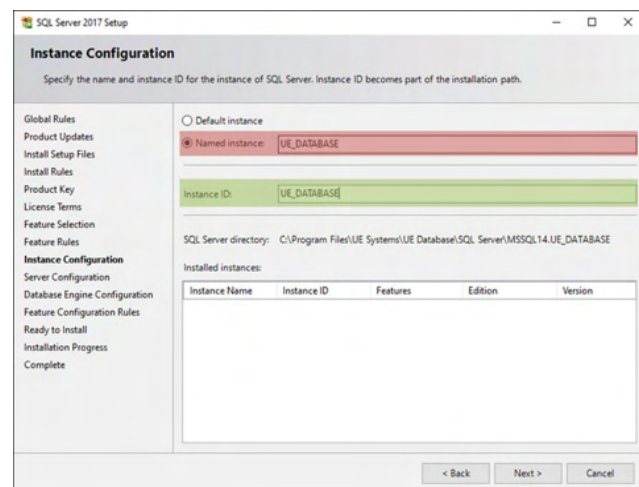
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- Check the box to accept the license agreement
- Click Next

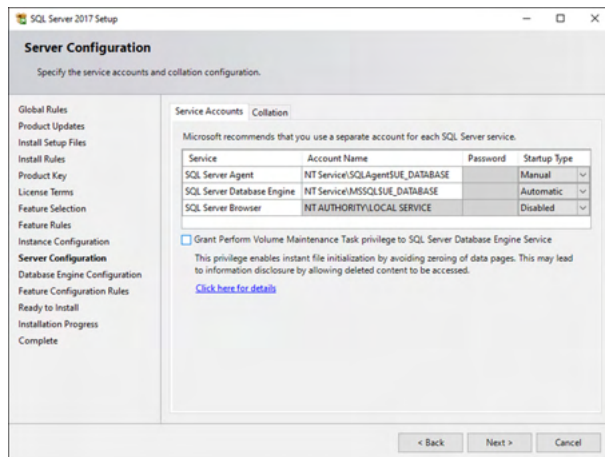


- Select Database Engine Services and SQL Server Replication (red). All other items can remain unchecked, but you may install them if you choose. For the Instance Root Directory (green), we set this value to “C:\Program Files\UE Systems\UE Database\SQL Server\” in our installer, but any directory is valid.
- Press Next to continue. If only the above options were selected, then the installer will skip through Feature Rules into Instance Configuration.

- The installer sets the instance name/id to “UE_DATABASE” but, may use any instance name that is not already listed under Installed Instances.
- Setting the Name will, by default, set the Instance ID to the same value.
- Press Next



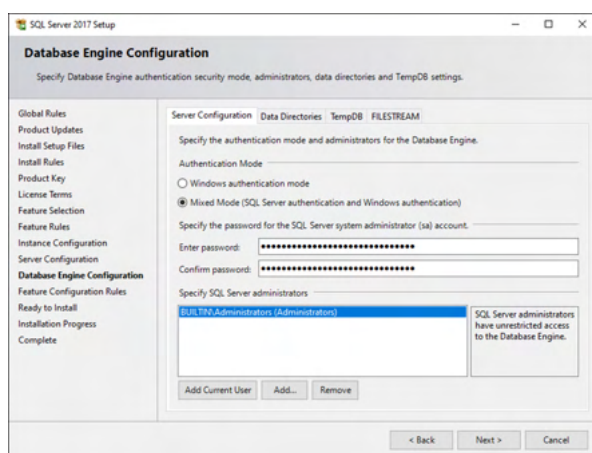
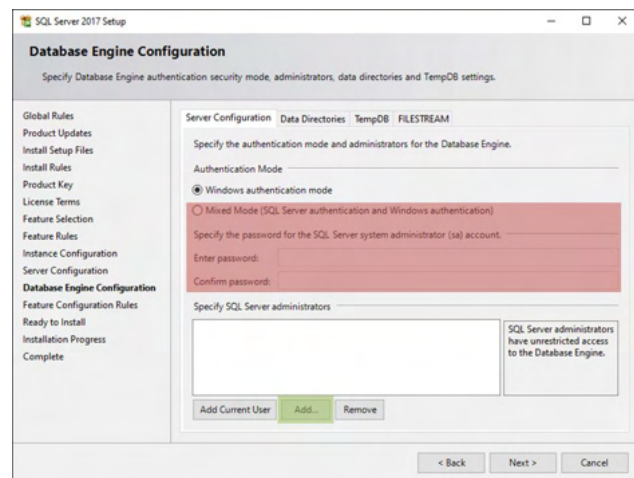
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- The installer will prefill the account names with default values.
These can be left untouched.

- Click Next

- Select the type of authentication mode (Windows or Mixed). Most users will typically use the latter option.



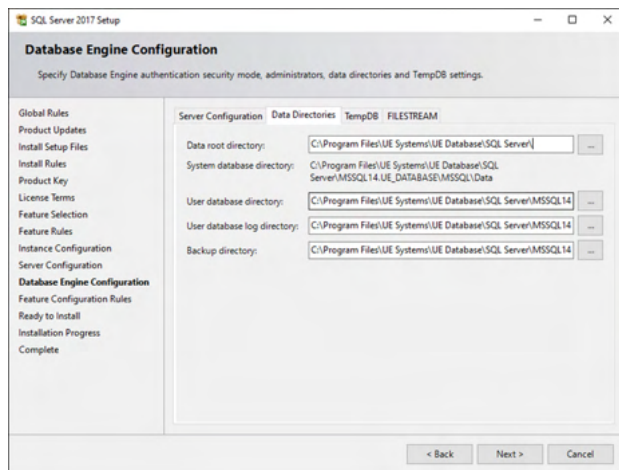
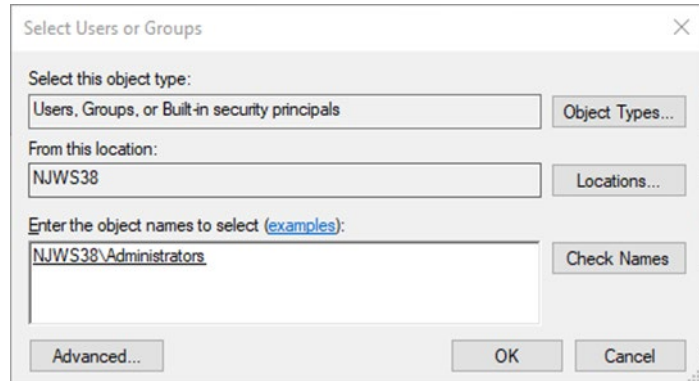
- If Mixed is selected, a default password should be set for the “sa” account (red). This is the super-administrator account that is given unlimited permissions to the database, so this password should be secure.

- We also typically add the BUILTIN\Administrators group to the list of administrators.

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- To add additional admins, select the Add... button (green) and enter the user/group name. For example, to add all admins, enter “Administrators” in the “Enter the object names to select” box
- Press Check Names.
The text will be replaced with “ComputerName”\Administrators.

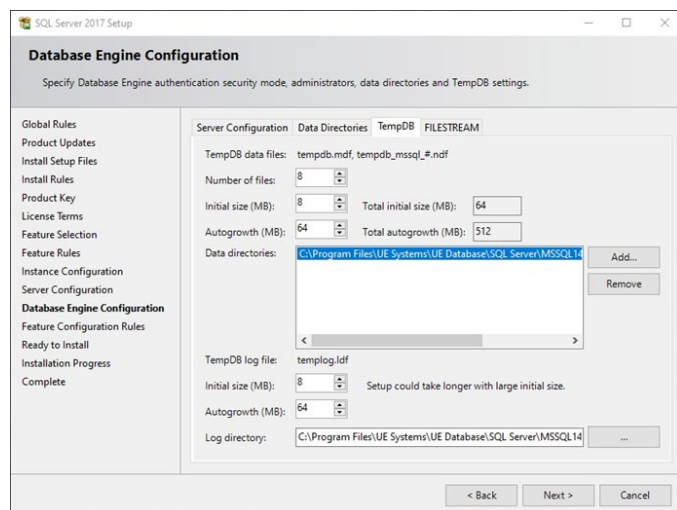
- Press OK to add the user to the list. If you do not want all admins to have access, then selectively choose users to add. Non-Windows users can be added later.



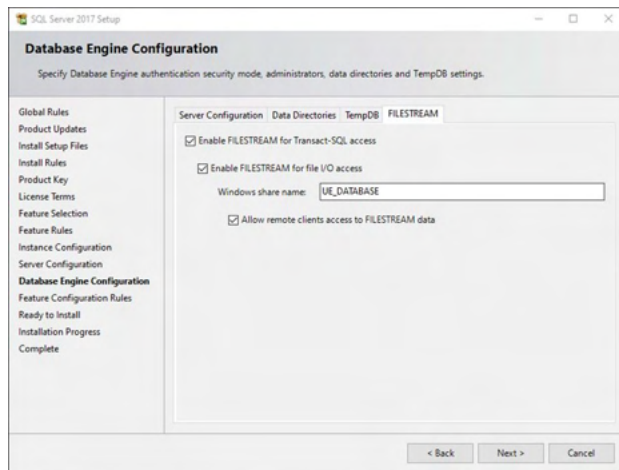
- In Data Directories tab, leave everything automatically filled.

- Click Next

- In TempDB tab, leave things as default as well.



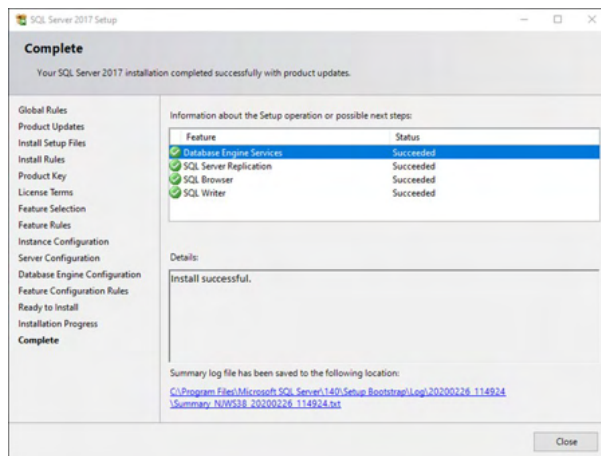
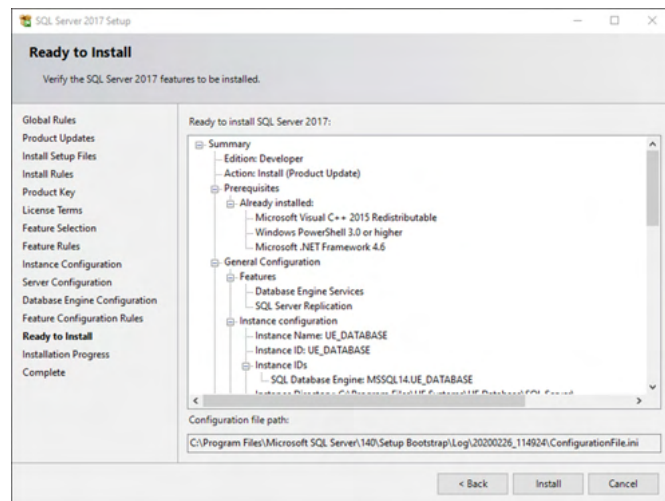
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- Within the FILESTREAM tab, check all the boxes to enable FILESTREAM access and keep the share name the same as the instance name (which will be defaulted).
- Press Next

- This page will summarize all items you are about to install and show you the path to a configuration file that includes all the configuration the installer will use.

- Press Install to start the installation. It may take a few minutes to complete. At the end, the user should get the following success screen:



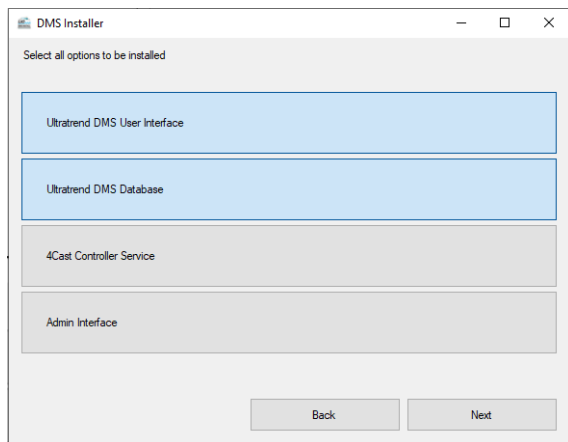
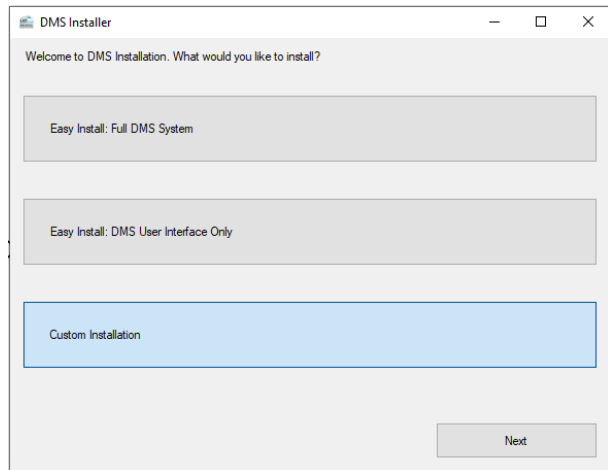
- SQL Server is installed, but it does not know what the database is.
- Click Close
- Run the DMS installer with a custom configuration to finish installation.

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DMS Custom Install

- Open the DMS Installer, select Custom Installation.

- Press Next

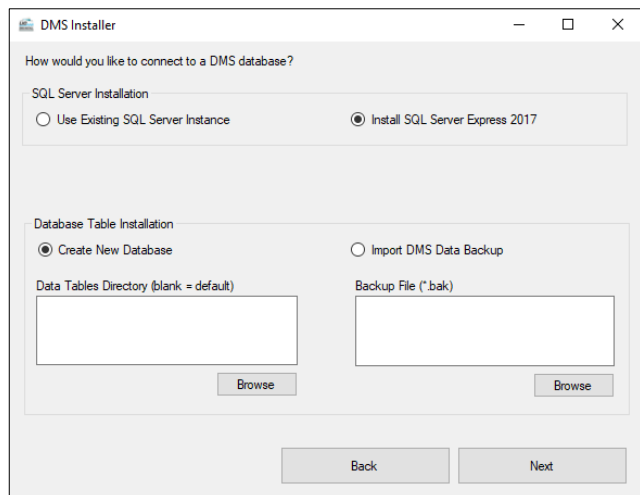


- Select what features to install, but at a minimum, select “Ultratrend DMS Database”

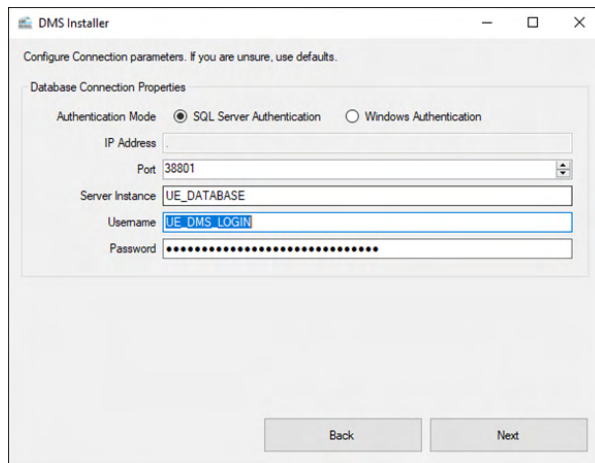
- Press Next

- Select “Use Existing Database Instance” for Database Instance Installation and leave Database Table Installation set to “Create New Database.”

- Click Next



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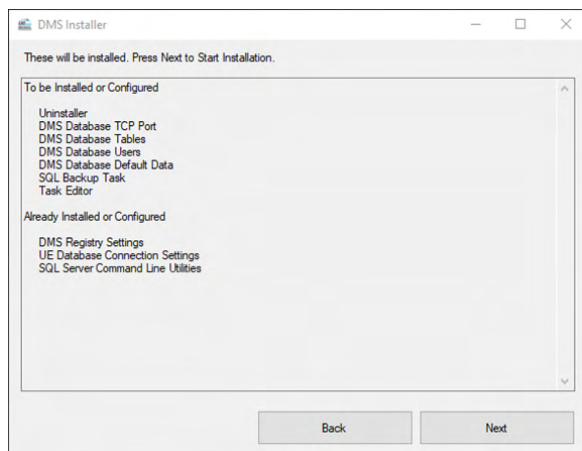
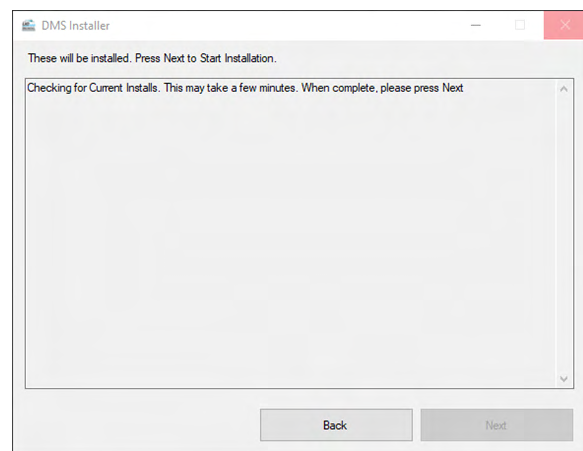


- Set the Server Instance to the same value used when installing SQL Server. Then configure the username and password of the UE_DMS_LOGIN user. Default values are used here, but you can change them. However, if you do change them, make sure the same credentials are used on other installations.

- Alternatively, if you would like to use Windows Authentication, switch to that authentication mode, and ignore the username and password fields.

- Press Next

- The installer will check for existing installations of the DMS software. This may take a few minutes.



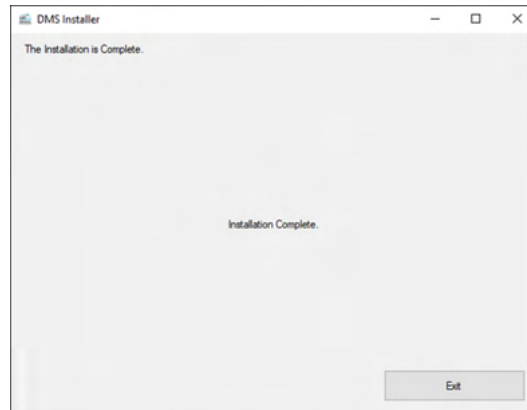
- The installer will display the items to be installed and those that are already installed.

- Press Next to proceed with installation.

- This will take several minutes and proceed to the Installation is Complete screen:

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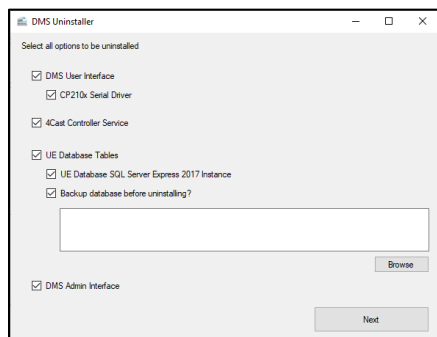
- Press Exit to complete setup.



8. Uninstalling the Software

The DMS Uninstaller can assist with the removal of the different modules and components of the DMS 6 software by selecting Ultratrend DMS 6 (Full) from the computer's Add and Remove Programs list.

Using the DMS Uninstaller



When Ultratrend DMS 6 (Full) is selected to be uninstalled from the computer's Add and Remove Programs list, the DMS Uninstaller application will open. From here, select which portions of the DMS 6 software to uninstall. The option to save a backup file can also be selected from the DMS Uninstaller screen. The backup file can be used during a new installation to provide access to the old data.

The uninstall process will begin when the user presses the button labeled Next. If the checkbox for "Backup database before uninstalling?" is left blank, then the user will receive two warnings confirming they understand that their database will be deleted if they continue. After all portions of the DMS 6 software have been uninstalled, the user will need to restart their computer to complete the process.

Creating a Backup File

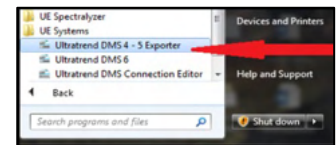
If the user needs to uninstall the DMS 6 software completely from their computer and wants to keep all the data in their current database so it can be used with a new installation of the software; they will need to create a backup file from the DMS Uninstaller. To create a backup file during the uninstallation process, the user will need to enter a check in the box next to "Backup database before uninstalling?" of the DMS Uninstaller screen. They will also need to use the "Browse" button to determine the location of where the backup file will be saved.

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The backup file saved will be a .bak only file that can only be used when the user is performing a new installation of the DMS 6 database. The .bak file is a single file that includes all the information for every Plant that was in the DMS database at the time of the uninstallation. It is **NOT** the same as the “Save a Copy of Plant” or “Export Database” functions in DMS; it can only be used when installing the DMS database.

9. Ultratrend DMS 4 – 5 Exporter

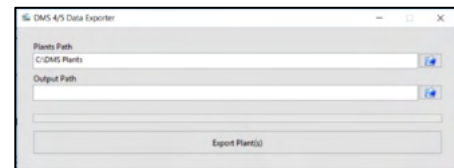
The DMS 4 - 5 Exporter is a separate application included with the installation of the DMS 6 software. It can be accessed from the UE Systems folder of the computer’s Apps or Programs list in the Windows Start menu. This application can be used to export data from a DMS 5 database and converted, so it can be imported into a DMS 6 database.



Note: DMS 5 is in a Microsoft Access database format and DMS 6 is in a Microsoft SQL database format.

Using the Exporter

Once the DMS 4 -5 Exporter has been opened, perform the following steps to convert and export DMS 5 Plant folders that can be imported into a DMS 6 database:



- 1) Create a new folder on the computer where the converted Plant folder from DMS 5 will be saved. It is advised that the folder name be the same as the original plant from DMS 5 to mitigate any confusion that could occur during the DMS 6 importing process.
- 2) **Plants Path** – This field is used to identify the DMS 5 Plant folder that needs to be exported. It defaults to the “DMS Plants” folder location but can be changed by selecting the browse folder on the right. If the “DMS Plants” folder is left selected it will export all the Plant folders located within it together. If the user has a significantly large database, it is recommended they select one Plant at a time to avoid a potentially lengthy conversion process.
- 3) **Output Path** – This field is used to identify the folder where the converted DMS 5 data will be saved. Use the bottom browse folder to the right of the Output Path field to locate the folder created in the first step. Once selected, the file path should be displayed in this field.
- 4) **Export Plant(s)** – When the user has chosen both paths, they can press the “Export Plant(s)” button to begin the exporting and converting process. There will be a progress bar showing how far the conversion process is from completion. Once completed the DMS 4 - 5 Data Exporter will disappear.
- 5) To import the converted Plant folders from DMS 5 into the DMS 6 database; please reference the “II. Basic Operation: 11.4. Import / Export Database” section of this manual for more information on importing and exporting databases.

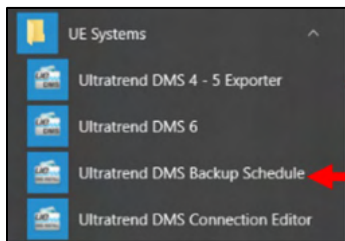
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10. Ultratrend DMS Backup Schedule

The DMS Backup Schedule provides the user with the ability to create database backups based upon a set schedule defined by that user. The user will be able create a one-time backup or set a schedule for that backup based upon days, weeks, or months.

Once configured, the backups will continue to be created without user notification based upon the previously defined schedule until that user selects a new schedule or generates a one-time backup. The backups will be stored in a default folder created by DMS 6 unless the user selects a new folder path when creating the backup. **The Backup Schedule is only located on the computer that has the Database.**

Scheduling the Backup

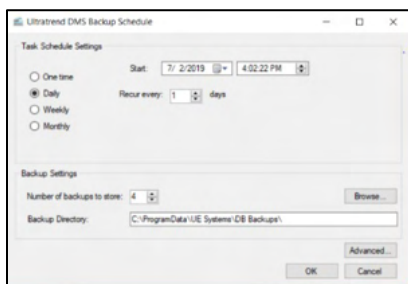
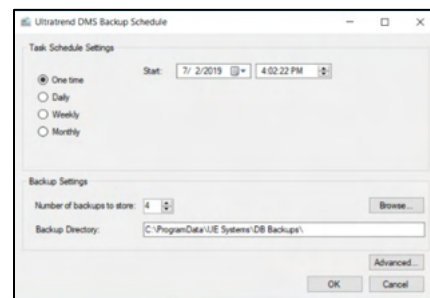


Open the start menu and select the UE Systems folder. The “Ultratrend DMS Backup Schedule” can be selected and opened from within this folder. The DMS Backup Schedule Screen will allow the user to schedule and create backup files of their DMS 6 database.

Creating a One-Time Backup

- 1) Select “One Time”.
- 2) Select where the backup file will be saved.
- 3) Click OK when finished. Backup will be created 1 minute after selecting OK.

This option will only create one backup file.



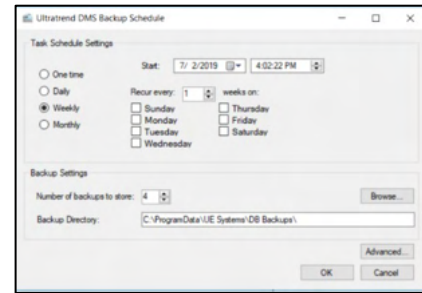
Creating Daily Backups

- 1) Select Daily, choose the start date and time of when the backups will occur.
- 2) Choose how often the backups will be created for “Recur every __ days.”
- 3) Select the number of backups to store and where the backup file will be saved.
- 4) Click OK when finished.

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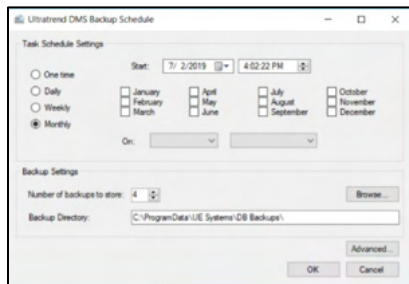
Creating Weekly Backups

- 1) Select Weekly, choose the start date and time of when the backups will occur.
- 2) Choose how often the backups will be created for “Recur every __ days.”
- 3) Select the days for the backups to occur.
- 4) Select the number of backups to store and where the backup file will be saved.
- 5) Click OK when finished.



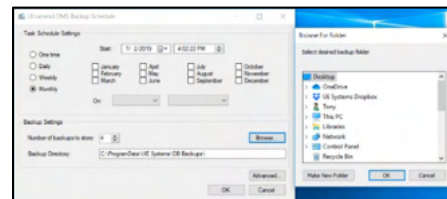
Creating Monthly Backups

- 1) Select Monthly, choose the start date and time of when the backups will occur.
- 2) Select the months for the backups to occur.
- 3) Choose which day the backup will be created for that month(s).
- 4) Select the number of backups to store and where the backup file will be saved.
- 5) Click OK when finished.

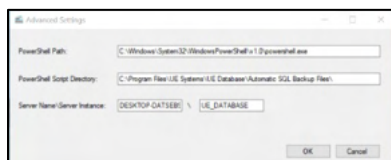


Changing the Backup Location

- 1) Select the browse folder.
- 2) Choose the new folder location.
- 3) Verify that the new file location selected is displayed in the Backup Directory field.
- 4) Select OK



Advanced Settings



Press the “Advanced” button in the bottom right corner of the DMS Backup Schedule window to open the Advanced Settings Screen.

This menu displays the path and directory of the PowerShell and script, along with the Server Name and Instance.

Note: This screen should not be changed unless special setting(s) is required by the current server or computer where the DMS database is installed.

11.DMS Admin Interface

Overview

Ultratrend DMS 6 User Manual

By default, DMS allows open access to all data in all plants. If an administrator would prefer to limit the plants users are able to access, they may use the DMS Administration Interface to do so.

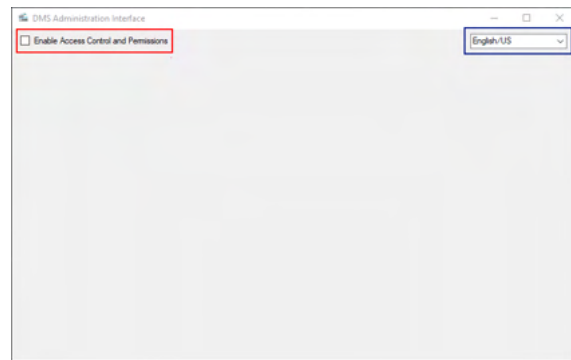
DMS supports two types of user authentication: built-in, where users and passwords are specified within the interface and permissions are assigned explicitly, and OpenID Connect integration, where user and plant information are received from an external server.

To access the DMS Admin Interface, the user needs to have permission to edit the `config\_privileged` table in the database. This is granted to any user who is part of the `UE\_DMS\_PRIVILEGED\_USER` database role. Windows administrators are automatically included in this role if Windows Authentication is in use. Use the DMS Connection Editor to change the credentials with which you access the Admin Interface.

Upon launching the DMS Admin Interface, the UI to the right is presented.

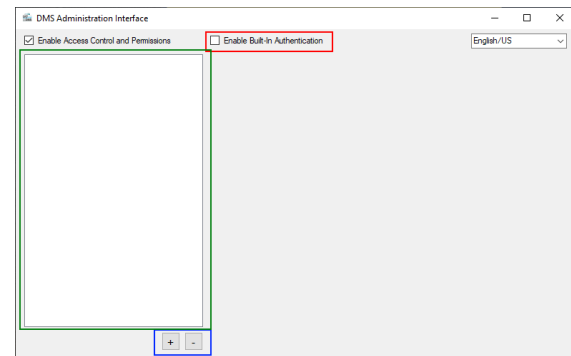
The red-highlighted checkbox is used to enable the authentication system. The blue-highlighted dropdown is used to change the language for the interface.

Upon checking the `Enable Access Control and Permissions` checkbox, the UI enables a few extra fields.



The red-highlighted checkbox is used to enable the Built-In Authentication system, which allows for creating and users with direct plant permissions entirely within DMS. The blue-highlighted +/- buttons are used to add/remove OpenID-Connect (OIDC) endpoints.

The green list box contains an entry for each authentication option: `DMS` will be listed at the top for built-in authentication, if enabled, while a user-entered name will be displayed for each OIDC option.

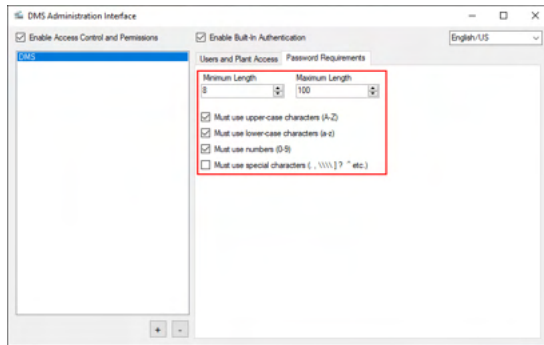


Built-In Authentication

With built-in authentication, users are created explicitly with individual passwords. Users have the option to be set as “Admin”. If they are “Admin”, they will have the ability to access all plants in the database without being given individual plant permissions. Otherwise, users will only have access to plants they are explicitly given access permissions for.

Configure Password Requirements

Ultratrend DMS 6 User Manual

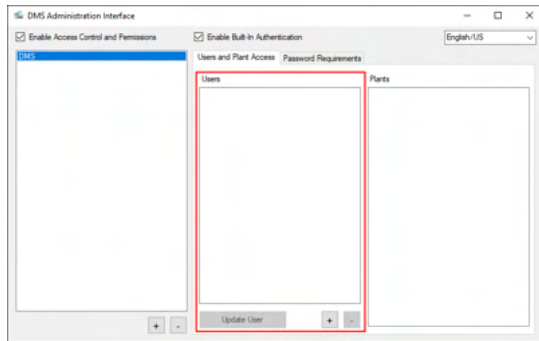


While not presently exposed in DMS, a future update will enable users to modify their own passwords.

Once that feature is available, these parameters will determine the complexity requirements for passwords.

These requirements are not imposed when passwords are set from the Administration Interface directly.

Configure Users



By selecting “Users” or “Probes” a list will be shown for all users or probes that have been created.

The “Update User” button is used to modify the password or “admin” status of a selected user.

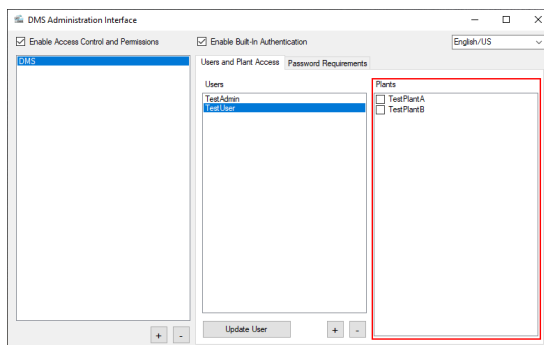
The +/- buttons are used to add or delete a user.

When updating a user, the “Username” field is not editable.

Creating New User

Select the “+” button to create a new user. Enter the “Username”, “Password”, and checkmark “Admin” (if access to all plants is needed).

Configure Plant Permissions for Users



After creating a user, they will not immediately have access to any plants. To grant access to plants, select the user’s name on the left, and then select the checkboxes next to each plant the user should have access to on the right.

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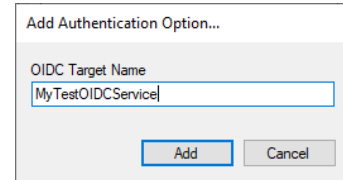
OpenID Connect Authentication

OpenID Connect authentication delegates users and permissions to an Identity Provider service.

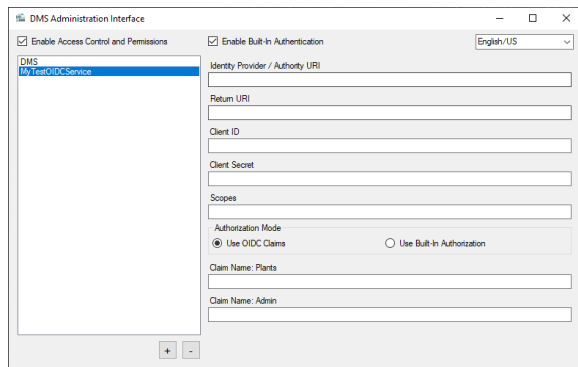
Create the OpenID Connect Authentication Option

Select the “+” at the bottom left of the Interface.

Note: If the OIDC option should be removed, select it, and use the “-” button at the bottom left of the Interface.

A small dialog box titled "Add Authentication Option...". It contains a text input field labeled "OIDC Target Name" with the value "MyTestOIDCService" entered. At the bottom right, there are two buttons: "Add" and "Cancel".

Configure the OpenID Connect Authentication Option

A screenshot of the "DMS Administration Interface" window. The "Enable Access Control and Permissions" and "Enable Built-In Authentication" checkboxes are checked. The "Identity Provider / Authority URI" field is selected. Below it are fields for "Return URI", "Client ID", "Client Secret", and "Scopes". The "Authorization Mode" section has two radio buttons: "Use OIDC Claims" (selected) and "Use Built-In Authorization". Below these are fields for "Claim Name: Plants" and "Claim Name: Admin". At the bottom left, there are "+" and "-" buttons.

The OIDC authentication option only needs to know how to connect to the OIDC provider.

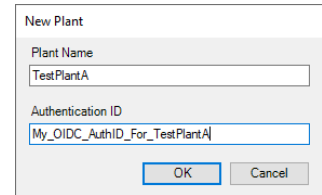
Note that there is a special case of OIDC and Built-In authorization working in combination, where user authentication (login) is handled by OIDC, but permissions are managed by the Built-In Authorization. To facilitate this, the “sub” claim returned by OIDC must match the “username” in built-in authentication.

OpenID Connect Field	Description
Identity Provider / Authority URI	This is the URI at which the OIDC provider can be queried. To confirm that the URI is correct, ensure that if “well-known/OpenID-configuration” is appended to it, a JSON document describing the open-id configuration is returned.
Return URI	This is the URI DMS will send to the Authority URI when authenticating. DMS does not have a return server, but many providers require this field to be used for security purposes.
Client ID	This field is optional, but may be used by the provider as an identifier to limit the claims that will be sent to DMS
Client Secret	This field is option, but standard in OIDC connections
Scopes	This field is a space-separated list of which claims should be requested when DMS authenticates. The standard “openid” scope will always be included in the request and does not need to be included here.
Authorization Mode	If set to “Use OIDC Claims”, then the Plants and Admin permissions will need to be specified by the OIDC server. If set to “Use Built-In Authorization”, then the “sub” claim will need to match existing users in the Built-In Authentication section.
Claim Name: Plants	This claim name identifies the claim(s) that will include the Authentication ID(s) for the user’s allowed plants. Allowable formats for the value of this claim in the OIDC response are: 1) JSON Array of strings, where each string element is an Authentication ID 2) Comma-separated list of Authentication IDs 3) Single Authentication ID (containing no spaces) Multiples of these claims are allowed, if the Identify Provider allows this.
Claim Name: Admin	This claim name identifies the claim name that will include a boolean (true/false, 1/0, yes/no, y/n, t/f) value indicating if the user should have access to all plants.

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DMS Configuration to Link to OpenID Connect

OpenID Connect authentication returns a list of “Authentication IDs” to decide which plant a user should have access to. These IDs are compared to the “Authentication ID” specified when a plant is created.



12.Silent Installation Guide

Installation Notes

Silent installation will use the same default parameters as the UI version of the installer users, so command-line options are more like overrides than requirements.

Installation often requires restarting the computer. The silent installer will not do this automatically, so machines should be restarted either by the user or by a script after installation.

Installation Arguments

The installer supports silent installation via supplied command-line parameters if the “-quiet” argument is set. These parameters are passed according to the format:

```
'DMS Installer.exe' -quiet -paramName1 value1 -paramName2 value2 ...
```

Parameter names are not case-sensitive, and parameter values are not case-sensitive for parameters with fixed values. Any value can be omitted to use default values

Parameter Name	Parameter Value	Action
Mode	ui	Installs the DMS User Interface and related dependencies
	server	Installs the 4Cast Controller Service
	database	Installs the SQL Server database, tables, and users
	admin	Installs the Admin Interface
	normal	Installs the DMS User Interface, 4Cast Controller Service, and SQL Server Database
	full	Installs the DMS User Interface, 4Cast Controller Service, SQL Server Database, and Admin Interface
	(comma-separated list without spaces)	Installs all selected modules. Example: 'DMS Installer.exe' -mode ui,database would install the DMS UI and the database
DatabaseInstallMode	install	Installs SQL Server, if not already installed, with the instance name specified by <i>DatabaseConnServer</i> on the local machine (ignores <i>DatabaseConnIP</i>)
	existing	Connects to the existing SQL Server instance at <i>DatabaseConnIP:DatabaseConnPort</i> (if remote) or named <i>DatabaseConnServer</i> , if local
DatabaseInstallPath		Specifies the directory to which the database should be installed if <i>DatabaseMode</i> is “install”
DatabaseImportPath		Specifies the location of the .bak file that should be imported into the database instance before being upgraded to the current database version
DatabaseConnMode	windows	Configures Windows Authentication only

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Parameter Name	Parameter Value	Action
	SQL	Configures Windows Authentication and SQL Server username/password authentication. Creates the user specified by <i>DatabaseConnUser</i> with password <i>DatabaseConnPassword</i> .
DatabaseConnUser	(SQL Username)	Sets the name for the user for SQL Database (when <i>DatabaseConnMode</i> is “SQL”)
DatabaseConnPassword	(SQL Password)	Sets the password for SQL Database user <i>DatabaseConnUser</i> (when <i>DatabaseConnMode</i> is “SQL”)
DatabaseConnIP	(SQL Network Address)	Sets the IP or computer name of the machine running the database. Ignored if installing the database <i>DatabaseMode</i> is “install”
DatabaseConnPort	(SQL Server Port)	Sets the TCP Port exposed on the machine running the database.
DatabaseConnServer	(SQL Instance Name)	Sets the name of the instance to be installed if <i>DatabaseConnMode</i> is “install” or to be referenced if <i>DatabaseConnMode</i> is “existing” and <i>DatabaseConnIP</i> is “.”
ServerConnPort	(4Cast Controller Service Port)	Sets the port to be opened for the 4Cast Controller Service is the “server” is being installed

Installation Examples

To run a normal installation with default options (a “simple” installation):

```
'DMS Installer.exe' -quiet
```

To run a normal installation with default options (a “simple” installation) using PowerShell. Note the use of the loop to await completion (theoretically, the -Wait flag would have the same effect, but this fails at the time of this writing):

```
$install = Start-Process '.\DMS Installer.exe' -ArgumentList '-quiet' -PassThru  
while (-not ($install.HasExited)) { Start-Sleep -Seconds 5 }
```

To install the DMS UI targeting a remote database with Windows Authentication:

```
'DMS Installer.exe' -quiet -mode ui -DatabaseConnMode windows -DatabaseConnIP 10.11.12.13
```

To install the Database only with SQL Server Authentication at the default location:

```
'DMS Installer.exe' -quiet -mode database -DatabaseConnMode sql -DatabaseConnUser my_user -  
DatabaseConnPassword my_password
```

Uninstallation Notes

The uninstaller is located at:

```
%ProgramFiles%\UE Systems\Uninstaller\DMS Uninstaller.exe
```

Uninstallation often requires restarting the computer. The silent uninstaller will not do this automatically, so machines should be restarted by either the user or by a script after uninstalling. The uninstaller removes modules individually with a best-effort approach to cleanup when doing so. If all modules are removed, then the uninstaller deletes all directories. Note that some dependencies

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may be used by other applications (such as LabVIEW and VISA Runtimes), and DMS cannot detect if that is the case, so while they may be installed for DMS, they will not be uninstalled. If no other applications are using these runtimes, they may be uninstalled separately.

Uninstallation Arguments

The uninstaller supports silent installation via supplied command-line parameters if the “-quiet” argument is set. These parameters are passed according to the format:

```
'DMS Uninstaller.exe' -quiet -paramName1 value1 -paramName2 value2 ...
```

Parameter names are not case-sensitive, and parameter values are not case-sensitive for parameters with fixed values.

Parameter Name	Parameter Value	Action
Mode	ui	Uninstalls the DMS User Interface
	ui_driver	Uninstalls the CP210x driver required for DMS
	server	Uninstalls the 4Cast Controller Service
	database_tables	Uninstalls the database tables, while retaining the instance
	database_instance	Uninstalls the database instance entirely
	admin	Uninstalls the Admin Interface
	full	Uninstalls everything
	(comma-separated list without spaces)	Uninstalls all selected modules. Example: 'DMS Uninstaller.exe' -mode ui,ui_driver,server' would install the DMS UI, drivers, and the 4Cast Controller Service
BackupPath		File path of the .bak file to be created before uninstalling the database. Omit to skip backup.

Uninstallation Examples

To uninstall everything:

```
'DMS Uninstaller.exe' -quiet
```

To uninstall everything using Powershell:

```
Start-Process 'DMS Uninstaller.exe' -Wait -ArgumentList '-quiet'
```

To uninstall the DMS UI only:

```
'DMS Uninstaller.exe' -quiet -mode ui,ui_driver
```

II. Basic Operations

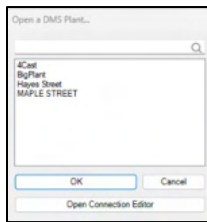
13.File Menu

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This menu provides numerous basic functions centered around the management and sharing of Plant folders; the foundation of the DMS database.

Open Plant...	Ctrl+O
New Plant...	
Import / Export Database...	
Login	
Logout	
Exit	Ctrl+Q

Open Plant



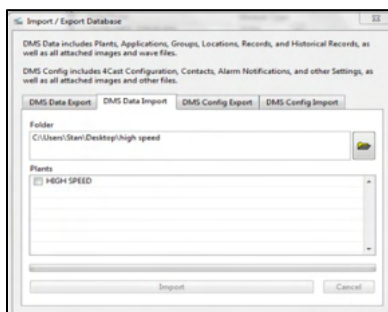
When choosing the Open Plant option from the File menu, the user will be provided with a list of previously created Plants. By selecting one of these Plants the DMS program will populate with the hierarchy and information pertaining to that Plant. The user may have multiple Plants open at one time that can be navigated by using the DMS database hierarchy.

For databases with a large list of Plants, the active search filter is available at the top of the Open DMS Plant screen to help users find their desired plant from the list.

New Plant

The fundamental starting point for creating a new database in the DMS 6 software is by first creating a New Plant. When the New Plant option from the File menu is selected, the user will be prompted to enter a name for that plant. This will also be the name of the Plant folder that will be created to house all information added to that Plant in the future.

Import / Export Database



Allows the user to import Plants from other locations to be incorporated within their own database and/or be able to export their own Plants to be saved as a backup or be imported somewhere else. Users are also able to export and import their 4Cast configurations.

Data Transfer Options

DMS Data Export – This option allows the user to export a Plant folder from their database. The exported copy will be identical to the original Plant and can be used as a backup if needed. All the data, images, and sound files will be included in the export.

DMS Data Import – Users can import Plant folders from other databases to their DMS database by selecting this option. The new Plant will be available in the “Open a DMS Plant” List with the other existing Plants in the database. All the data, images, and sound files will be included in the import.

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4Cast Config Export – This option allows the user to export their 4Cast configuration settings found in the 4Cast Manager.

4Cast Config Import - Users will be able to import 4Cast configuration settings into their 4Cast Manager with this option.

To Import / Export Data and Configuration settings; perform the following steps:

- 1) Select the Data Transfer Option.
- 2) In the Folder field, navigate to the folder location where the data will be sent to or received from, based upon the Data Transfer Option selected, and press the “Current Folder” button.
- 3) Enter a check mark in the box next to each Plant listed for the data to be transferred.
- 4) Press the Import / Export button to complete the process.

Note: For larger databases, it is recommended that the user import or export them individually to reduce the amount of time needed for the conversion process and to mitigate the potential for data transfer interruption.

Login / Logout

When the access control and permissions have been enabled through the DMS Administration Interface the Login / Logout options will be utilized.

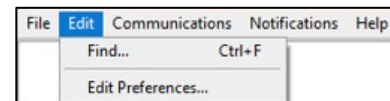
Exit Program

This will close the DMS program for the end-user.

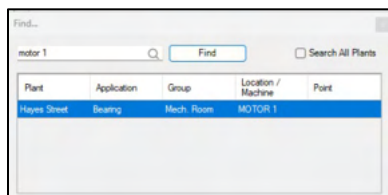
Note: If Plant folders were left open when a user exits the DMS program they may become Locked Plants for other users.

14.Edit Menu

This is where the database search feature and general user Preferences can be found. Including a check for updates option and the Spectralyzer file path location.



Database Search using Find

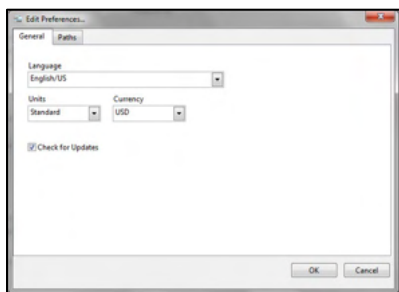


The Find feature provides users with the ability to search their database for any Hierarchy Item and automatically open it when it is selected from the list.

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Note: If the “Search All Plants” box is unchecked it will only find what is entered into the search field from the Plants currently open in the Hierarchy window.

Edit Preferences: General Tab



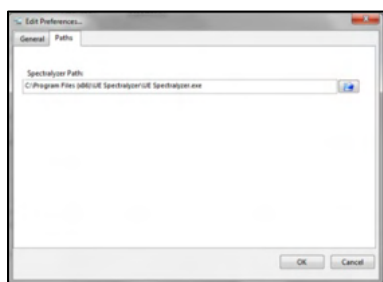
Languages - Select from a list of languages, restart the DMS Program to implement the change.

Units: Standard or Metric measurements

Currency - US dollars, British Pound, or Euros

Check for Updates - When checked the program will notify the user of any new updates that are available to be downloaded from the UE Systems Website.

Edit Preferences: Path Tab



Spectralyzer Path - If the UE Spectralyzer program is installed on the same computer as the DMS 6 program, it will list the path to the Spectralyzer executable file.

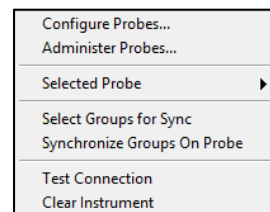
Note: The Spectralyzer Path defaults to: (C:\Program Files\UE Spectralyzer\UE Spectralyzer.exe) and should never be modified or changed.

15.Communications Menu

This menu is used by the DMS database to manage connections with Ultraprobe equipment to allow for the downloading and uploading of data to the DMS database.

For single group mode, data will be uploaded from the Group position of the DMS hierarchy to Ultraprobe 401, 9000, 10,000 and 15,000. The data collected from Ultraprobe 401, 3000, 9000, 10,000 and 15,000 will then be downloaded back into the selected Group to be stored.

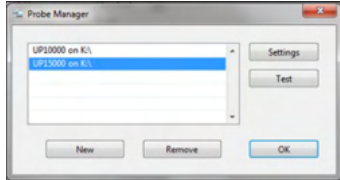
For multi-group mode using the Ultraprobe 15,000B, data will be uploaded and downloaded using the “Select Groups for Sync” and “Synchronize Groups on Probe” options. When configuring the probe for this, the UP15000B probe configuration will need to be selected.



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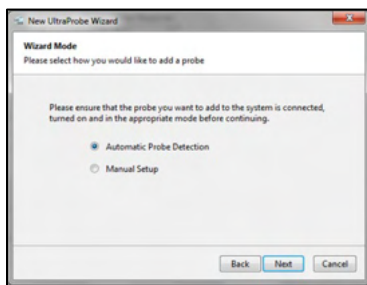
For single-group mode using the Ultraprobe 15,000B, data will be uploaded and downloaded using “Send Group to Probe” and “Retrieve Group from Probe” options by right-clicking the Group name in the DMS Hierarchy. When configuring the probe for this, the UP15000 probe configuration will need to be selected.

Configure Probes



Each Ultraprobe model is different and therefore DMS must be configured to the specific Ultraprobe being used for data transfer. Selecting Configure Probes opens the “Probe Manager” window which will display a list of Ultraprobe instruments that have been previously set up and available. From this window the user can test, remove, and change the settings of an existing probe or create a new configuration.

To add a new configuration for your Ultraprobe, click on the New button located at the bottom of the “Probe Manager” window to open the “New Ultraprobe Wizard.”



There are two methods of establishing a new connection between an Ultraprobe and the DMS 6 database: Automatic Probe Detection and Manual Setup.

Automatic Probe Detection

When selecting this option for probe detection, first ensure that the Ultraprobe is connected to the computer. If using an Ultraprobe 3000 or 9000 model, this will be done by direct connection with the computer. If using an Ultraprobe 401, 10,000, 15,000 or 15,000B; that connection is made by inserting a SD card into the computer. DMS will search for the Ultraprobe and populate a list with available selections that were detected based upon the connection method that was used to identify the Ultraprobe. Select the correct Ultraprobe from the list to register it for future connections with the DMS software.

Note: Always try using Automatic Probe Detection first before attempting a Manual Setup.

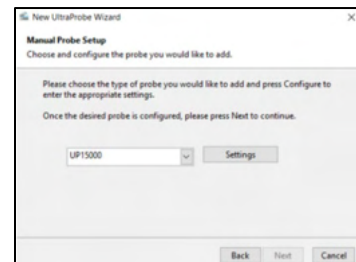
Manual Probe Setup

If utilizing this option, all the required information to configure the connection between the Ultraprobe and the DMS 6 database can be manually entered.

To manually setup the probe, perform the following steps:

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- 1) Choose the desired probe from the dropdown list provided.
- 2) Press the Settings button; enter the requested configuration information needed to make the connection and press OK.
- 3) Press Next and then Finish to test and complete the connection.



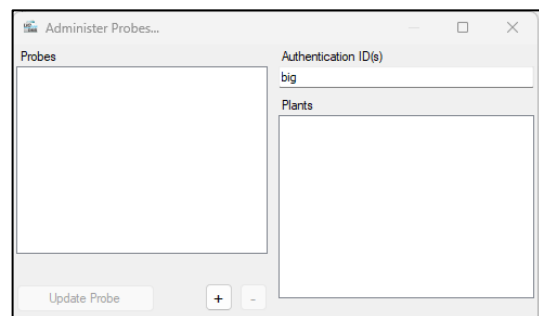
Selected Probe

This lets the user know which probe has been selected for communication with DMS. If multiple Ultraprobes are being used, it is recommended to routinely check this before uploading and downloading data.

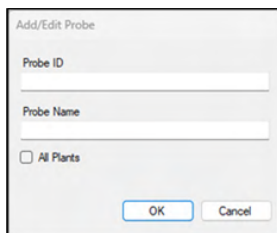
Administer Probes

When “Access Controls and Permissions” are enabled in the DMS Admin Interface, the Administer Probes option under the Communication Menu can be used to assign what Plants are accessible for an Ultraprobe 15,000B using multi-group mode.

If the DMS Admin Interface is not being used or the DMS user does not have “Admin” permissions assigned to them in the Admin Interface, then this option will be greyed out.



Add / Remove Probe



Select the “+/-” button to add or remove a probe.

To add a probe, enter the Probe ID, Probe Name, and All Plants (if access to all plants is needed).

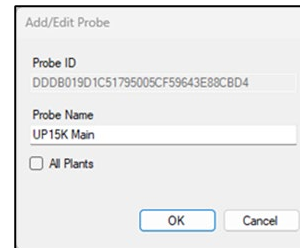
Note: The Probe ID for Ultraprobe 15,000B can be found in the Info/Software Versions screen on the instrument or in the “hw.id.dms” text file on the SD card.

Update Probe

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The “Update Probe” button is used to modify an existing probe.

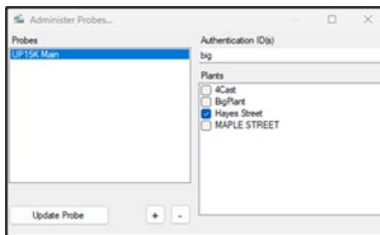
When updating a probe, the “Username” field is not editable.



The 'Add/Edit Probe' dialog box contains the following fields and controls:

- Probe ID:** DDD8019D1C51795005CF59643E88CBD4
- Probe Name:** UP15K Main
- Plants:** A checkbox labeled 'All Plants'.
- Buttons:** 'OK' and 'Cancel' at the bottom right.

Granting Plant Access for Probes

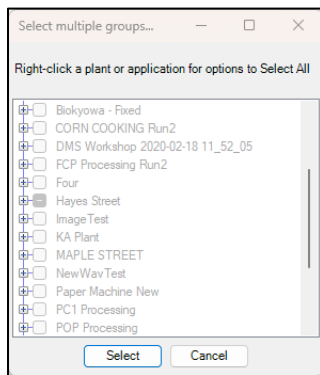


After a probe has been added, it will not immediately have access to any plants.

To grant access to plants, select the probe’s name on the left, and then select the checkboxes next to each plant that the probe should have access to on the right.

Alternatively, the “Authentication ID” field can be used to identify and assign to the probe any Plants that have the corresponding ID.

Select Groups for Sync



When using an Ultraprobe 15,000B in multi-group mode, users can select which Groups to send to their SD card. This will include all the Group Hierarchy and Baseline information needed for data collection. New data collected can then be uploaded quickly to DMS through syncing with WiFi directly from the Ultraprobe or with the SD card using the “Synchronize Group on Probe” option.

To select all the Groups in a specific Plant or Application, right-click the name and choose Select All from the menu options.

Note: If the DMS Admin Interface is enabled, the SD card must be initialized on first use by placing the card into the UP15,000B and turning it on briefly so it can create the Probe ID file on the card that will be needed to identify it in the Admin Interface.

Synchronize Group on Probe

When using an Ultraprobe 15,000B in multi-group mode, all data collected on the SD card can be synchronized between the DMS database and the Ultraprobe for any groups that were previously sent to the SD card.

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Note: If the DMS Admin Interface is enabled, the SD card must be initialized on first use by placing the card into the UP15,000B and turning it on briefly so it can create the Probe ID file on the card that will be needed to identify it in the Admin Interface.

Test Connection

After an Ultraprobe has been connected to the computer, make sure the data transfer will be successful. Use Test Connection to be sure the SD or USB connection is working.

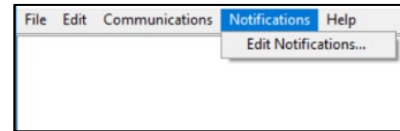
Clear Instrument

This will delete data only from the Ultraprobe 3000 & 9000 models. The instrument must be connected and in setup mode for the data to be cleared.

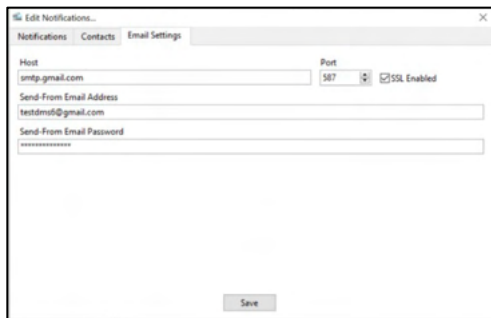
Note: To delete the old data from the SD card, the user will need to go into the SD card and manually delete all the files and folders. Another option is to reformat the SD card to ensure all the old data is removed.

16. Notifications Menu

This feature can be used by the user to establish alerts based upon notification criteria to be sent to the user by email, text or webhooks. These alerts can be triggered whenever the data is downloaded to DMS. For the user to receive a notification, a Point in the DMS hierarchy must meet or exceed the notification criteria they have established for a Plant that the user has chosen to monitor.



Edit Notifications: Email Settings Tab



From this tab on the Edit Notifications window, the end-user will be able to enter the appropriate access information for the email address that will send the notification from the “host” mail server.

Host – The email server outgoing mail service. (Example: Gmail host outgoing server is smtp.gmail.com).

Port – This is the port number that the outgoing email service uses. This information can often be found for most free email providers through the computer’s web browser. If the user is unable to find

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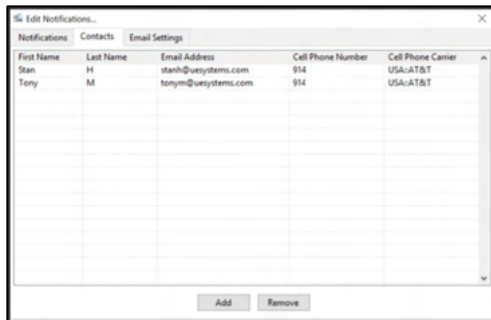
this information, they may need to contact their IT department for assistance, (Example: The Gmail outgoing server uses port 465 and/or port 587.)

SSL Enabled – When enabled, it increases the security of the connection by encrypting the email. Most mail servers will flag emails that are not secured and may block the email from reaching its destination.

Email Address - The end-user will need to add an email address that will send the notification from the “host” mail server. (Example: If the user created an email named dms6@gmail.com. The notifications would show dms6@gmail.com as the sender. This can be used as an identifier that the notification(s) are coming from their DMS software.)

Password – Enter the password here for the email address that will be sending the notifications.

Edit Notifications: Contacts Tab



First Name	Last Name	Email Address	Cell Phone Number	Cell Phone Carrier
Stan	H.	stanh@uesystems.com	914	USA:AT&T
Tony	M.	tonym@uesystems.com	914	USA:AT&T

The Contacts tab in the Edit Notifications window is used to manage the contact information needed for notifications to be received by individuals. From here, the user can review the existing list of contacts and edit or remove them as needed. To edit an existing contact double left-click their information in the contact list. Use the Remove option when the contact is selected / highlighted in the list to delete their information.

To create a new contact, press the Add button on the Contacts tab to open the New Contact window and enter the requested information.

Creating a New Contact

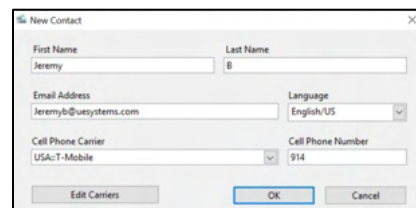
First/Last Name - The contact that will be receiving the notifications.

Email - The contact's address the notification will be sent to.

Language - Select the language that will be used for the notifications.

Cell Phone Carrier - The carrier for the contact's cell phone that will be receiving notifications via text. (This option is primarily for North America)

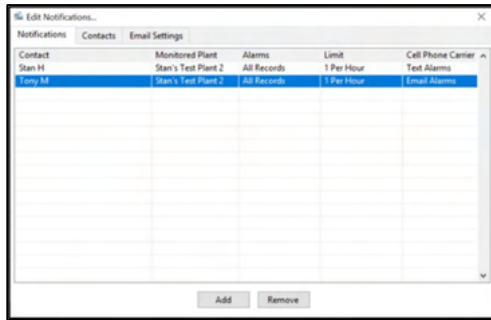
Cell Phone Number - The contact's cell phone number that they will use to receive the text notifications.



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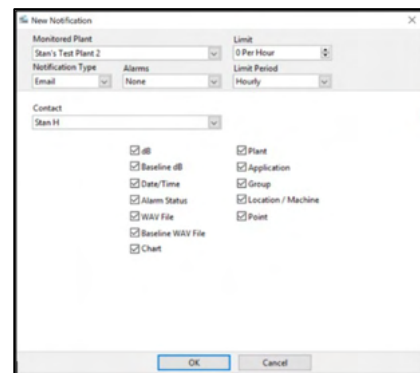
Edit Carriers - If the contact's carrier is not listed as a Cell Phone Carrier selection, they can add their carrier here if they know their MMS (Multimedia Messaging). This information can often be found through the computer's web browser.

Edit Notifications: Notifications Tab



The Notifications tab in the Edit Notifications window is used to create and manage the specific parameters that will determine when a notification is sent and the contact to which they are sent. From here, the user can also review the existing list of notifications and edit or remove them as needed. To edit an existing notification, double left-click their information in the notification list. Use the Remove option when the notification is selected / highlighted in the list to delete it.

To create a new notification, press the Add button on the Notifications tab to open the New Notification window and enter the requested information.



Creating a New Notification

Monitored Plants – From here, the user can select the DMS Plant that the notification criteria will be applied to.

Alarms – The type of alarm that will be shown in the notification. The user can choose between None, All Alarms, High Alarms, or All Records.

Limit Period - How often the selected contact will receive the notifications by Minutes, Hours, Daily, Weekly, or Monthly.

Limit – The number of times within the Limit Period that the contact will receive notifications.

Notification Type – This determines what method of communication is used to send the notification to the contact from DMS 6. The available options are by Text, Email, or Webhooks. Note: Only the Email Notification Type includes Notification Data options for Wav File, Baseline Wav File, and Chart.

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Contact – This is used to assign a contact based upon those listed in the “Contacts” tab, to the notification being created.

Notification Data – This determines the data from the DMS database that will be included in the notification.

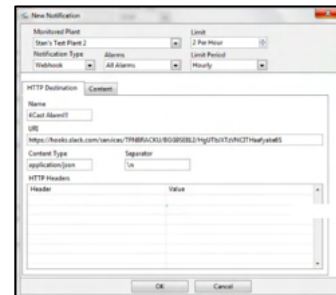
Additional Considerations: Webhooks

When an event occurs, DMS as the server-side application will send a POST request to the URL, or webhook, with the specified content. The content can be generated based on webhook tokens that are available from the Help button of the “Custom Content” tab when creating a new notification. DMS, as the server-side application receiving the webhook from the client-side application, can define the structure and format of the information shared.

Webhooks are used by numerous client-side applications to send notifications. These applications can come in many forms such as websites, programs, and even apps: i.e., Microsoft Teams. The user will need to create a webhook either on another website or program so that an individual or a team of people would be able to receive the same notification at the same time.

To activate this notification, the user will need to select the Webhook Notification Type.

When the Webhook Notification Type is selected, the New Notification window will change to include two Webhook Customization Tabs: HTTP Destination and Content.



HTTP Destination Tab

This tab is used to establish communication from the DMS database to external applications and programs. The fields included on this tab can be seen in the previous figure.

URI/URL (Web Address) - Once the webhook has been created on the client-side application by the user, they would then enter the URI/URL into the URI field of the New Notification window for their team to receive the alarms.

Content Type – This is the type of file that it used; JSON file is typically.

Content Tab

When the Content tab is selected, there will be two additional tabs available to allow the user to configure Custom and Auto Content.

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Custom Content – The user can use this option to customize what is shown in the webhook notification.

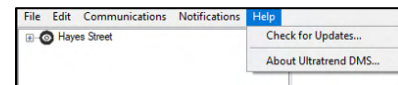
Auto Content – This option will allow the user to select the Notification Data that will be included in the webhook notification when the notification criteria are met.

Webhook Example: Using Microsoft Teams

- 1) Create a channel through Microsoft Teams
- 2) Add members that will receive the notifications within channel
- 3) Click the 3 dots within the channel and select “Connectors”
- 4) Select “Configure” for Incoming Webhooks
- 5) Create name for the incoming webhooks then select create button
- 6) Copy the newly created URL and then select done button
- 7) Open DMS, click “Notifications”
- 8) Click add button for notifications tab
- 9) Select the Plant that will be monitored
- 10) Click the Webhooks from dropdown from notification type
- 11) Select the type of alarm, limit, and limit period
- 12) From the HTTP Destination tab, create name of the webhook
- 13) Paste the URL within the URI
- 14) Select the “Content” tab, then “Auto Content” checkmark the information that will be coming through the Microsoft Teams channel.
- 15) Select ok when finished

17. Help Menu

This menu is where the user can manually check for updates and find UE Systems contact info.



Check for Updates

If the DMS 6 program has access to the internet, the user can prompt the program to check the UE System’s website for a newer version. If there is an updated version, the user will be given the option to download that version from the website.

About Ultratrend DMS

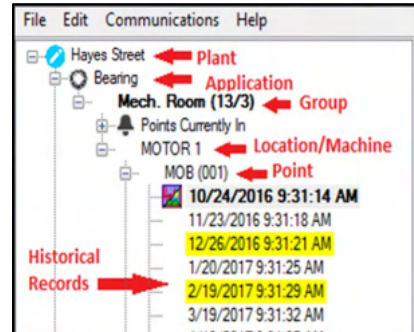
When this option is selected from the Help menu, a window will appear showing information about the current version of the DMS 6 software installed. The contact information for UE Systems Inc. can also be found in this window including a link to the UE Systems website.

III. Database Management

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18. Understanding the Database Hierarchy

Most functions for viewing and managing a DMS Database can be found in the hierarchy window on the left side of the DMS program. This is where the database hierarchy will populate when a DMS Plant is created or opened.



Plant

The Plant is the highest level of the DMS hierarchy and the foundation of the database. A user can create and view an unlimited number of Plants. All essential data is contained within the Plant including the: Application, Group, Location/Machine, Test Point (the numbered location), and Historical Records. To view any of these components, the Plant must be opened. A Plant can have an unlimited number of Groups included in its hierarchy.

Application

The Application determines the type of information to be uploaded and downloaded from the Ultraprobe. Each Application has its own unique record structure. A Plant can only contain the following six Applications:

- **Bearings**
- **Electrical**
- **Generic**
- **Leak**
- **Steam**
- **Valves**

An Application can contain an unlimited number of Groups (this is a general area that includes the subject test equipment, it is also known as a “Route”). An Application can be selected when a Plant is opened. When creating a new Plant, all six Applications will also be created in the DMS hierarchy.

Group

Creating a list of testing locations and organizing them into a route is identified as a Group in the DMS hierarchy. A Group must be assigned to one of the six Applications. The information collected in the Group will be placed in fields that relate solely to that specific Application. An unlimited amount of historical information can be held in a Group.

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The Group is also what defines the records that are sent to the Ultraprobe. It can include a sequential set of records ranging from 1 to 400. These records reflect the information found in the 400 memory locations of the Ultraprobe. Only one Group can be sent to an Ultraprobe at a time.

Location / Machine

Often considered the primary asset or piece of equipment to be tested, the Location / Machine can include one or more specific places identified for testing known as Points. A Location is assigned to a Group, which determines the number of characters it can have in its name when it's created: 8 or 13.

Point / Record

This is the specific Point where the test measurement is taken. It will contain all the Historical Records listed chronologically by date of entry. The Point / Record may be created using 8 or 3 characters depending upon what is selected in the Descriptor Format during Group creation. The Points will be listed sequentially in the Group. Therefore, the first Point will be automatically assigned 001, up to a maximum 400.

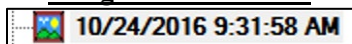
When data is entered into the Point / Record, a Historical Record will be created. After it is created, either by downloading data from the Ultraprobe or from being manually entered, the Historical Record will be listed under each Point as the date and time of when it was collected.

Historical Record

The Historical Record can be found at the lowest level of the DMS hierarchy. Each time an inspection is performed, a Historical Record is created with the data that was collected based upon the Application. The Historical Record will include the date and time of the inspection and will populate under the specific testing Point from where the data was taken. Multiple Historical Records can accumulate over time and will be seen in chronological order under the Point in the DMS hierarchy it is assigned. The user may have an unlimited number of Historical Records for each Point.

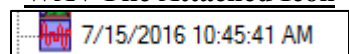
An icon will be displayed next to any Historical Records in the DMS hierarchy that have images or sound files attached to them. Different icons are used based upon what is attached as shown in the examples below:

Image Attached Icon



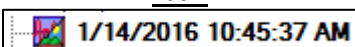
When an image has been attached to a Historical Record, an icon will be displayed to the left of it.

WAV File Attached Icon



When a WAV file has been attached to a Historical Record, an icon will be displayed to the left of it.

Image and WAV File Attached Icon



When an image and WAV file have been attached to a Historical Record, both icons will be displayed to the left of it.

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Baseline Record

The first entry of a Historical Record is defaulted by the program as the Baseline Record. A Baseline Record can be identified in the DMS hierarchy by the bold text it is shown in. This may be changed by identifying another Historical Record assigned to the same Point as the Baseline Record. Enter a check in the Baseline checkbox from the “Record Information” tab, and the Baseline Record will change to the one selected. It is the baseline record that is uploaded to an Ultraprobe. The baseline information is used to compare with new test data as it is being collected and to establish alarm levels.

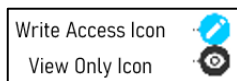
19. Building a Database

Within DMS 6, there are numerous tools and options for customizing a database hierarchy and most of them can be accessed from the hierarchy window. The ability to create, rename, delete, move, and restore hierarchy items in the DMS database can all be found in this section.

Accessing a Plant from the Hierarchy

The first step to creating a database starts at the Plant level. An existing Plant can be opened, and a new Plant can be created not only from the “File Menu”, but also from the hierarchy window itself. Right clicking an empty area in the hierarchy window will open a menu providing these options.

Enable Write Access



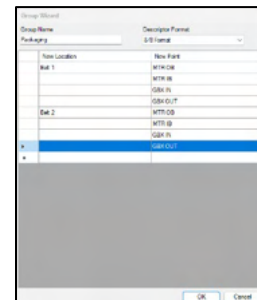
When a Plant is opened from the “Open Plant” screen it will initially be in “View Only”. To perform any activities in DMS that would create, delete, or modify

data, “Enable Write Access” will need to be selected by right clicking the Plant name. To the left of each Plant name in the hierarchy window will be an icon identifying if write access is enabled or not.

New Group by Wizard

To create a “New Group by Wizard”, perform the following steps:

- 1) Open an existing Plant.
- 2) Right-click the Application to open the hierarchy menu.
- 3) Select “New Group by Wizard” from the menu.
- 4) Enter the Group Name in the “Group Wizard”.
- 5) Select the Descriptor Format from the dropdown.
- 6) Enter new Locations and corresponding Points.
- 7) Press the OK button when finished.



Multiple Locations and Points can be entered using copy/paste functionality by right clicking and selecting the option from the menu or by using the standard copy/paste shortcuts CTRL+C/CTRL+V.

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Note: The New Location field can be left blank if the Point being created correlates to the last Location entered.

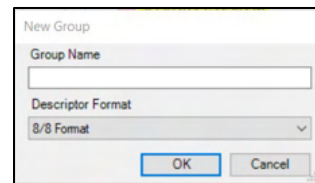
Adding Hierarchy Items (Manually)

The user can manually add new Groups, Locations, Points, and Historical Records individually to the DMS hierarchy.

New Group

To manually add a new Group, perform the following steps:

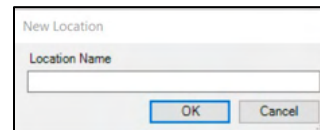
- 1) Right-click the Application name where it will reside.
- 2) Select “New Group” from the menu.
- 3) Enter the new Group name in the field provided.
- 4) Choose the Descriptor Format; this determines the number of characters in the Location / Point name.
- 5) Press OK to create the new Group.



New Location

To manually add a new Location, perform the following steps:

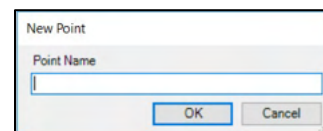
- 1) Right-click the Group name where it will reside.
- 2) Select “New Location” from the menu.
- 3) Enter the new Location name in the field provided.
- 4) Press OK to create the new Location.



New Point

To manually add a new Point, perform the following steps:

- 1) Right-click the Location name where it will reside.
- 2) Select “New Point” from the menu.
- 3) Enter the new Point name in the field provided.
- 4) Press OK to create the new Point.



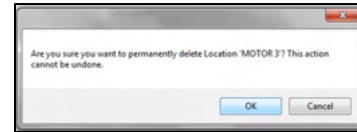
New Historical Record

To manually add a new Historical Record, right-click the Point name where it will reside. Select “New Historical Record” from the menu. A new record will be created with the current date & time stamp. The user will need to enter any specific data they want associated with that Historical Record from the “Record Information” tab.

Removing Hierarchy Items (Permanently)

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The user can permanently remove a hierarchy item from the DMS database by right clicking the item and selecting “Permanently Delete” from the menu.

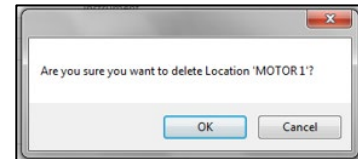


All Historical Records and any other hierarchy levels included under that item will be removed. The user will receive confirmation completing the process once accepted.

Note: Be aware that any hierarchy item permanently deleted will NOT be recoverable by the Restore function.

Removing Hierarchy Items (Temporarily)

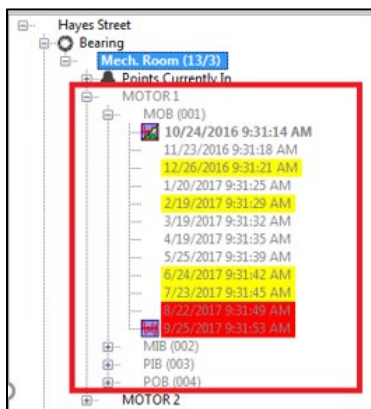
The user can temporarily remove a hierarchy item from the DMS database by right clicking the item and selecting “Delete” from the menu. All Historical Records and any other hierarchy levels included under that item will be removed. The user will receive confirmation completing the process once accepted.



This is also known as a “Soft Delete” and any items removed in this manner can be restored to the active hierarchy from the Trash bin by the user if needed.

Managing the Database Trash

The DMS 6 database utilizes an inactive area of the database known as “Trash” to allow the user to manage hierarchy items that have been temporarily deleted or “Soft Deleted”. By utilizing the “Trash” area of the database, hierarchy items can be both returned to active database with Restore or permanently deleted with “Empty Trash”.



Show Trash - To view temporarily deleted hierarchy items, the user can right-click an area in the DMS hierarchy and then select “Show Trash” from the menu. This will allow all levels under that item that have been deleted to be shown in grey or subdued text. A check mark next to “Show Trash” in the hierarchy menu will identify it is turned on.

Empty Trash - To permanently delete all hierarchy items in the “Trash”; the user can right-click an area in the DMS hierarchy and then select “Empty Trash”. This will remove all hierarchy items that were previously deleted under the item that was selected.

Restoring Hierarchy Items

This function can be used to return any hierarchy items that were temporarily removed or “Soft Deleted” to the active database. The user has two options for restoring a hierarchy item, which can be

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accessed through the hierarchy menu. When the user right-clicks an item in the DMS hierarchy, they can choose one of the below options to perform the restore.

Restore Deleted Items – This option will restore all hierarchy items located under the item selected.

Restore This Item – This option will restore the specific item selected.

Renaming Hierarchy Items

The user can rename anything within the DMS hierarchy by right clicking the hierarchy item and selecting “Rename” from the menu. Once the changes have been made, press “enter” to apply.

Copy & Paste Hierarchy Items

This function can be used to copy a hierarchy item and paste it into another hierarchy with the following exceptions:

- The Group Descriptor Format must match.
- It must not create a duplicate.
- The Application must match.

To use the Copy function, right-click the hierarchy item and select “Copy” from the menu. To use the Paste function, right-click the hierarchy item where it is to go and select “Paste” from the menu.

Note: Be aware that the data that is being copied will copy all data below that entity to the new location.

Moving Hierarchy Items

Users will be able to rearrange their databases by dragging and dropping hierarchy items. They can move their Locations and Points within an existing Group or move them to a different one entirely. They can also move an entire Group from one Plant to another by dropping it onto an Application.

To move an item in the hierarchy, left click and hold to drag it. Next, drop it to either an area in the current Group or into another one with the following exceptions:

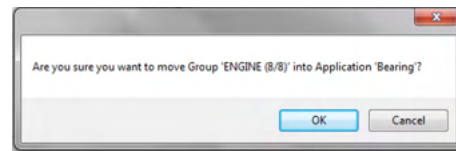
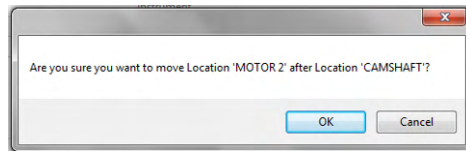


- The Group Descriptor Format must match.
- It must not create a duplicate.
- The Application must match.

Note: The symbol to the left will be shown if the attempted drag & drop would be an illegal move; except if it would create a duplicate in which case the move would still not be accepted.

When moving a hierarchy item within the same level of the hierarchy, it will be placed after the hierarchy item it is dropped on. When moving a hierarchy item to a higher level of the hierarchy, it will be placed within the hierarchy item it was dropped on. In both instances, the user will receive confirmation to complete the move.

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Note: Any Historical Records attached to the hierarchy item will be moved with it.

20. Navigating the Database

Closing a Plant

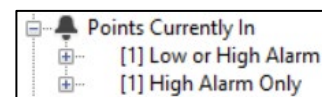
The user can close any Plants they have open in the hierarchy window by right-clicking them individually and selecting “Close Plant” from the menu.

Expand & Collapse Hierarchy

To make the DMS database more manageable, users can quickly navigate the hierarchy by expanding and collapsing specific areas. This can be done by right-clicking over the hierarchy level to be expanded or collapsed. Select “Expand All” or “Collapse All” from the menu. Everything under the hierarchy level selected will expand or collapse accordingly. This function can be performed at any level of the DMS hierarchy.

Points Currently In (Alarm)

Test Points within a Group that are in an alarm state will be placed in a separate area of the DMS hierarchy called “Points Currently In” and identified with a bell icon displayed next to it. Click on the (+) to open and view any test Points within the Group that have been identified as either in High or Low alarm status.



The “Points Currently In” area can be moved to the bottom of hierarchy or removed from it entirely. This is performed by right-clicking on the appropriate group and selecting “Display Alarms on Bottom” or “Hide Alarm Locations” from the menu. If the alarm locations are hidden, the Group name in the hierarchy will have an asterisk next to it.

Display Length Settings

If the user has a large collection of Historical Records for a given test Point, they can use this function to adjust how many records will be displayed. This is done by the user applying a customizable filter based upon the number of months they would like to see data from, starting with the most recent. When the filter is turned on, the database will update the test Point by hiding the older data. The records that are no longer displayed are only “hidden” from the DMS hierarchy, NOT deleted, and can be “unhidden” by turning the filter off.

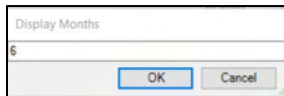
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The Display Length Settings can only be accessed at the test Point level by right-clicking it to open the hierarchy menu. A checkmark next to “Display Only Last # Months” indicates the filter is applied. The Display Length function is separated into two parts:



Set Display Length – This is used to set the specific number of months included in the filter.

Display Only Last # Months – This is used to toggle the filter on and off: the default is 6 months.



When “Set Display Length” is selected, a new window will open for the user to enter the number of months to be displayed. The “Display Only Last # Months” will be updated with the number that was entered.

Apply the new filter by selecting “Display Only Last # Months” from the hierarchy menu. A checkmark will appear next to it as well as an asterisk next to the Point name to identify that the filter is applied.

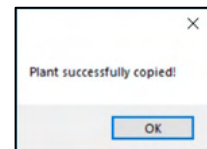
Note: This function is test Point specific. If the user wants to do this as a global Group function, they will need to use the “Group Cleanup” option.

Save a Copy of Plant

This function can be used to save a copy of an individual Plant that is open in the DMS hierarchy. The copy will contain all the data found in the original plant, including the images and sound files.

To save a copy of an open Plant, perform the following steps:

- 1) Right-click the Plant from the hierarchy window.
- 2) Select “Save Copy of Plant” from the menu.
- 3) Choose the location where the copy will be saved and press OK.
- 4) The user will receive a “Plant successfully copied!” prompt when the process is completed.



The folder name for the saved copy will include the original Plant name and the date/time stamp of when it was saved. The copy can be imported into another DMS 6 database or kept as a backup for the current one if needed.

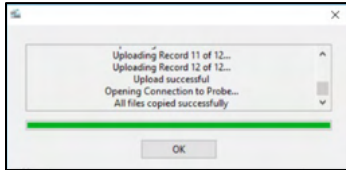
21. Transferring Data

The “Send Group” and “Retrieve Group” functions can be used to transfer data between the DMS database and the Ultraprobe in single group mode. Before any data can be transferred, the user must have a Group created in the DMS hierarchy. If there are no Locations or Points within the Group when data is downloaded, the DMS software will provide the new Historical Records with default names. Only one Group can be loaded to an Ultraprobe at a time for data collection.

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Note: Before data can be transferred the corresponding configuration for the Ultraprobe to be used must be created and/or selected by using the “Configure Probe” menu option below Communications.

Send Group to Probe

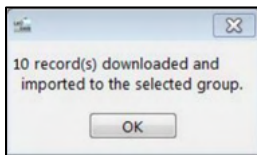


To upload a Group to an Ultraprobe 401, 9000, 10,000, 15,000 or 15,000B using “Single Group Mode”; perform the following steps:

- 1) Ensure the Ultraprobe is connected or the SD card to be used is inserted.
- 2) Right-click the Group from the DMS hierarchy.
- 3) Select “Send Group to Probe” from the menu.
- 4) The user will receive confirmation when the upload is complete.

Note: It is recommended to delete all files and folders from the SD card before uploading a new Group to Ultraprobe. Clear Instrument from the “Communications” menu should be performed by the user before collecting any new data with the Ultraprobe 3000 or 9000 only.

Retrieve Group from Probe

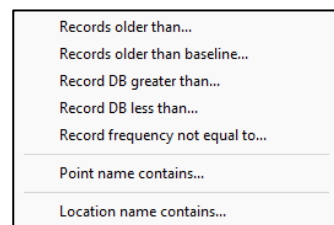


To download a Group from the Ultraprobe 401, 3000, 9000, 10,000, or 15,000 using “Single Group Mode”; perform the following steps:

- 1) Ensure the Ultraprobe is connected or the SD card to be used is inserted.
- 2) Right-click the Group from the DMS hierarchy.
- 3) Select “Retrieve Group from Probe” from the menu.
- 4) The user will receive confirmation when the download is complete.

22. Record Cleanup

This function allows the user to “Soft Delete” any unwanted Historical Records in the DMS hierarchy based upon the selected filter. There are several filter options to choose from and when selected it will be applied to all Records under the Plant, Group, Location, or Point selected. The items that were “Soft Deleted” can still be viewed by choosing Show Trash from the hierarchy menu.



To utilize the Record Cleanup function, perform the following steps:

- 1) Right-click on the Plant, Group, Location, or Point where the cleanup is to be performed.
- 2) Highlight/Select Record Cleanup from the hierarchy menu.

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- 3) To the right of the Record Cleanup option a new menu of filter options will be displayed; choose the filter to be used.
- 4) A new window for the filter chosen will open; enter the specific identifier that will be used for filtering.
- 5) Select OK when complete to apply the filter.

Note: The user will be able to return the Historical Records that were “Soft Deleted” back into the database by right-clicking Plant, Group, Location, or Point they are assigned to and then selecting Restore Deleted Items. They can also be permanently deleted the same way by selecting Empty Trash.

Records Older Than

DMS will delete the Historical Records that are older than the date the user chose to filter by.

Records Older Than Baseline

DMS will delete the Historical Records that are older than the current Baseline Record.

Record dB Greater Than

DMS will hide the Historical Records that are greater than the decibel the user chose to filter by.

Record dB Less Than

DMS will delete the Historical Records that are less than the decibel the user chose to filter by.

Record Frequency Not Equal To

DMS will delete the Historical Records that do not match the frequency the user chose to filter by.

Point Name Contains

DMS will delete the Points based upon the name or partial name the user chose to filter by.

Location Name Contains

DMS will delete the Locations based upon the name or partial name the user chose to filter by.

23.Synchronize Grease Fields

This option can be performed from the Group level of the DMS hierarchy. It organizes all the Baseline information for the lubrication related fields: Planned Strokes, Grease Type, Mass per Stroke, Grease Viscosity, Cost Per Mass, and Grease Gun Cal. Date.

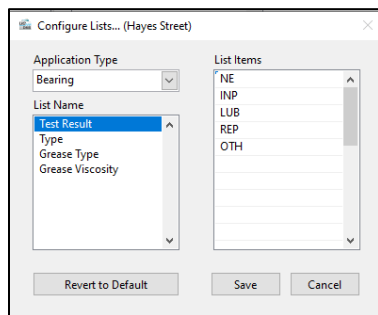
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Once established, the Baseline information for these fields will be readily viewable in the Historical Records of all current and future test Points for a specific Group.

To “Synchronize Grease Fields”, perform the following steps:

- 1) Establish readings for the following fields in the Baseline of each Point: Planned Strokes, Grease Type, Mass per Stroke, Grease Viscosity, Cost Per Mass, Grease Gun Cal. Date.
- 2) Right-click the Group name.
- 3) Select “Synchronize Grease Fields” from the hierarchy menu.
- 4) DMS will then update all Historical Records for all Points within that Group.

24. Configure Lists



These lists contain information related to describing details of a test for an Application. They can be uploaded to the Ultraprobe 10,000 and 15,000 to be used when entering test data in the field and can also be used as short-hand descriptions when entered into a Historical Record after a route has been downloaded to DMS. The list descriptions are preset in the software but can be changed or “configured”.

To configure lists, perform the following steps:

- 1) Right-click the Plant in the DMS hierarchy and select “Configure lists”.
- 2) Choose an Application Type from the drop-down menu provided.
- 3) Select the appropriate List Items to edit; this directly correlates with specific data fields found on the “Record Information” tab and available based upon the Application chosen.
- 4) The List Items area of the window will display items with (3) letters or less such as “NE” for no entry or “LUB” for lubricate.
- 5) Highlight the List Items to edit and make the needed changes by selecting up to 3 letters; add new items by selecting an empty line in the list and doing the same.
- 6) To return to the original list as it came from the factory, press the “Revert to Default” button.
- 7) Select OK when finished.

25. Update Baselines

This function allows new Baseline Records to be set for all Points in the selected Plant, Group, or Location.

Set Newest Records as Baselines
Set Oldest Records as Baselines

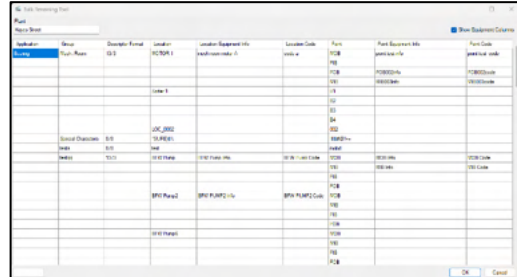
To utilize the “Update Baselines” function, perform the following steps:

- 1) Right-click on the Plant, Group, or Location where the Baseline Records are to be updated.
- 2) Select “Update Baselines” from the menu options.
- 3) Choose the option that will be used to determine the new Baseline Records.

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26. Bulk Renaming Tool

Changes to existing hierarchy names in DMS can be performed in bulk for an entire Plant using this tool.



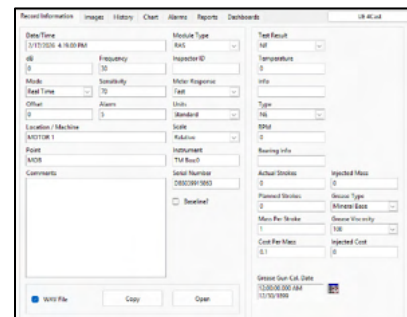
To utilize the “Bulk Renaming Tool”, perform the following steps:

- 1) Right-click on the Plant containing the hierarchy items to be renamed.
- 2) Select “Bulk Renaming Tool” from the menu options.
- 3) In the Bulk Renaming screen click on the cell with the hierarchy item that is to be changed. (Blank fields are associated with the last hierarchy item listed)
- 4) To change the change the Descriptor Format, click on the cell to be changed and select the other Descriptor Format available from the drop-down list. (If this causes any character limits to be exceeded, as displayed with a red “!”, then they will need to be corrected in the tool before the changes can be saved)
- 5) To make changes to Equipment Info and Code fields for Locations and Points, the box next to Show Equipment Columns must be checked first.
- 6) When completed press the “OK” button to accept the changes.

IV. Reviewing the Data

27. Record Information Tab

This tab contains the test information for data collected and downloaded from any Ultraprobe 401, 3000, 9000, 10,000, or 15,000 instruments. Most of the data fields can also be populated manually to allow for any potential editing that may be needed. Each table of information is linked to a specific Historical Record and therefore cannot be opened until that Historical Record located in the hierarchy has been selected.



The left side of the Record Information is for General Information that is included with all ultrasound applications. The right side is for any Application Specific Information; the applications include Bearing, Electrical, Generic, Leak, Steam, and Valve.

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General Information

The following information can be populated for all applications:

Date/Time – The date and time of data collection.

dB – Unit of measure for the intensity of sound.

Frequency – The frequency setting at time of collection.

Mode - The test mode used in the Ultraprobe: Real Time, Peak Hold, or Snapshot.

Sensitivity – The level of sensitivity selected at time of collection.

Offset – The dB minimum reference level set by the user at the time of collection.

Alarm – This can be set to a specific dB level to identify an unacceptable condition.

Location/Machine – The equipment identifier for the data collected.

Point – The specific point where data is collected.

Comments - Enter relevant comments in the box.

WAV File – Identifies if the Historical Record has a sound file attached. The sound file can be viewed in Spectralyzer with the “Open” button. The “Copy” button can be used to create a copy of the sound file in a folder location chosen by the user. The file will be renamed to include some Hierarchy and Record information. The copied sound file can be loaded into the UE One Analyzer for further analysis.

Record Path - To show where the record resides.

Module Type - The module used at time of inspection. The user can choose: SCM (Scanning Module), STM (Stethoscope Module), UWC (The Parabolic Dish) CFM (Close Focus Module), LRM (Long Range Module), FLEX (Flexible probes), RAS MT (Magnetic mount probe), RAS RAM (Remote Access Sensor/Remote Access Module) or OTH (Other).

Inspector ID – The alphanumeric designator used to identify the inspector that collected the data.

Meter Response - How the intensity & dB indicators move: Fast, Medium, or Slow.

Units - Standard or Metric.

Scale - Relative or Offset (refer to the Ultraprobe user’s manual for details).

Instrument - Enter the Ultraprobe used for this test.

Serial Number - enter the serial number of the instrument used for this test.

Baseline – Identifies this specific Historical Record as the baseline reading; this is also used for the high and low alarm delta.

Application Specific Information

The following information can only be populated for each specific application:

Bearing Application

Test Result – This data varies depending upon the application (The user can customize this list from “Configure Lists” in the File menu).

Temperature – A field for entering the location temperature at time of collection.

Info – Available field for additional information.

Type – Customizable list for entering type (This list can be customized from “Configure Lists” in the File menu).

RPM – The operating speed of the location.

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Bearing Info – Specific information about the bearing such as part number.

Actual Strokes – The actual number of grease strokes applied.

Planned Strokes – Total number of grease strokes that is planned.

Mass Per Stroke – Total amount of grease that comes out of grease gun on one stroke.

Cost Per Mass – Cost of grease per mass (i.e., grams).

Grease Gun Cal. Date - When grease gun was last measured for its output mass per stroke.

Injected Mass – Total amount of grease placed into the bearing housing (Actual Strokes x Mass Per Stroke).

Grease Type – Mineral Base, Synthetic & Polyurea. (The user can add other types of grease for this field from “Configure Lists” in the File menu).

Grease Viscosity – Type of viscosity used for that bearing “100, 150, 220, 460”. (The user can add more viscosities within the “Configure Lists” in the File menu).

Injected Cost - Total cost of grease being placed in that bearing (Cost Per Mass x Injected Mass).

Electrical Application

Test Result – This data varies depending upon the application (The user can customize this list from “Configure Lists” in the File menu).

Temperature – A field for entering the location temperature at time of collection.

Location – Customizable list for additional location information (This list can be customized from “Configure Lists” in the File menu).

Item Component – Customizable list for entering item component information (This list can be customized from “Configure Lists” in the File menu).

Voltage – Customizable list for entering voltage (This list can be customized from “Configure Lists” in the File menu).

Humidity – Field for entering the location humidity at time of collection.

Generic Application

Test Result – This data varies depending upon the application (The user can customize this list from “Configure Lists” in the File menu)

Temperature – A field for entering the location temperature at time of collection

Leak Application

Test Result – This data varies depending upon the application (The user can customize this list from “Configure Lists” in the File menu).

Pressure – A field for entering the location pressure at time of collection.

Application – Customizable list for entering application (This list can be customized from “Configure Lists” in the File menu).

Distance – Customizable list for entering distance (This list can be customized from “Configure Lists” in the File menu).

Steam Application

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Test Result – This data varies depending upon the application (The user can customize this list from “Configure Lists” in the File menu).

Manufacturer – Customizable list for entering manufacturer (This list can be customized from “Configure Lists” in the File menu).

Model – Customizable list for entering model (This list can be customized from “Configure Lists” in the File menu).

Application – Customizable list for entering application (This list can be customized from “Configure Lists” in the File menu).

Op Type – Customizable list for entering trap operating type (This list can be customized from “Configure Lists” in the File menu).

Pipe Size – Customizable list for entering pipe size (This list can be customized from “Configure Lists” in the File menu).

Orifice Size – Customizable list for entering orifice size (This list can be customized from “Configure Lists” in the File menu).

Inlet Temp. – A field for entering the inlet temperature at time of collection.

Outlet Temp. – A field for entering the outlet temperature at time of collection.

Valve Application

Test Result – This data varies depending upon the application (The user can customize this list from “Configure Lists” in the File menu).

Temperature – A field for entering the location temperature at time of collection.

Pressure – A field for entering the location pressure at time of collection.

Valve Type – Customizable list for entering valve type (This list can be customized from “Configure Lists” in the File menu).

Application – Customizable list for entering application (This list can be customized from “Configure Lists” in the File menu).

Pipe Size – A field for entering pipe size.

A – The dB level at test point A.

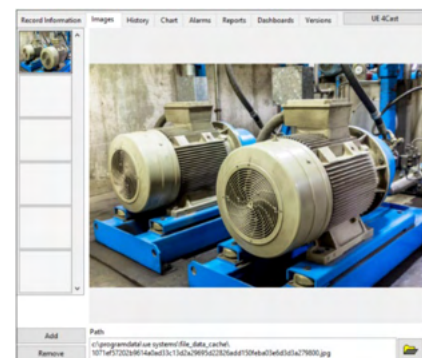
B – The dB level at test point B.

C – The dB level at test point C.

D – The dB level at test point D.

28.Images Tab

This tab can be used to attach images to various levels of the Ultratrend DMS database. Images can be added to any of the following hierarchy levels: Group, Location/Machine, Point, or Historical Record. Select the position in the DMS hierarchy and choose the Images tab to view what images are currently attached. There are two main functions in the Images tab, “Add” and “Remove”



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Adding an Image

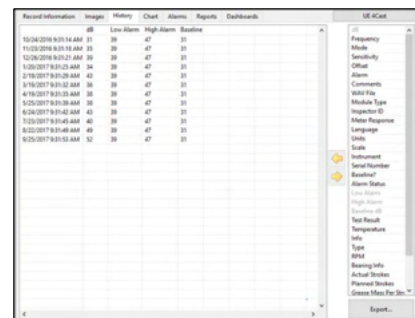
- 1) Select the position in the database hierarchy where an image is to be added.
- 2) Select the Images tab if it has not been previously selected.
- 3) Click the “Add” button in the bottom left of the Images Tab screen.
- 4) Locate the file path and select OK.

Removing an Image

- 1) Select the position in the database hierarchy where an image is to be removed.
- 2) Select the Images tab if it has not been previously selected.
- 3) Highlight/select the image to be removed.
- 4) Click the “Remove” button in the bottom left of the Images Tab screen.

29. History Tab

The History tab allows information from numerous Historical Records under a selected test Point in the hierarchy to be displayed together in spread sheet form. This information also determines what trend lines are created in the “Chart” tab. The number of Historical Records shown can be changed by entering the number of months to be displayed from the “Chart Tab”; please reference “IV. Reviewing the Data: 25.0. Chart Tab” section of this manual for additional information.



Using the Selector Box

To create the spread sheet in the History tab, perform the following steps:

- 1) Select the desired test Point in the DMS hierarchy.
- 2) Open the History tab if it is not already opened.
- 3) Using the Selector Box highlight the desired test information item.
- 4) Use the left arrow key to move it to the spread sheet.
- 5) Use the right arrow to return any column from the spread sheet to the Selector Box.

30. Chart Tab

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The Chart tab displays trend lines based upon the information selected in the “History” tab. The Y Axis displays the dB level while the X Axis shows the date. The user can customize the chart by adjusting the scale for both the X and Y Axis and by adding on chart remarks in the form of Annotations. Charts can be exported and saved in a variety of ways to allow for archiving and viewing later.



Note: The Chart function can only be accessed when selecting / highlighting a specific testing Point in the DMS hierarchy.

Adjusting the Chart Scale

X Axis – This scale can be adjusted by entering the number of months in the “Display Months” box; when finished press “Enter” or left-click on another area of the screen to apply. The change to the date range shown can be applied to all charts in the Group by pressing the “Apply to Group” button.

Y Axis – This scale can be adjusted by selecting the high and/or low values shown on the left side of the chart and entering a new value. The new values will determine the minimum and maximum dB values that will be shown in the chart.

Note: Both Axis can be set to “Auto Scale” from The Chart Options Menu (accessed by right clicking the Chart plot).

Chart Annotations

Text based Annotations can be created to identify areas of focus on the trend chart. Below are the chart options for creating and managing these Annotations:

Create Annotations – Allows the user to create an Annotation to the chart; accessed by right-clicking the Chart plot to open the Chart Options Menu

Delete All Annotations – Allows the user to delete all Annotations on the chart; accessed by right-clicking the Chart plot to open the Chart Options Menu.

Edit Annotations (Menu) – When right-clicking an Annotation, a menu will appear to edit the attributes such as color, line/pointer style, and line width. The “Snap To” feature can be accessed from here to allow an Annotation to be automatically attached to a specific trend marker in the chart. This is also where the user can delete a specific annotation if needed.

Saving a Chart

Export – Attaches a copy of the chart to the “Point” in the hierarchy.

Save – Will save the chart as a JPEG file.

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Print – The user can print the chart as an HTML file in the web browser or save it as a PDF document.

31. Alarms Tab

This tab can be used to establish dB-based Alarm levels for each Point in a Group. The user has the option to set both a High- and Low-level Alarm. To use the Alarms tab, a Historical Record must be selected in the hierarchy. Historical Records that break established Low Alarms will be highlighted yellow in the hierarchy and those that break High Alarms will be highlighted red.

The screenshot shows the 'Alarms' tab in the Ultratrend DMS 6 interface. It features two main sections for configuring alarm levels. The top section includes input fields for 'High Alarm Level' (set to 47) and 'Low Alarm Level' (set to 39), accompanied by a button labeled 'Update All Alarm Levels using values'. The bottom section includes input fields for 'High Alarm Delta' (set to 0) and 'Low Alarm Delta' (set to 0), accompanied by a button labeled 'Update All Alarm Levels using deltas'. At the bottom of the interface, there is a 'Record Information' box displaying '31 dB', 'ok Alarm State', and a green bar labeled 'Baseline?'.

When the Alarms tab is open, there are two choices: “Update All Alarm Levels Using Values” or “Update All Alarm Levels Using Deltas”.

Setting Alarm Levels

When setting the Alarm levels there are two options: “Update All Alarm Levels Using Values” or “Update All Alarm Levels Using Deltas”. When one of these options is selected it will apply those Alarm settings to all current and future Historical Records for each Point in that Group hierarchy.

Note: The default Alarm setting is a value of 122 dB for both the High and Low Alarm Level until a new Alarm level is entered and established.

Update All Alarm Levels Using Values – To set the Alarm Levels to a defined value, enter those values in the High and Low Alarm Level fields, then press the “Update All Alarm Levels Using Values” button next to them to apply.

Update All Alarm Levels Using Deltas – This can be used to determine the High and Low Alarm Levels as a rise over established Baseline Historical Recordings. Enter the High and Low Alarm Delta, then press the “Update All Alarm Levels Using Deltas” button next to them to apply. The new Alarm Levels will equal the Alarm Delta value entered plus the Baseline dB of each Point.

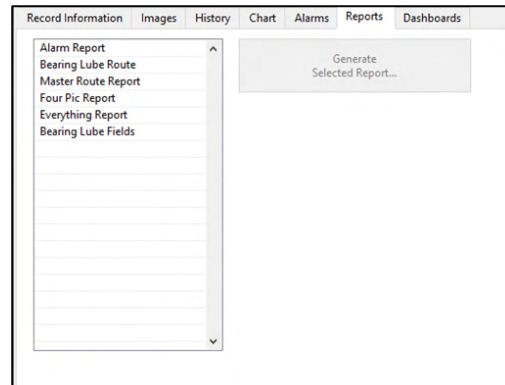
Alarm State Info

The record information of the specific Historical Record selected will be displayed in the box at the bottom of the Alarms tab labeled “Record Information”. This area will also identify if it is a Baseline Historical Record and if it is or is not breaking the established Alarms.

32. Reports Tab

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The Reports tab offers additional capabilities for reviewing and data mining the information collected and entered the DMS 6 database. This is done by providing numerous report templates based upon Application type that can be generated for any Group in the DMS database hierarchy.



Creating Reports

To generate a report, perform the following steps:

- 1) Select the specific Group in the DMS hierarchy that contains the information to be included.
- 2) Open the Report tab if it is not already opened.
- 3) Choose from the available reports on the Report Template List to the left of the “Generate Selected Reports” button.
- 4) Press the “Generate Selected Report” button.
- 5) Choose a file path where the report will be saved, name the file, and press the OK button to complete.
- 6) A notification window will inform the user when the report has been saved successfully, locate, and open the file to review.

Available Report Templates

There are six distinct types of Applications that can be found in the DMS 6 database hierarchy. Each of these Applications determines the type of reports that can be generated from the Reports tab. The following is a brief description of each of the Report Templates:

Alarm Report

This report will only show test Points within a highlighted Group in the DMS hierarchy that exceeded established alarms during their most recent Historical Recordings. Some of the information included in this report is: hierarchy location info, date, sensitivity, frequency, dB Level, and alarm status information.

The following applications can generate this report: Bearing / Electrical / Generic / Leak / Steam / Valve

Bearing Lube Report

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This report will only show test Points within a highlighted Group in the DMS hierarchy that exceeded established alarms during their most recent Historical Recordings. It includes all the information found in the “Alarm Report” with the addition of the type of lube and if it was lubed data fields.

The following applications can generate this report: Bearing

Master Route Report

This report would show all test Points within a highlighted Group in the DMS hierarchy based upon their most recent Historical Recordings, no matter if they broke the established alarms or not. Some of the information included in this report is: hierarchy location info, alarm status information, and any comments that were entered for that record.

The following applications can generate this report: Bearing / Generic

Everything Report

This report will include all data entered in DMS for every Point within a highlighted Group in the DMS hierarchy. This includes all Historical Recordings to date and every data field for all Applications.

The following applications can generate this report: Bearing / Electrical / Generic / Leak / Steam / Valve

Bearing Lube Fields

This report will show the Historical Recordings for all test Points within a highlighted Group in the DMS hierarchy based upon the month selected when generating the report. It includes all the information found on the “Bearing Lube Report” with the added fields for performing a lubrication cost analysis. This report is customizable including only the data fields that were selected by the user while creating the report.

The following applications can generate this report: Bearing

Two Pic Report

This report can be used to communicate leak survey findings by generating two individual records per page with one image per record. It will select the first image in the Historical Record from each Point within DMS to populate in the report. This report also includes data fields that can be manually entered by the end-user to track repair completion for the leaks identified during the survey: fields such as Leak Repaired status, Date, and Initials.

The following applications can generate this report: Leak

Four Pic Report

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This report can be used to communicate defects based upon ultrasound findings that can include up to four images and sound files for a test Point within a highlighted Group in the DMS hierarchy. The user can choose which sound files and images to include in the report from a Historical Record by selecting that location from the report menu hierarchy on the left and then using the drop-down menus under the ones that are shown as available options. This report also includes data fields that can be manually entered by the end-user to track repair completion for the identified defects: such as Suggested Corrective Action, Repair Date, Repairs Performed, and Repaired By.

The following applications can generate this report: Bearing / Electrical

Mixed Compressed Gas Report

This report displays data from a leak survey; it can be used for any gas. The default gas selections in the sheet are: Compressed Air, Argon, Helium, Hydrogen, and Other. It will compute the cost of the leak and the impact on the plant's Carbon Footprint. The user may adjust the local carbon gas emissions in the coefficient located on the bottom of the Compressed Gas report sheet.

There are tabs on the bottom of the spread sheet which will guide the user to: Cost, Report (annualized updated report), Month (Monthly results), Master (this blank sheet is only used to facilitate importing of data and does not need to be used), Flow Rate Chart (for setting the CFM "Guesstimate"), and a Coefficient Table to select the greenhouse gas results by the state/area where the test was performed. It will report on the savings per month and globally update the Report Sheet to review the results on an annualized basis.

The following applications can generate this report: Leak

Compressed Air Report

This report is identical to the "Mixed Compressed Gas Report" except it does not include any of the specialty gases.

The following applications can generate this report: Leak

Leak Survey Report

Similar to the "Mixed Compressed Gas Report" that also includes a dashboard for better visualization of cost savings and the overall performance of your energy conservation program.

The following applications can generate this report: Leak

Steam Report

This report details the steam trap survey results and the steam trap condition for the most recent Historical Recordings for all the test Points in the Group. It includes all the pertinent data fields for

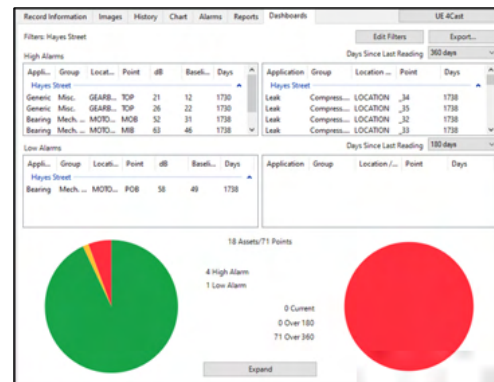
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determining additional steam costs due to defective conditions identified. This report is customizable, including only the data fields that the user selects when creating the report.

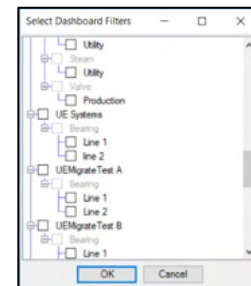
The following applications can generate this report: Steam

33. Dashboards Tab

The Dashboards tab can be used to provide an overview of the alarming and collection status of test Points for multiple Plants and Groups from the DMS hierarchy. The pie charts at the bottom of the Dashboard provide a visual component to view the data that can also be expanded to make it easier to read.



To determine the test Points that will be shown in the Dashboard, press the “Edit Filters” button and enter a check in the boxes next to the Plants and/or Groups that will be included. When the selections have been made, press OK to apply the filter changes to the Dashboard. The filters that are currently applied can be seen in the top left area of the Dashboard.



The information displayed on the Dashboard is separated into two sides, one based upon “High & Low Alarms” and the other on “Days Since Last Reading”. below is a detailed description for both:

High & Low Alarms

The left side of the Dashboard screen includes information for each test Point that is in an Alarm State from the Plants and Groups selected in the filter. The upper portion shows the information for the test Points in High Alarm and the one below it shows those that are in Low Alarm. A pie chart can be found at the bottom of the Dashboard that visually depicts the overall Alarm State of all test Points from the Plants and Groups the user has selected. In the pie chart: Green = No Alarm, Yellow = Low Alarm, Red = High Alarm.

Days Since Last Reading

The right side of the Dashboard screen includes information based upon the last day data collected for each test Point from the Plants and Groups selected in the filter. It comes in two portions that the user can customize by selecting the number of days next to “Days Since Last Reading”. The choices range from 7 to 1,080 with one consideration; the upper portion must have a higher number of days than the lower portion. The upper portion will also take precedence over the lower portion during the filtering

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process, ensuring anything included in the upper portion will not be duplicated in the bottom portion. A pie chart can be found at the bottom of the Dashboard that visually depicts the overall number of days from each portion customized by the user. In the pie chart: Green = Points that were Current (or below the number of days selected in the bottom portion), Yellow = Points that exceed the number of days in the bottom portion, and Red = Points that exceed the number of days in the top portion.

Export

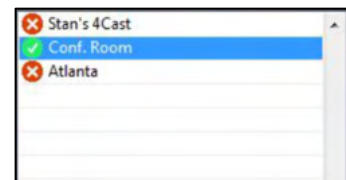
It can be used to export the Dashboard into a spreadsheet format. It will give the breakdown of “high”, “low” alarms along with “Days Since Last Readings”

V. Configuring the 4Cast System

34.Introducing the 4Cast Manager

Once the 4Cast is connected to the computer that will be retrieving the data, the user can configure it with the 4Cast Manager by pressing the “UE 4Cast” button in the upper-right corner of the DMS 6 software.

When the 4Cast Manager opens, a list of 4Casts connected to the computer will be seen on the left. A “green circle with a checkmark” next to a 4Cast indicates it is connected and operating properly. A “red circle with a x” indicates it was once connected, but it is currently experiencing connection or operation issues.



To perform any modifications in the 4Cast manager, the user will need to press the “Start Editing” button in the upper-right corner.

35.UE 4Cast Configuration Tab

The Configuration tab of the 4Cast Manager can be used to view specific information unique to each 4Cast such as their UUID and IP Address. The user can also use the tab to add and remove images, update the 4Cast firmware and change how long a 4Cast will archive data.



Data Archiving Settings

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Name – The user can enter a specific name for the 4Cast in this field.

Keep Readings For # Days – This is for the number of days an individual 4Cast will archive the dB only readings before it will begin writing over the old data.

Keep Readings and WAVs For # Days – The is for the number of days an individual 4Cast will archive the readings with WAV files before it will begin writing over the old data.

Set – This button is used to save any changes made to the Data Archiving Settings.

4Cast Info Section

UUID – The Universal Unique ID for the 4Cast.

IP Address – The address for that specific 4Cast.

Current Firmware Version – The version of firmware installed on the 4Cast.

Update Firmware - If there is an update for the 4Cast, this button can be used to update it.

Reset - This button can be used to reset the individual 4Cast.

Note: Resetting the 4Cast will NOT delete settings that had been previously entered.

Add / Remove Images

Add – The user can link an image to the 4Cast by selecting this button and then choosing the file location.

Remove - To remove a link to an image associated with that 4Cast, highlight that image, and then select the “Remove” button.

36.UE 4Casts Points Tab

With this tab the user can link the 4Cast to an existing DMS database where data will be downloaded and stored. This tab also provides the user with multiple options to manually request the immediate downloading of data from the 4Cast to the DMS database.

The screenshot shows a web interface for configuring 4Cast points. It features four columns for Sensor 1, Sensor 2, Sensor 3, and Sensor 4. Each column has dropdown menus for Plant, Application, Storage, Machine, and Point. Below these are buttons for 'Get Readings Now' and 'Get Readings with WAVs Now'. At the bottom, there is a 'Archive Readings' section with a table showing 'Sensor', 'Start', 'End', and 'Get Readings Between Dates' buttons. The table contains two rows of data for Sensor 1 and Sensor 2.

Sensor	Start	End	Get Readings Between Dates
1	1/1/2017	1/1/2017 12:00:00 PM	
2	1/1/2017	1/1/2017 12:00:00 PM	

DMS Hierarchy Links

The dropdown fields can be used to map the 4Cast sensors to the DMS hierarchy. For this to work, the corresponding hierarchy must already be created in the DMS database. The user can select from the Plant to Point level with the dropdown lists based upon the available options from the DMS hierarchy. Once the options have been selected, press the “Set All” button to save the changes.

Get Readings & Get Readings with WAVs Now

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Get Readings Now – With this button, the user can download an immediate dB only reading from a single sensor and send that to the DMS database. This is normally done to establish an initial Baseline Record for that Point in the database. Each sensor has this feature and if the user wants to capture dB readings for all four sensors, they can select the first button on the far left. The first button is for a global retrieval of a dB only reading for all four sensors.

Get Readings with WAVs Now – This is the same as “Get Readings Now”, except the user will also receive a WAV file with a dB reading when it is collected. The first button on the left labeled, “Get Readings with WAVs Now”, is for a global retrieval of a dB reading with WAV file for all four sensors.

Archive Access

The user will be able to download dB readings and WAV files from a certain date and time range based upon the parameter information entered below. After the parameter information has been entered, the user can select either “Get Readings Between Dates” or “Get Readings with WAVs Between Dates” to start the download.

Sensor – This is used to identify which 4Cast sensor the data is to be downloaded from.

Start – The user can enter the Start Date & Time for the data to be downloaded.

End – The user can enter the End Date & Time for the data to be downloaded.

MAX – The user can choose the number of Readings / WAV files to be downloaded.

With the given parameters, the 4Cast will then be able to download the data from its internal storage and send that information to DMS to be stored.

37. Sensor Setup Tab

The Sensor Setup tab can be used to make any necessary adjustments to ensure the sensors connected to the 4Cast are collecting quality ultrasound readings and sound files. If the adjustments are correct, the 4Cast will always receive quality data, even if the sensor is in an alarm state.

The screenshot displays the 'Sensor Setup' interface for four sensors. Each sensor has a set of controls including a 'Sensor Signal Level' (0% to 100%), a 'Sensor Reading' (0 to 100), a 'Sensor Reading Frequency' (0 to 100), and a 'Sensor Reading Offset' (0.00 to 0.00). There are also 'Alarm State' buttons (On/Off) and 'Alarm Delay' (0 to 100) for each sensor. At the bottom, there are 'Auto Sensitivity' checkboxes and 'Auto Sensitivity High Trigger Level' (0% to 100%) and 'Auto Sensitivity Low Trigger Level' (0% to 100%) settings. A 'Sensitivity' section at the bottom has a 'Sensitivity' (0 to 100) and a 'Sensitivity' (0 to 100) slider. The interface is organized into a grid with columns for each sensor and rows for each setting.

Live Mode Toggle

This will allow the user to turn on Live Mode when needed to actively view the current dB output of each sensor. Each sensor can be toggled in and out of Live Mode individually with a Start / Stop button located at the bottom of the “Sensor Setup Tab”. This can be especially useful when setting up sensors initially, to ensure the Sensor Settings are properly adjusted.

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Sensor Settings

Any Sensor Setting changes can be permanently saved by pressing the “Set” button at the bottom of the sensor from where those changes were made. This can also be done for all sensors at one time by pressing the “Set All” button to the left of the “Set” button for the individual sensors.

Sensor Signal Level – This is the intensity of the signal going through the sensor. This is important when it comes to recording quality sound to analyze through the UE Spectralyzer software. The optimum intensity level is typically considered to be around 25%. The user can adjust the intensity through the Sensitivity or Auto Sensitivity settings.

Sensor Reading – This is the measure of sound that the sensor is reading shown as a dB value. If the user sees (>>) instead of a dB value, it means that the sensor is under-range, and that the sensitivity needs to be increased. If the value is (<<), it means that the sensor is over-range, and the sensitivity needs to decrease.

Sensor Reading Averaging – This is the number of averages per second that the sensor will take when data is collected. This can help smooth out the dB value by averaging out transient events that may be causing the data to appear chaotic and difficult to use in some scenarios. The user will be able to select the number of averages up to a maximum of 20 samples per second.

Sensor Reading Offset - If the 4Cast is going to be taking readings on an existing route that an Ultraprobe was taking readings from in the past, the user can use an offset to adjust for the dB difference as needed. This will ensure that the readings stay consistent between both data collection methods.

Alarm State – This provides indication of a sensor that is exceeding the established Alarm Level; “red” circle indicates it is in alarm, and a “blue” circle indicates it is not.

Alarm Level - Once the dB is established, the user can set a dB value for the Alarm level on that sensor. If the sensor has a dB value higher than the Alarm Level dB, it will trigger the 4Cast to start recording the dB value and sound file, so it can be sent to DMS.

Alarm Delay – This setting can be adjusted up to a maximum of 60 seconds and it will start from when the sensor hits the established Alarm Level. Once the adjusted time is exceeded, and if the sensor is still in alarm, it will trigger the 4Cast to start taking a reading for that sensor. If the dB level falls below the Alarm Level after time has exceeded, no reading will be taken to mitigate unwanted data being uploaded to the DMS database.

Alarm Release - When a sensor constantly goes in and out of an Alarm State, the Alarm Release can be used to establish a lower dB value to determine when that sensor leaves alarm. Enter the dB value to be subtracted from the Alarm Level, up to a maximum of 9 dB, to determine what dB value the sensor must fall below before it is no longer considered to be in alarm.

Auto Sensitivity – This represents the percentage of scale for the Sensor Signal Level of each sensor. By checking or unchecking the box, the user can enable or disable the High and Low Trigger Levels.

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When enabled, this can be used to automatically adjust Sensitivity based upon specific Sensor Signal Level positions established by the user.

Auto Sensitivity High/Low Trigger Level - Based upon a percentage scale from (0-100%), the user can establish Trigger Levels for the Sensitivity to be automatically adjusted. The 4Cast will automatically reduce the Sensitivity until the Sensor Signal Level is within the High & Low Trigger Levels.

Sensitivity - Used to adjust the intensity of sound that comes through the sensor. This can manually and will help with under and over-ranged conditions.

38. Reading Schedule Tab

The Reading Schedule Tab can be used to configure the automatic collection of dB only readings by the 4Cast. It can also be used to determine when the data stored in the 4Cast is sent to the DMS database. There are numerous Scheduling Options available to customize the 4Cast's data acquisition process.

The screenshot shows a configuration table for four sensors (Sensor 1, Sensor 2, Sensor 3, Sensor 4). The table has the following rows and columns:

	Sensor 1	Sensor 2	Sensor 3	Sensor 4
Storage Interval	5 minutes	5 minutes	5 minutes	5 minutes
Send to DMS Interval	5 minutes	5 minutes	5 minutes	5 minutes
Storage Interval When in Alarm	5 minutes	5 minutes	5 minutes	5 minutes
Readings Before Alarm to send to	15	15	15	15
Readings During Alarm to send to	5	5	5	5
Readings After Alarm to send to DMS	15	15	15	15
Trigger on dB Level	148	148	148	148
Delay Start Up	5 s	5 s	5 s	5 s
Apply to All Apply to All Apply to All Apply to All				
Set All Set Set Set Set				

Apply to All – After a sensor has been configured, press the “Apply to All” button under that sensor to copy that configuration to the other sensors.

Scheduling Options

Any Scheduling Options changed can be permanently saved by pressing the “Set” button at the bottom of the sensor from where those changes were made. This can also be done for all sensors at one time by pressing the “Set All” button to the left of the “Set” button for the individual sensors.

Storage Interval – How often a sensor will take readings and store them internally in the 4Cast. The interval can be expressed in minutes, hours, days, or weeks.

Send-to-DMS Intervals – How often data will be sent from the 4Cast to the DMS 6 database. The interval can be expressed in minutes, hours, days, or weeks.

Storage Interval When in Alarm – How often a reading will be collected with the 4Cast once a sensor goes into alarm. The interval can be expressed in minutes, hours, days, or weeks.

Readings Before\During\After Alarm to send to DMS - The number of readings the 4Cast will send to the DMS database when a sensor goes into alarm.

Trigger on dB Level - The dB value that must be exceeded before a scheduled reading will be taken.

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Delay Start up – This option works in conjunction with Trigger on dB Level and allows for a time delay of up to 60 seconds to be added before a scheduled reading is taken after the trigger is exceeded.

39. WAVs Schedule Tab

The WAVs Schedule Tab can be used to configure the automatic collection of a WAV file by the 4Cast. It can also be used to determine when the data stored in the 4Cast is sent to the DMS database. There are numerous Scheduling Options available to customize the 4Cast's data acquisition process.

The screenshot shows a configuration table for four sensors (Sensor 1, Sensor 2, Sensor 3, Sensor 4). Each sensor has a set of input fields for various scheduling parameters. The parameters include: WAV Storage Interval, WAV Send-to-DMS Interval, WAV Storage Interval When in Alarm, WAVs Before Alarm to send to DMS, WAVs During Alarm to send to DMS, WAVs After Alarm to send to DMS, WAV Record Time (s), WAV Record Time in Alarm (s), and WAV Record Time for Manual (s). Each field has a dropdown menu for units (minutes, hours, days, weeks) and a numeric input field. At the bottom of each sensor's column is an 'Apply to All' button. At the very bottom of the table is a 'Set All' button.

Apply to All – After a sensor has been configured, press the “Apply to All” button under that sensor to copy that configuration to the other sensors.

Scheduling Options

Any Scheduling Options changed can be permanently saved by pressing the “Set” button at the bottom of the sensor from where those changes were made. This can also be done for all sensors at one time by pressing the “Set All” button.

WAV Storage Interval - How often a sensor will take WAV files and store them internally in the 4Cast. The interval can be expressed in minutes, hours, days, or weeks.

WAV Send-to-DMS Interval - How often WAV files will be sent from the 4Cast to the DMS 6 database. The interval can be expressed in minutes, hours, days, or weeks.

WAV Storage Interval When in Alarm - How often a WAV file will be collected with the 4Cast once a sensor goes into alarm. The interval can be expressed in minutes, hours, days, or weeks.

WAVs Before\During\After Alarm to send to DMS - The number of WAV files the 4Cast will send to the DMS database when a sensor goes into alarm.

WAV Record Time (s) Normal\Alarm\Manual - The recording time for WAV files during normal, alarm, and manual collections (0-60 seconds).

Note: It is strongly advised not to take sound recordings with the 4Cast at 10 minute or below intervals.