

# DoseControl Software User Guide

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# 1 Introduction

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DoseControl Dosimetry System is an automatic, software-controlled dosimeter measurement system used for radiochromic film and PMMA dosimetry. The system has specialized holders for B3 dosimeters (B3 WINDose and B3 DoseStix), FWT-60 dosimeters, CTA dosimeters, and Harwell PMMA dosimeters.

The DoseControl System is used in industrial routine dosimetry applications such as medical device sterilization, pharmaceutical manufacturing, and the curing of inks and coatings. DoseControl software is 21 CFR part 11 compliant and meets the requirements of published guidance for the irradiation processing industry, specifically the medical device sterilization industry.

The DoseControl Dosimetry System is a complete, off-the-shelf dosimetry system. The DoseControl software is connected to one of the following spectrophotometers:

- Thermo GENESYS 20 spectrophotometer
- Thermo GENESYS 30 spectrophotometer
- Thermo Evolution spectrophotometer

## General Features

- All dosimeter measurement information and related metadata is captured and permanently recorded by the DoseControl software.
- The software ensures a valid calibration is used for the calculation of dose from dosimeter response.
- The application Administrator can control the dosimetry workflow for each user within the DoseControl software:
  - User access, roles, and permissions
  - Dosimeter measurement workflow, including re-measurements
  - Spectrophotometer actions and performance verification

## Dosimetry Report Management

Dosimetry measurement information is contained in Dosimetry Reports; reports are managed through a versioning system.

- *Create New Report*: Select “New Report” and choose from a drop-down menu of pre-configured report types.
- *Report Summary screen*: Review overall report information, measurement results, any process results (min/max, measurements outside the range), comments, and more. Review before processing a report.
- *Process Report*: Final report is complete; the user selects “Process Report” to save this version of the report (example: ReportName version 1). Process reports are shown in green in the Report List main screen.
- *Version Report*: User can create versions of an existing report that has been processed (example: ReportName version 1 → ReportName version 2).

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## Software Outputs

### Dosimetry Reports

DoseControl outputs secure PDF reports and Microsoft Excel reports. Customize these reports with customer and process information, or use a standard template for routine dosimetry, reference dose dosimetry, E-beam testing, dose mapping, and dosimeter batch calibrations.

### Audit Trail Reports

DoseControl software permanently records all events and creates an audit trail that is available to save or print as a secure PDF report. Within the software, the user can filter the audit trail as needed and create a report with the relevant historical events. The user can save and print audit reports. (See Audit Trail and Audit Reports section)

### Performance Verification Reports (Evolution spectrophotometer only)

Save and print performance verification summary reports for wavelength and photometric accuracy of the Evolution spectrophotometer.



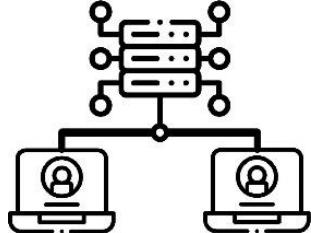
### Export data to integrated system (Enterprise license)

Export any data from DoseControl, including any information recorded related to the dosimeter measurement, process parameters, product specific information, and more. See Integration with Other Systems.

## Data storage

DoseControl uses Microsoft SQL Server as the database for storing application data. SQL Server is licensed to companies in many ways and you will be responsible for determining and managing your licensing if you choose to use SQL with DoseControl. GEX does not sell or license SQL nor is it versed in the myriad of licensing options offered by Microsoft.

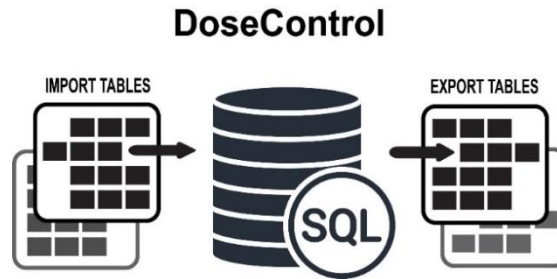
Depending on the DoseControl license type, the DoseControl dosimetry system can store data in the following structures:

Basic License	Premier License	Enterprise License
		
Dosimetry software installed on Windows PC. Data stored on PC, using MS SQL Server Express database.	Dosimetry software installed on one or more PC's and connected to a single SQL Server. Data stored in SQL Server database.	Same as Premier - plus integration capabilities with other systems.

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## Integration with Other Systems (Enterprise License only)

DoseControl software has a built-in structure to simplify and minimize costs to integrate with other systems (such as SPC, QMS).



- Import process and product data into DoseControl software.
- Export process, product, and dosimeter measurement data from the DoseControl software.

Use a database professional within your own organization to integrate with the DoseControl software's import or export tables. Push data into the SQL import tables; and pull data from the SQL export tables. No custom software development is needed.

### Some examples:

- Import information about the irradiation process and dosimetry for that process to make it easy for the operator to simply click and open the imported dosimetry report and begin measurements. Reduces input errors.
  - Dosimeter ID's that were included in the irradiation process run.
  - Min and max dose specifications and correlation ratios
  - Process-specific information such as: Catalog Number, Product Description, etc.
- Export dosimetry information for product release processes, process control, process data analysis, and the analysis of dosimetry related metrics.

Talk to GEX Customer Service or refer to *GEX Doc # 100-268, User Guide for Integration with DoseControl* for complete details about integrating DoseControl with other systems, and a description of DoseControl software's import and export table fields.

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## 2 Platform Requirements

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### DoseControl uses Microsoft SQL for storing almost all application data.

- For many DoseControl users with a Basic License, an ideal option is to use Microsoft SQL Express, which is a lightweight version of MS SQL with a 10GB limit on database size. You can setup MS SQL Express easily by following the instructions in [Appendix 1: Installation & Setup of Microsoft SQL Server Express \(for Basic License\)](#).
- For more information about SQL Server editions, please see the Microsoft website <https://docs.microsoft.com/en-us/sql/sql-server/editions-and-components-of-sql-server-2016?view=sql-server-ver15SQL>

### PC Workstation Requirements:

#### Optimal Requirements for PC Workstations:

- Windows 10 x64
- .NET Framework 4.6.2
- 16 GB RAM
- 8th Gen Intel i7 Quad Core processor equivalent or higher
- At least 100 GB hard drive space
- 1900 x 1200 screen resolution or higher capable widescreen monitor
- Adobe Reader
- Microsoft Excel 365 desktop version

#### Minimum Requirements for PC Workstations:

- Windows 10 x64 or higher
- .NET Framework 4.6.2
- 4 GB RAM or higher
- 6th Gen Intel i5 Quad Core processor equivalent or higher
- 20 GB hard disk space
- Adobe Reader
- Microsoft Excel 2014 or higher desktop version

### Database Server Requirements:

#### Optimal Requirements for Application Database Servers:

- Microsoft Windows server 2016 or higher
- At least 100 GB hard drive space
- At least 16 GB RAM
- Microsoft SQL Server 2017 or higher

#### Minimum Requirements for Application Database Servers:

- Microsoft SQL Server 2014 SP3\* or higher
- Microsoft Windows server 2012 R2 or higher

\* GEX supports Microsoft Windows Server and SQL Server versions that have not expired per Microsoft's documented end of support dates. This does not include products with Extended Security Updates (ESUs). See <https://docs.microsoft.com/en-us/lifecycle/announcements/sql-server-2012-windows-server-2012-end-of-support> for more information.

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## 3 DoseControl Software Installation

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### Pre-Installation

Please complete the following items before installing DoseControl:

**Log on with an Administrator Account**

You will need to log on to the computer where DoseControl is being installed with an account that has administrative privileges.

**Install and/or Configure SQL Server**

DoseControl software uses Microsoft SQL Server. The GEX application connects to a SQL database to save and edit all system configuration parameters and dosimetry measurement information. Microsoft offers several licenses for its SQL Server technology and DoseControl can connect to either a lightweight version installed directly on a laptop or PC, or to a larger scale SQL Server setup on a network or in the cloud. DoseControl software requires a SQL Server database setup prior to the software installation.

- Premier/Enterprise License - Contact your IT or technical support to set up the SQL Server (see Platform Requirements above).
- Basic License: The basic setup requires MS SQL Server Express installed on the same PC workstation on which you will install DoseControl. Installing MS SQL Server Express takes only a few minutes. **You must successfully complete all the steps in [APPENDIX 1: Installation & Setup of Microsoft SQL Server Express](#). This will provide you the connection string required in the next task.**

**Create a connection string**

**Premier/Enterprise license installations:** For more complex, corporate installations of SQL Server, you will need assistance from your IT/Technical Support to help you configure SQL and provide the information necessary to construct the Master Connection String for the DoseControl installation.

**Basic license installations with MS SQL Server Express:** You will have created your Master Connection String by completing the steps in [APPENDIX 1](#).

### First Time Installation of Software

GEX will send you a DoseControl Software installation package, which is a folder that contains everything you will need. There is the main application, plus a list of modules (\*.dll files). The modules are specific to your application install. You can add new modules to DoseControl if needed in the future (example: if you purchase a new Product Specifications module).

**IMPORTANT**

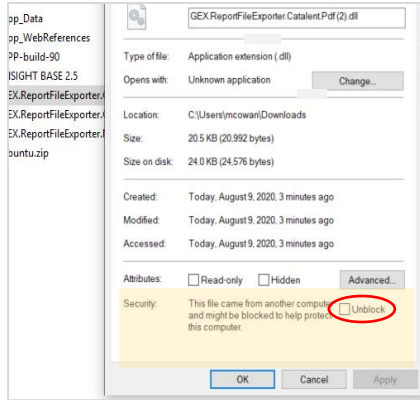
You will need administrator privileges for your PC on your network to install GEX DoseControl software, or you will need your IT personnel with admin privileges to install the software for you.

**IMPORTANT**

Some companies may have network security in place to control externally-sourced and sensitive files like \*.msi and \*.dll's, files types that are necessary for the installation of GEX software. Ask your IT personnel for more information. Also, sometimes Microsoft Windows operating systems will 'block' \*.dll files as security protection. To 'unblock' the \*.dll files included with the GEX software installation files, right click on each \*.dll file and select 'Properties'. If the file is blocked, click the 'unblock' checkbox to remove the security block.

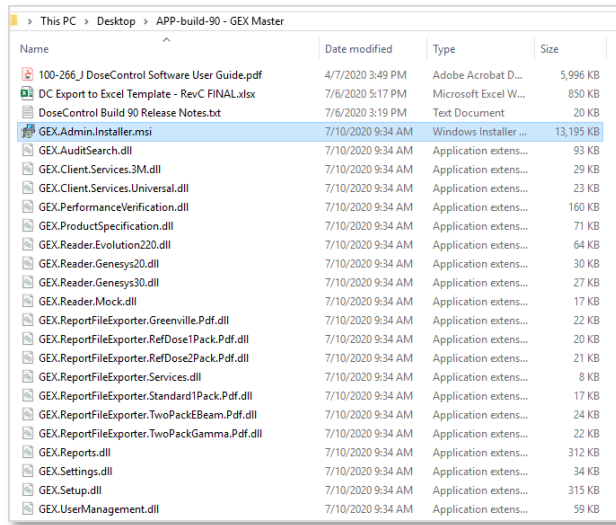
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**Files included in your GEX DoseControl install folder:**

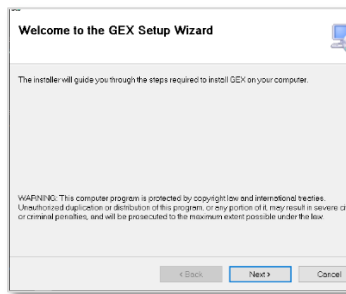
- \*.msi file: Installer
- \*.dll files: Modules
- MS Excel file: Default dosimetry report
- Release notes, User Guide



Screenshot of GEX installation files

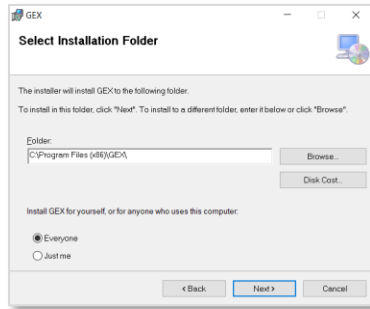
**Installation Instructions**

- 1 Place the .msi installer on the desktop of the computer for installation.
- 2 Double-click .msi. Follow prompts to complete the install of the application.

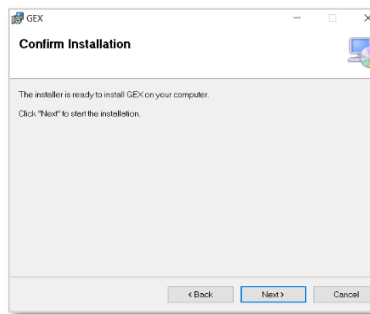


- 3 Select the folder to install the application to on the computer.

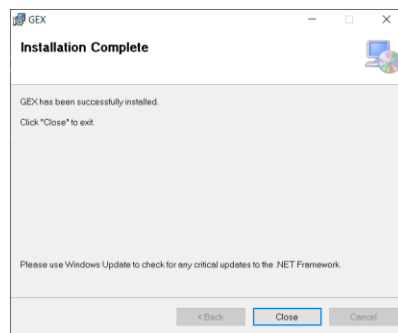
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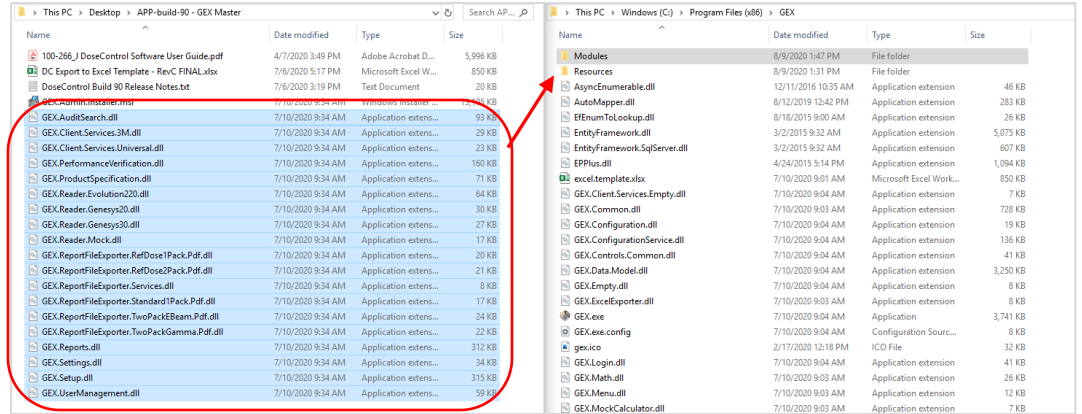
- 4 Confirm the installation. Click “Next”:



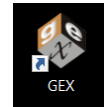
- 5 Verify that the installation completes – you should see this message below:



- 6 Remove any security blocks on the module files (\*.dll files). Sometimes Microsoft Windows operating systems will block \*.dll files as security protection. To “unblock” the \*.dll files included with the GEX software installation files, right-click on each \*.dll file and select “Properties”. If the file is blocked, click the “unblock” checkbox to remove the security block.
- 7 **Move all .dll files from the Installation folder into the Modules folder located in C:\Program Files (x86)\GEX\Modules** (or the location where you have installed the application). Close the folder and go to the desktop.

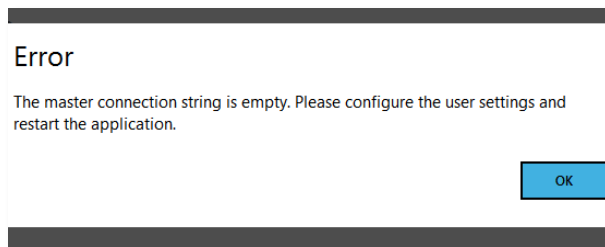


8 Double-click on the application shortcut icon “GEX” with the GEX logo that was installed on the desktop. (If the icon does not appear on the desktop, find the .exe file named ‘GEX’ located in the Program Files(x86) folder.)

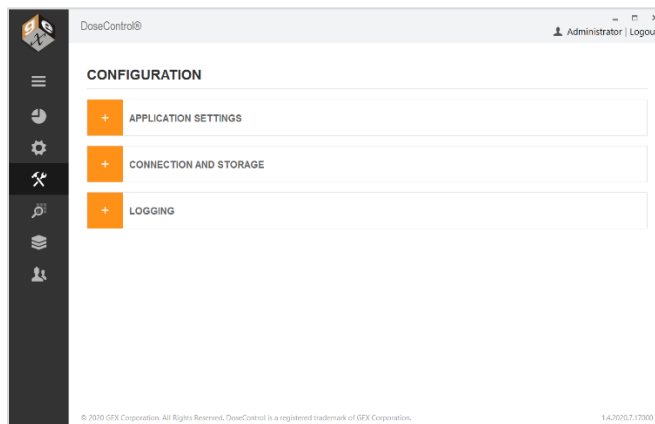


9 Next, enter your **Master Connection String** to connect the software to your SQL Server.

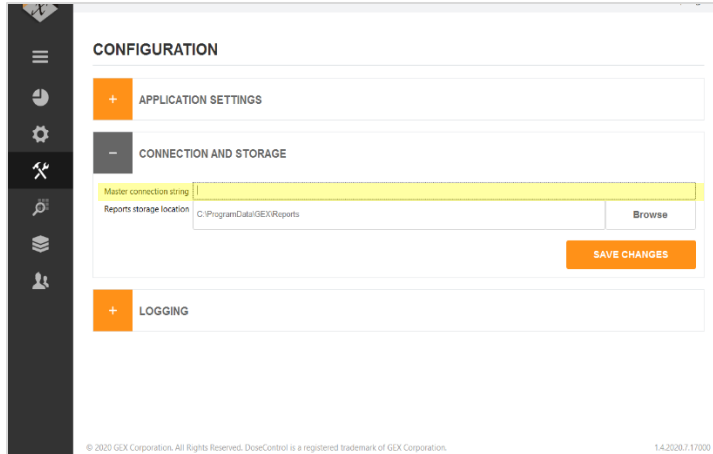
The software will show an error indicating that the master connection string is empty (see below). This connection string must be entered before you can proceed to finish the installation. Click ‘OK’.



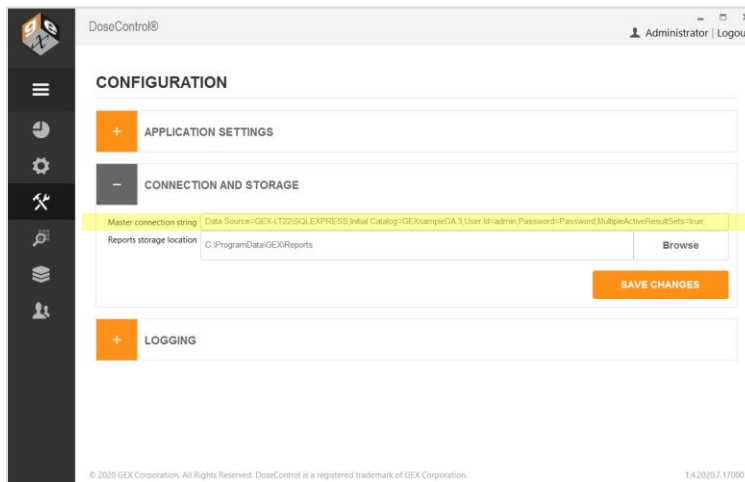
10 After you click ‘OK’ on the error message, the Configuration screen will appear.



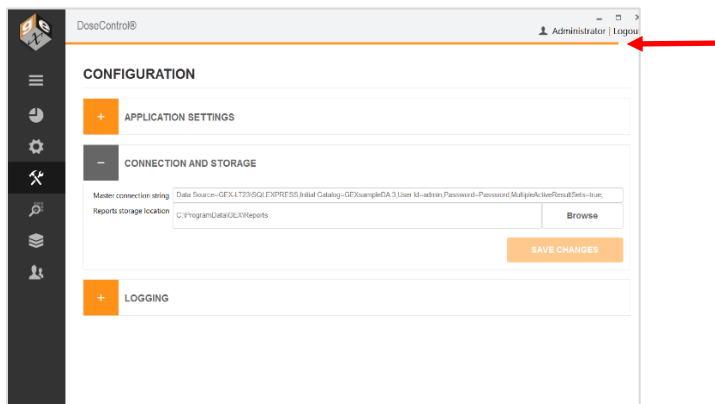
11 Expand “Connection and Storage” menu item.



- 12 Enter your connection string into the **Master Connection String field**. Refer to section [Pre-Installation](#) for instructions on how to write the connection string (connects DoseControl software to the SQL Server database).

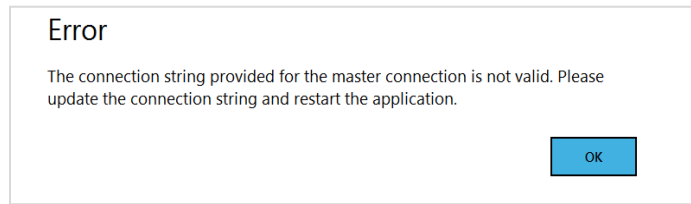


- 13 Click **“Save Changes” button one time**. If the connection string is correct, the software will initiate the connection to the database. The progress is shown by orange bar near the top of the screen. If DoseControl is having problems connecting to the database, the orange bar may go back and forth and may take some time before the screen changes.



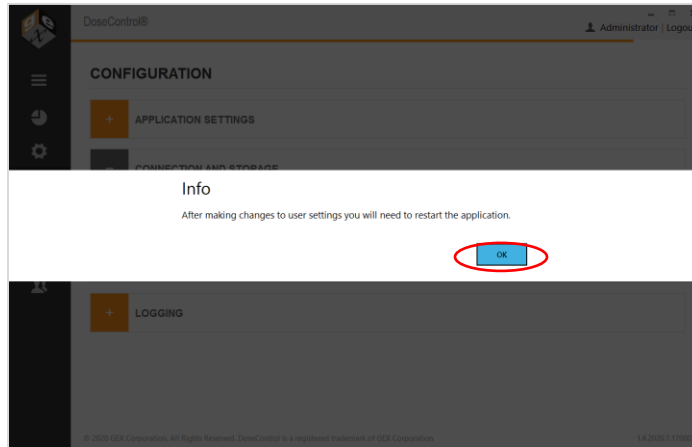
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- 14 If the connection string is not correct, an error message will appear to alert the Administrator. If this message appears, you must fix any errors or misinformation in the connection string because something is not correct.



Select 'OK'. Review the string and make any necessary changes. Select 'Save Changes' again.

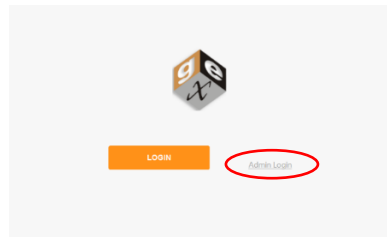
- 15 When the string is entered correctly you will be prompted by an info message to restart the application. Select 'OK'.



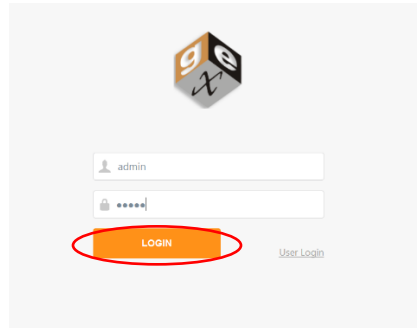
- 16 Restart the application by double-clicking the GEX application icon on the desktop.

### Next Step: Create Global Administrator Login

- 17 After first-time installation, you will be prompted to setup the **Global Administrator Login** for DoseControl. Select the small text to the right of the orange LOGIN button that says 'Admin Login'

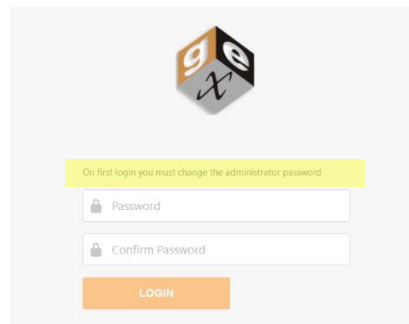


- 18 Enter username “admin” and password “admin” and select ‘LOGIN’.



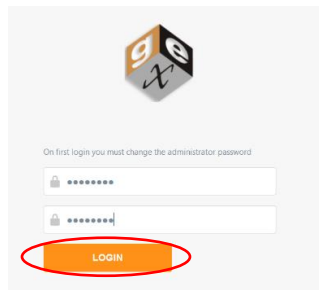
The screenshot shows a login interface with a logo at the top. Below the logo are two input fields: the first contains the text 'admin' and the second contains masked characters '\*\*\*\*\*'. Below these fields is an orange button labeled 'LOGIN' which is circled in red. To the right of the 'LOGIN' button is a link labeled 'User Login'.

- 19 You will then be prompted to change the Administrator password. There are no requirements for password length or characters. This will be the DoseControl Global Administrator password.



The screenshot shows a password change interface. At the top, a yellow banner contains the text 'On first login you must change the administrator password.'. Below this are two input fields: 'Password' and 'Confirm Password', both containing masked characters '\*\*\*\*\*'. Below these fields is an orange button labeled 'LOGIN' which is circled in red.

- 20 Type new password and confirm new password. Press ‘Login’.



This screenshot is identical to the previous one, showing the password change page with the 'LOGIN' button circled in red.

#### IMPORTANT

Please write down the DoseControl Global Administrator username and password when you create this account. It can be reset if needed, but it is best not to forget or lose it.

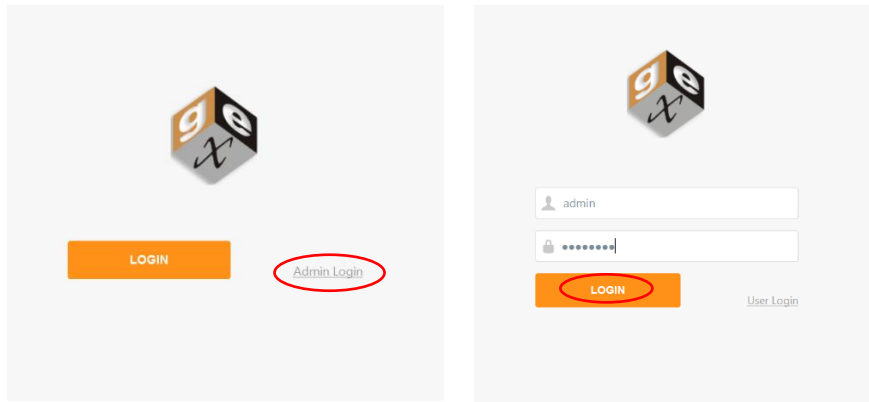
#### NOTE

The Global Administrator Login is for the DoseControl software and is not the SQL Server admin login or ‘sa’ account.

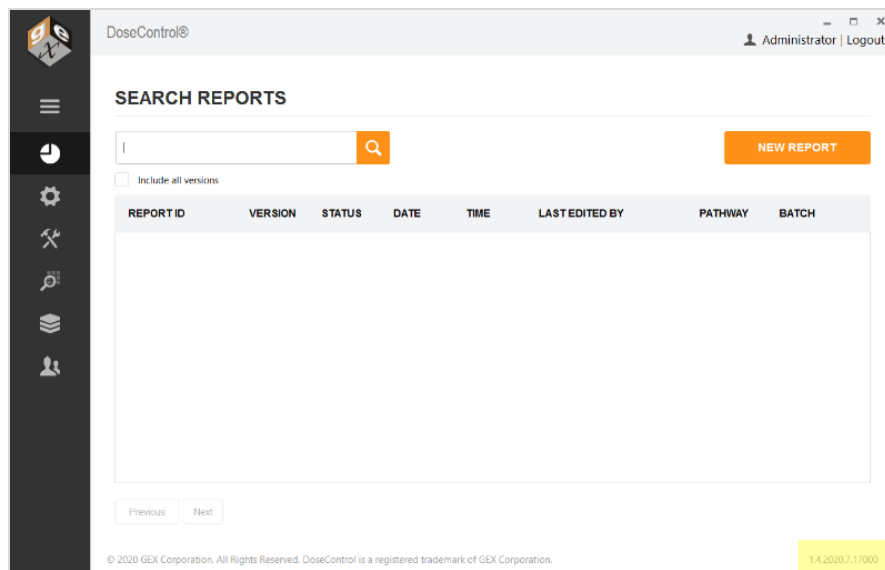
- 21 Next, login to the software as the Global Admin using your username “admin” and your new password.

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- 22 You will be taken to the Home Screen. The software installation is complete. The version number is located in the lower right corner.



- 23 **Next Step:** Configure the software. See [Software Feature Descriptions](#) and [Configure Dosimetry Process Parameters](#) sections.

## 4 Upgrade to a New Version of DoseControl Software

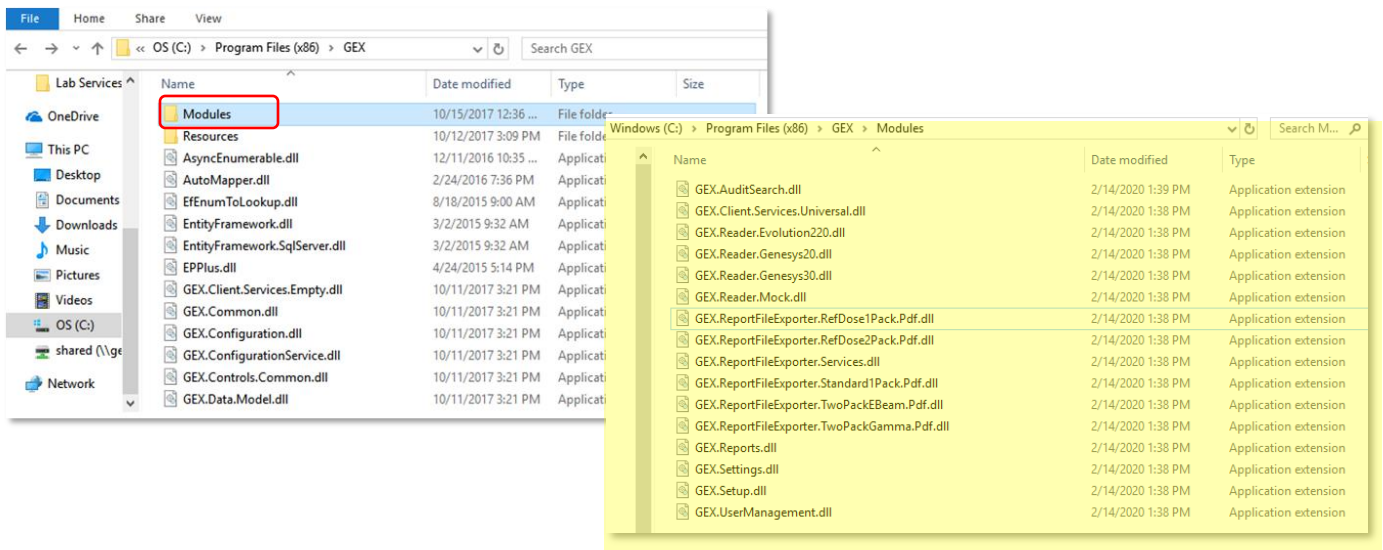
Upgrading to a new version of DoseControl software is not difficult and the process takes 10-15 minutes. All your configuration information from the previous version and your dosimetry reports and records will transfer to the new version when you upgrade.

### IMPORTANT

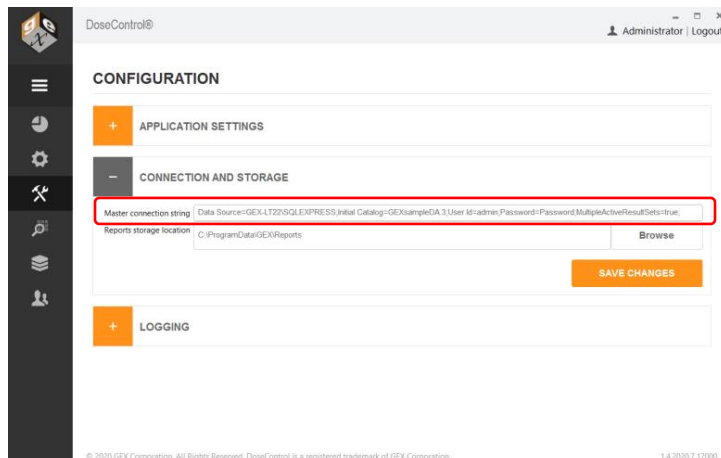
Backup your database prior to any attempted upgrade in the event something happens during the upgrade process. Also, make a copy of configuration information (take screenshots of your current configuration or keep a record of your configuration settings). See Upgrade Preparation instructions below.

### Upgrade preparation instructions:

- 1 **Take a screenshot of the list of module files for your current installation. Save screenshot image to desktop.** Go to C:\Program Files (x86)\GEX\Modules. Your modules are the \*.dll files located in Modules folder.

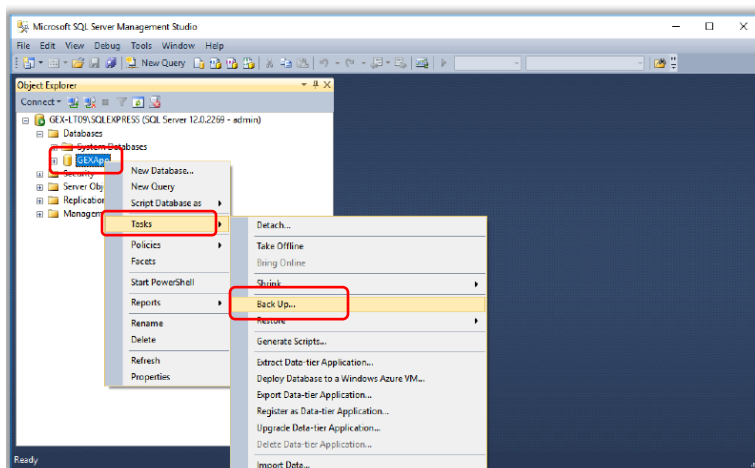


- 2 **Open GEX DoseControl software. Take a screenshot of your connection string and save image to desktop.** Copy the text of your connection string and save as a .txt file or Word file.



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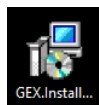
- 3 If you wish, take screenshots of any configuration settings (Readers, Calibrations, etc.). Or, keep a record of your DoseControl configuration information.
- 4 **Make a backup of your database.** Always keep a current backup of your database in the event of a problem during upgrading the software.
  - **Basic License (Local SQL Server installation on PC) Instructions:** Open SSMS (SQL Server Management Studio) and login. In the Object Explorer, open Databases. Right click on your database instance, go to Tasks > Backup. Create a \*.bak file of your existing database. For complete details see backup instructions in [APPENDIX 1: Installation & Setup of Microsoft SQL Server Express \(for Basic License\).](#)



- **Premier/Enterprise License Instructions:** Contact your IT/Technical Support to backup your SQL Server database instance of DoseControl application.

## Instructions to Upgrade GEX/DoseControl Software

- 5 Download new version of DoseControl software.
  - Download the new version install folder sent from GEX. This link was given to you by GEX.
  - Save/place install folder onto your desktop.
- 6 Uninstall old version of GEX/DoseControl application.
  - Uninstall GEX/DoseControl application from each PC workstation you wish to upgrade (use the "Add/Remove programs" via Windows system settings).
  - Delete the GEX Program folder (found in C:\Program Files (x86)\GEX).
- 7 Install new version of GEX/DoseControl application
  - Double click the .msi installer in the new version folder. Follow prompts to install the new version of DoseControl on your PC. Install will take less than 1 minute.



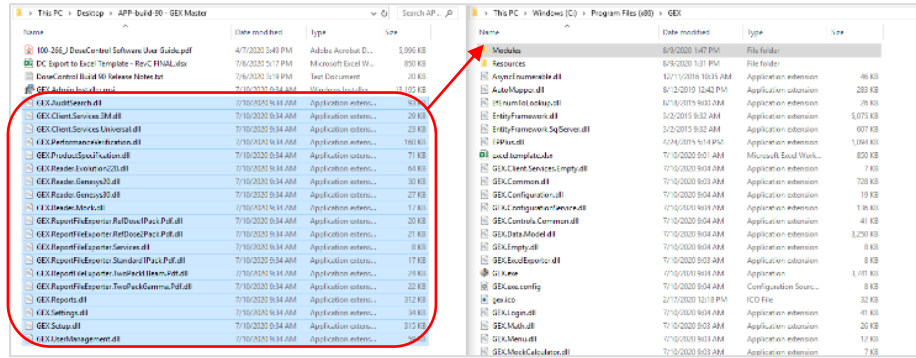
- 8 Place the modules for the new version of GEX/DoseControl into Modules folder.

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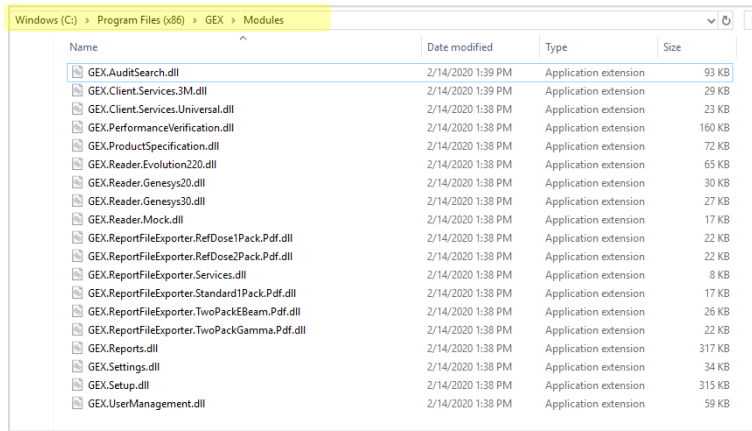
**NOTE**

Ensure the Modules \*.dll files are 'unblocked'. Go to the modules folder for the GEX application. Right-click on the first \*.dll file and select properties. Click Unblock. Repeat for all \*.dll files.

- Copy all the \*.dll files (module files) that are included in the install folder. These modules are specific to your software installation – there may be new, additional modules added for your upgrade.



- Go to Program Files(x86)\GEX\Modules and paste the copied Modules into the Modules folder.

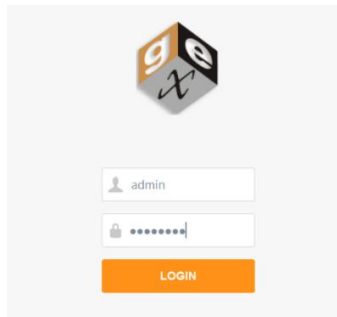


**IMPORTANT**

Remember the modules in Program Files(x86)\GEX\Modules must include all the modules from the previous installation at a minimum. Compare the screenshot of your previous install Modules folder to the new Modules folder. Your new installation must have all the same module files as your old version, plus any new modules included with the version – you cannot have any missing module files, or the upgrade will not complete. See the [Troubleshooting](#) section below to resolve any errors.

- 9 On your desktop you will see the **GEX/DoseControl application icon**. Double click to open.
- 10 Enter your Global Admin username and password when prompted.

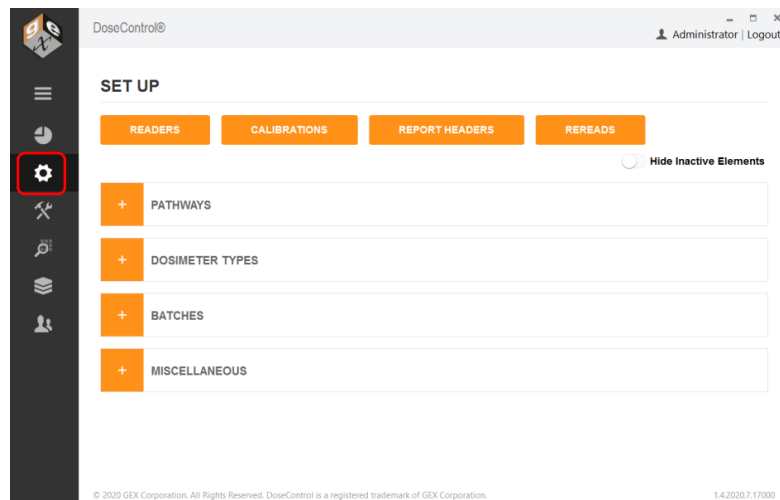




- 11 **The upgrade process is complete.** You should see the Reports home screen of the GEX/DoseControl software with the new version ID (see screenshot below with highlighted version ID). The home screen should list your existing dosimetry reports.

REPORT ID	VERSION	STATUS	DATE	TIME	LAST EDITED BY	PATHWAY	BATCH
Admin1	1	Incomplete	8/11/2020	2:32 PM	Administrator	edean1	DA
Admin2	1	Incomplete	8/11/2020	2:29 PM	Administrator	edean1	DA
CT1	1	Incomplete	8/11/2020	11:44 AM	Administrator	edean1	DA
CT1-04-7	1	Incomplete	8/5/2020	7:13 AM	Administrator	edean1	DA
CT1-nb-max	1	Incomplete	8/5/2020	7:07 AM	Administrator	edean1	DA
CT1-01	1	Incomplete	8/5/2020	7:05 AM	Administrator	edean1	DA
CT1	1	Incomplete	8/5/2020	6:55 AM	Administrator	edean1	DA
CT1	1	Incomplete	8/5/2020	6:52 AM	Administrator	edean20w	DA
Admin1-10-1	1	Incomplete	8/5/2020	6:52 AM	Administrator	edean20w	DA

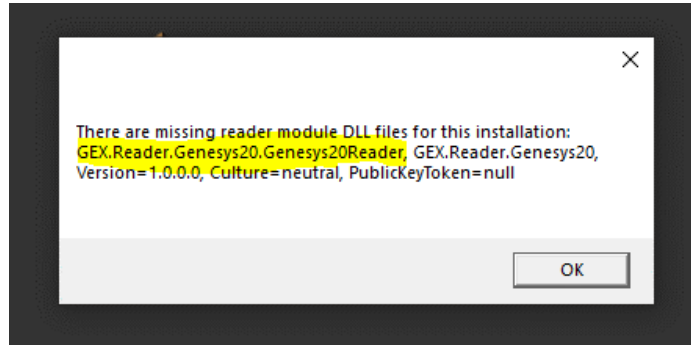
Your configuration settings should be intact. Under the sprocket icon check that your set up is correct.



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## Troubleshooting – How to Resolve a Common Error During an Upgrade

All the module files (\*.dll files) in the upgrade must match the original installation. If a module is missing, you will see an error message indicating which module files are missing. Example of this error message:

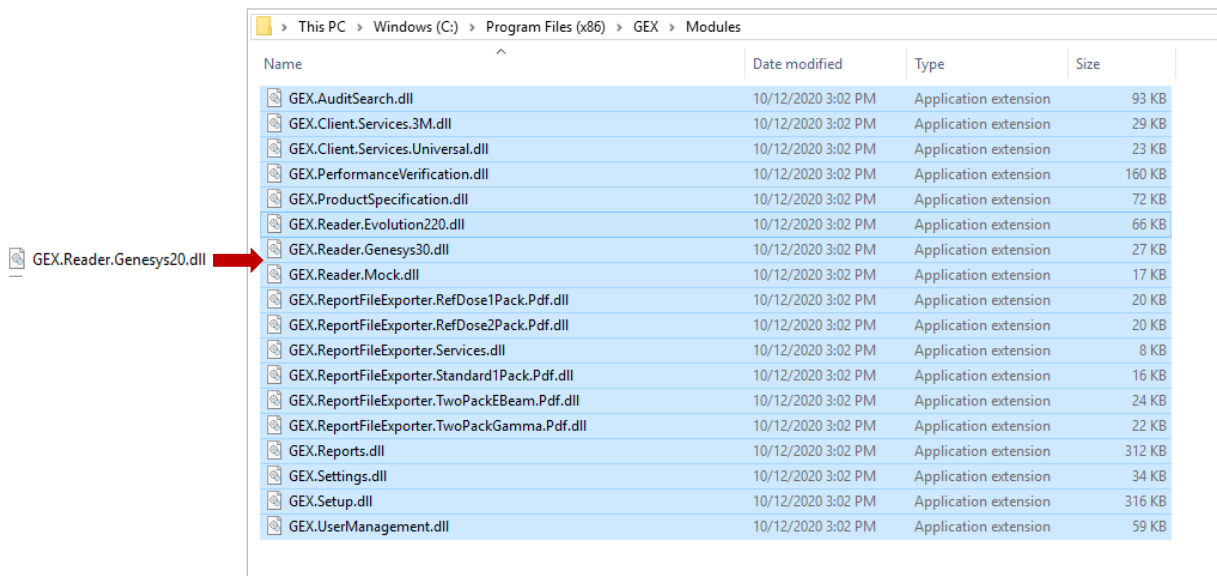


Why would a module file be missing? There are several possible reasons:

- ✓ The module file is missing from the installation package sent from GEX. Contact GEX if one of your module files is not included in the installation package sent to you. Email [cs@gexcorp.com](mailto:cs@gexcorp.com) or call +1 303400-9640.
- ✓ The module file is blocked by your security settings. To 'unlock' the \*.dll files included with the GEX software installation files, right click on each \*.dll file and select 'Properties'. If the file is blocked, click the 'unlock' checkbox to remove the security block.
- ✓ The module file was accidentally not copied into C:\Program Files (x86)\GEX\Modules.

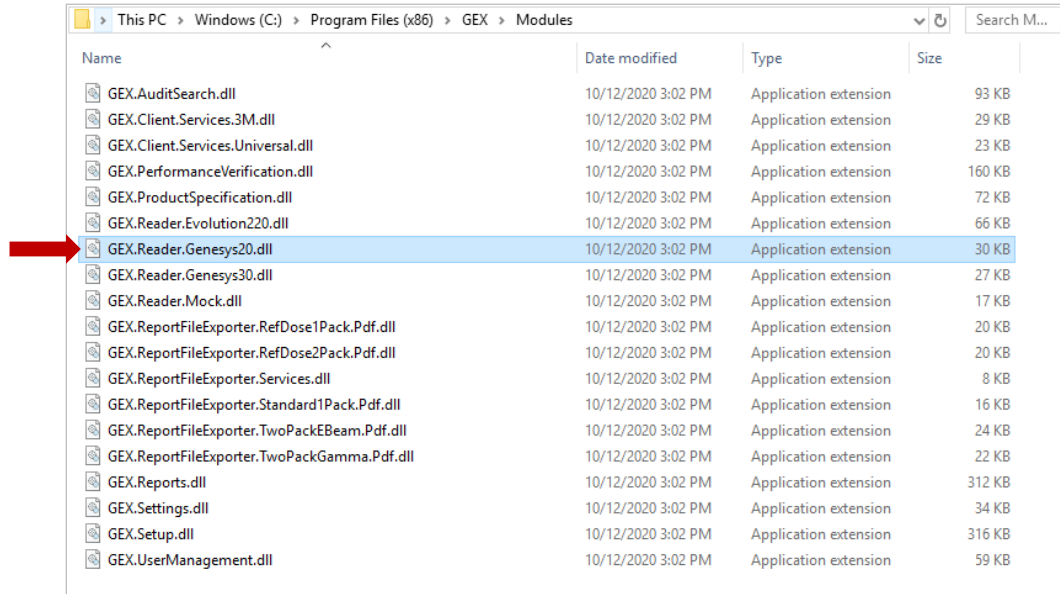
### To resolve this error:

**Step 1:** Determine which module file is missing.



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**Step 2:** Place the missing file into C:\Program Files (x86)\GEX\Modules.



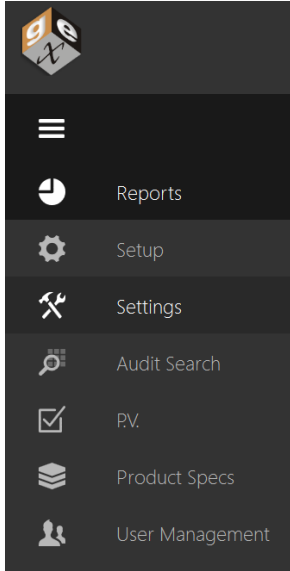
The screenshot shows a Windows File Explorer window with the address bar set to "This PC > Windows (C:) > Program Files (x86) > GEX > Modules". The window displays a list of files and folders. A red arrow points to the file "GEX.Reader.Genesys20.dll", which is highlighted in blue. The table below represents the data shown in the File Explorer window.

Name	Date modified	Type	Size
GEX.AuditSearch.dll	10/12/2020 3:02 PM	Application extension	93 KB
GEX.Client.Services.3M.dll	10/12/2020 3:02 PM	Application extension	29 KB
GEX.Client.Services.Universal.dll	10/12/2020 3:02 PM	Application extension	23 KB
GEX.PerformanceVerification.dll	10/12/2020 3:02 PM	Application extension	160 KB
GEX.ProductSpecification.dll	10/12/2020 3:02 PM	Application extension	72 KB
GEX.Reader.Evolution220.dll	10/12/2020 3:02 PM	Application extension	66 KB
GEX.Reader.Genesys20.dll	10/12/2020 3:02 PM	Application extension	30 KB
GEX.Reader.Genesys30.dll	10/12/2020 3:02 PM	Application extension	27 KB
GEX.Reader.Mock.dll	10/12/2020 3:02 PM	Application extension	17 KB
GEX.ReportFileExporter.RefDose1Pack.Pdf.dll	10/12/2020 3:02 PM	Application extension	20 KB
GEX.ReportFileExporter.RefDose2Pack.Pdf.dll	10/12/2020 3:02 PM	Application extension	20 KB
GEX.ReportFileExporter.Services.dll	10/12/2020 3:02 PM	Application extension	8 KB
GEX.ReportFileExporter.Standard1Pack.Pdf.dll	10/12/2020 3:02 PM	Application extension	16 KB
GEX.ReportFileExporter.TwoPackEBeam.Pdf.dll	10/12/2020 3:02 PM	Application extension	24 KB
GEX.ReportFileExporter.TwoPackGamma.Pdf.dll	10/12/2020 3:02 PM	Application extension	22 KB
GEX.Reports.dll	10/12/2020 3:02 PM	Application extension	312 KB
GEX.Settings.dll	10/12/2020 3:02 PM	Application extension	34 KB
GEX.Setup.dll	10/12/2020 3:02 PM	Application extension	316 KB
GEX.UserManagement.dll	10/12/2020 3:02 PM	Application extension	59 KB

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## 5 Software Feature Descriptions

### Menu bar description



**Reports:** The main/home screen of the application you will see when DoseControl opens. It displays and allows search of a list of existing dosimetry reports, and where creating new dosimetry reports is initiated.

**Setup:** Configuration your dosimetry, such as batches, readers (spectrophotometers), and calibrations.

**Settings:** The system and IT related configuration fields, such as the connection to the SQL database, network file storage configurations, user access setup.

**Audit Search:** View the complete history of all activity recorded by DoseControl, with filters, search and audit report creating capabilities.

**P.V. (Performance Verification)\*:** The P.V. module is currently only available for the Evolution spectrophotometer. It provides a minimal performance verification testing routine at one point of photometric accuracy and wavelength accuracy designed as a 'daily verification'.

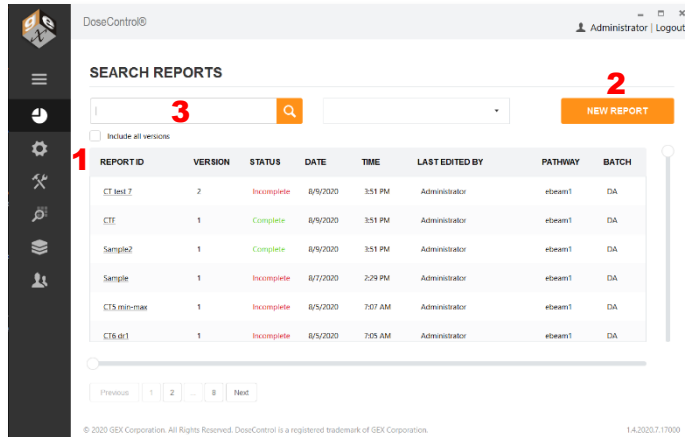
**Product Specifications\*:** The optional Product Specs module has the areas to configure dosimetry parameters such as Min and Max Dose specifications and dose mapping correlation ratios for specific products. The user can select a product name from a dropdown menu, and the process specifications will automatically populate the headers of the new dosimetry report.

**User Management:** Configure user roles and permissions when using the MSSQL or LDAP user management modes.

*\*Optional modules not available to all users*

### Reports (Home) screen description

The Reports screen displays a list of existing reports and allows you to create reports and search for reports.



**Report ID:** The unique name of the dosimetry report

**Version:** Report version number. Check the 'Include all versions' box to see all versions of reports; uncheck to see only the most current versions.

**Status:** A report must be 'incomplete' or 'complete'. A 'complete' report is a processed report that cannot be altered. Incomplete reports need to be completed.

**Date and Time:** The date and time of the last view/edit to the report

**Last edited by:** The name of the user to last edit the report

**Pathway:** The radiation pathway for the report

**Batch:** The dosimeter batch ID for the report

### Report Screen actions:



- 1 Click on a Report ID to open a dosimetry report and go to the active measurement screen.
- 2 Click New Report to begin a new report, fill in the relevant dosimetry process information for that report, and go to the active measurement screen.
- 3 Search existing reports. Type a partial or full Report ID or dosimeter ID.

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## Measurement screen description

The numbers in the picture above correlate to the numbered descriptions below

- 1 **Header Info** – The header is collapsible and expandable by selecting the orange text ‘Less Details’ or ‘More Details’ on the upper-right side of the screen. The header section will display the following information:
  - Report ID/Name and the report version
  - Dosimeter batch ID, batch version, batch thickness
  - Pathway ID
  - Measurement instrument status
  - Spectrophotometer name, serial number, measurement wavelength, spectral bandwidth
  - Calibration - dosimetry system calibration information (Cal ID, Cal date, Cal min/max dose).
- 2 **Reader (Spectrophotometer) status** – the status is always indicated in the top-left of the screen:
  - READY** indicates that the system is ready to make a measurement.
  - INITIALIZING** indicates that the instrument is initializing.
  - BUSY** indicates the instrument is performing some function such as a measurement or zero.
  - FAILED** means that an instrument is not detected (see troubleshooting for more details).
- 3 **Dosimeter List** – List builds as dosimeter measurements are taken. Each row contains the **Dosimeter ID**, **Thickness**, **Absorbance**, and **Dose** for each measurement. The row that is highlighted in grey in the list indicates which dosimeter’s information is being displayed in the active “Measure” area of the screen.
  - The  icon indicates that a dosimeter has been re-measured.
  - The  icon indicates that the dose exceeds the calibrated range. Dose measurements that are outside of the calibrated range are also highlighted in **bold red font**. Doses that are outside of the range are not valid, and the notification should alert the operator to review the measurement.

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3	DA_7642987A	0.490	0.0174 mm	29.9 kGy
4	DA_7642988A	0.588	0.0174 mm	37.3 kGy ↻
5	DA_7642989A	0.061	0.0174 mm	1.4 kGy ▲
6	DA_7642990A	0.471	0.0174 mm	28.5 kGy
7	DA_7642991A	0.906	0.0174 mm	65.5 kGy ▲ ↻
8	DA_7642992A	0.496	0.0174 mm	30.3 kGy

Dosimeter list with icon alerts

4 Measure – The Measure section displays the information for the active dosimeter.

- A. **Dosimeter ID:** Unique identification for the dosimeter. For B3 dosimeters, the Dosimeter ID includes the batch ID and Dosimeter number. Click in this field and scan the dosimeter barcode into this field, or type a Dosimeter ID.
- B. **DSM Position (optional):** The user can enter the dosimeter position in ‘DSM Position’ (optional). This would be the location of the dosimeter in the process load. For a dosimeter placed at the ‘Reference Position’ the technician may enter “Ref”.
- C. **Tote ID (optional):** The user can optionally enter the tote ID (i.e. carrier number). This field may also be used in other ways for continuous conveyor type E-beam systems to describe succession of dosimeters (e.g. 1, 2, 3) for your records.
- D. **Dose (kGy):** Displays the dose calculation for the active dosimeter.
- E. **Absorbance:** Displays the measured absorbance of the active dosimeter.
- F. **Thickness:** Displays the thickness of the dosimeter, as configured by the Admin in Batches setup. (The ability to edit the thickness is a user permission, as configured by the Admin. In this screenshot, the logged in user has permission to edit and save a dosimeter thickness value.)
- G. **Replicate(s):** Displays the dosimeter replicate for the current dosimeter measurement. Example:

Measurement with 1 replicate

Measurement with 2 replicates

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## Measure Screen Buttons

The measurement screen has the following action buttons:

The screenshot shows the 'Measure' screen. At the top left, a '< BACK' button is labeled with a red '1'. At the top right, a 'REPORT SUMMARY' button is labeled with a red '2'. Below the navigation bar, the report ID is 'Sample version 1', DSM Batch is 'DA', and Pathway ID is 'ebeam1'. The reader status is 'Ready' in green. A '+ MORE DETAILS' link is on the right. The 'DOSIMETERS' section has a table with columns '#', 'ID', 'ABS', 'THICKNESS', and 'DOSE'. The 'MEASURE' section includes a 'Dosimeter ID:' input field, a 'MEASURE' button labeled with a red '3', and a 'DOSE (kGy):' display showing '3'. Below the dose, it says 'Readings: 0 of 0' and '0 Reader | Skip Reading'.

- 1 Back** – Return to the Home Screen
- 2 Report Summary** – view the Report Summary screen (see *Report Summary* section for details).
- 3 Measure** – Measure button inserts the dosimeter ID into the database, verifies the instrument wavelength setting, and then measures the dosimeter absorbance if the setting is correct. If it is not correct, the instrument will correct it or will inform the technician that it is unable to proceed.
- 4 Reread** – Initiates the workflow for re-measurement of a sample, based on the user configuration described earlier and using methods as described in Rereads section. This button only appears after the initial measurement of a dosimeter has been made.

The screenshot shows the 'Measure' screen after a successful measurement. The 'DOSE (kGy):' is '17.3'. Below it, a large 'A' is followed by '0.311'. A 'REREAD' button labeled with a red '4' is on the right. Below the dose, it says 'Readings: 1 of 2' and '0 Reader | Skip Reading' with a red '5' above '0 Reader' and a red '6' above 'Skip Reading'. A 'Thickness:' input field shows '0.0174' and a 'SAVE' button is on the right.

- 5 0 Reader** – Initiates the on-screen messages and workflow to zero the spectrophotometer (the zeroing workflow is forced for all users each time a new measurement session is opened or re-opened).

### NOTE

For G20 users: If the user presses the zero button on the G20 instrument, the zeroing event is not recorded in the software audit trail. There is no method currently available for disabling the zero button on the G20 instrument. Train operators to only zero the G20 instrument through the software and not to use the buttons on the instrument so that the event is recorded in the audit trail.

- 6 Skip Reading** – allows the user to create a record when a reading must be skipped (e.g. lost dosimeter), and the user is required to enter a reason that becomes part of the report comments.

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## 6 Configure Dosimetry Process Parameters

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This section provides instruction to the Application Administrator (AppAdmin) for the configuration of the functional aspects of the software related to dosimetry. This must be done prior to using the software for dosimetry measurements and reporting.

### Overview of Setup Menu

Select the “Setup” icon on the left menu bar.



From the software Setup menu, the Application Admin can configure the following:

- **Pathways (Radiation pathways):** The software can be configured to handle dosimetry for multiple facilities, irradiators, or pathways in each irradiator. Go to Configure Pathways.
- **Dosimeter types:** Configure the types of dosimeters to be used. Go to Configure Dosimeter Types.
- **Dosimeter batches:** Configure the dosimeter batch ID that is specific to a calibration. Go to Configure Dosimeter Batches.
- **Readers (Measurement instruments):** Spectrophotometer information. Go to Configure Readers.
- **Calibrations:** Information for each dosimeter batch calibration. Calibration functions define the mathematical relationship between the dosimeter response and dose for each instrument. Each combination of pathway, batch, and reader may have one active calibration at any given time. Go to Configure Calibrations.
- **Report Headers:** Setup the information to be included in a dosimetry report by configuring report headers. For complete information about dosimetry reports and how to configure report headers, please see the Dosimetry Reports section.
- **Miscellaneous Dosimetry Workflow Configurations:**
  - **Re-reads (re-measurement of a dosimeter):** Configure dosimeter re-read process, reasons, number of re-reads allowed, how the user can do a re-read, etc. Go to Configure Re-reads.
  - **Other:** Manual Mode option, Enable '0' Reader option, User Lock Out option, Filter Report List option. Go to Configure Miscellaneous.

#### NOTE

Application Admin must complete the software setup configuration prior to qualification and usage; the software configuration must be maintained as necessary when changes to the user's dosimetry process occur such as new calibrations, new measurement instruments are added, instrument calibration dates have changed, etc.

#### NOTE

It is a requirement that a calibration be active in the system otherwise the software will not allow dosimeter measurement. Only one calibration can be active for any combination of pathway, measurement instrument (reader), and dosimeter batch at any given time.

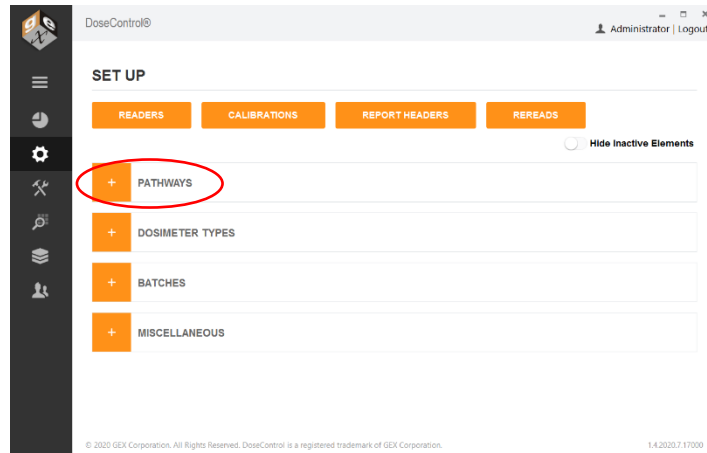
#### NOTE

For IQOQ qualification of the dosimetry system any calibration (e.g. generic calibration) may be used.

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## Pathways: Configuration



The system can be configured to handle dosimetry for multiple facilities, irradiators, or pathways within each irradiator using the “Pathway” setup feature. The App Admin must define at least one pathway for the system to function.

- 1 Enter a pathway ID, description, reference ID, and external ID to setup a pathway (hint: name all four the same unless you have special needs with integration, in which case you will have to name the external ID as needed). For example, the user may have a Production pathway and Research pathway.
- 2 Do not check the box “Produces Report”; leave unchecked unless you are specifically instructed by GEX.
- 3 Do not check the box ‘DSM Locked’; leave unchecked unless you are specifically instructed by GEX.
- 4 Activate the most used pathway as ‘default’. This will allow it to show up first in the list of options when creating a new report.

PATHWAY ID	DESCRIPTION	REFERENCE ID	EXTERNAL ID	PRODUCES REPORT	DSM LOCKED	DEFAULT	IS ACTIVE	DELETE
Production Loop	Production Loop	Production Loop	Production Loop	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Research Loop - Low	Research Loop - Low	Research Loop - Low	Research Loop - Low	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Research Loop - High	Research Loop - High	Research Loop - High	Research Loop - High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pathway 3	Pathway 3	Pathway 3	Pathway 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ADD PATHWAY      SAVE PATHWAYS

Example Pathways Setup

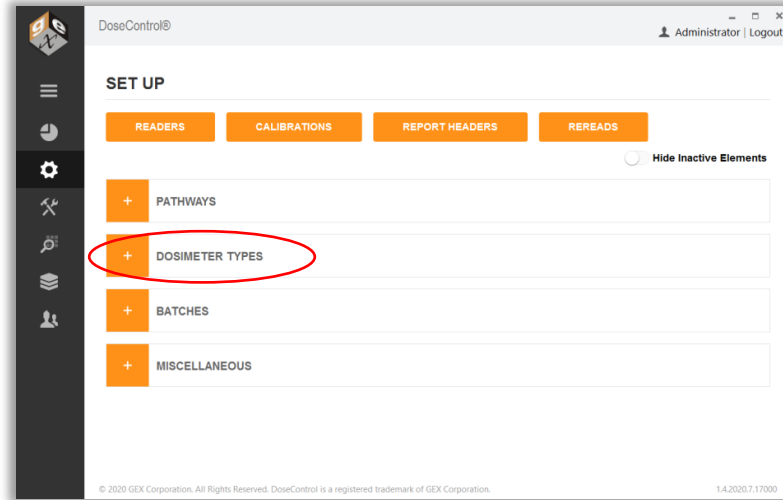
It can be useful to create multiple pathways based on the range of dose or application. For example, if an irradiator has a single pathway that is used for both routine processing and dose qualification in which the two applications may have different dosimeter calibrations.

### NOTE

Pathways cannot be deleted from the system after any dosimeter measurement or dosimetry report has been created using that pathway.

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## Dosimeter Types: Configuration



The system requires input and configuration of what types of dosimeters (B3, FWT-60, CTA, or PMMA/Perspex) will be used. (Setup Dosimeter Types before you configure Batches).

- 1 Enter a Dosimeter Identifier (name) and the manufacturer.
- 2 Select a measurement Spectral Bandwidth.
  - Use option “1 small aperture / fiber” for radiochromic film (B3, FWT) dosimeters.
  - Use option “3 2nm Slit” for Perspex or CTA dosimeters.
- 3 Enter a comment, if desired.
- 4 Use the checkbox to make a dosimeter type active or inactive.
- 5 PMMA dosimeters only – Select the “Uses Micrometer” checkbox if you are using the GEX supplied Laser Micrometer (GEX Product #P4350) hardware with your Evolution spectrophotometer.
- 6 Select the “Edit Thickness?” checkbox if you need to allow the user to manually edit a thickness value using the keyboard (the user must be assigned this role in the User Management administration – this feature can be controlled by individual user permission – See [User Access, User Roles and Permissions](#)):
  - For example, in the case of dealing with an FWT film where the actual measured thickness is different than the stated average.

DOSIMETER TYPES							
DOSIMETER IDENTIFIER	MANUFACTURER	SPECTRAL BANDWIDTH	COMMENT	IS ACTIVE	USES MICROMETER	EDIT THICKNESS?	DELETE
GEX B3	GEX Corporation	1 small aperture / fiber		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4034 Red Perspex	Harwell Dosimeters	3 2nm slit		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
FWT-60	Far West Technologies	1 small aperture / fiber		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

*Example: Dosimeter types setup*

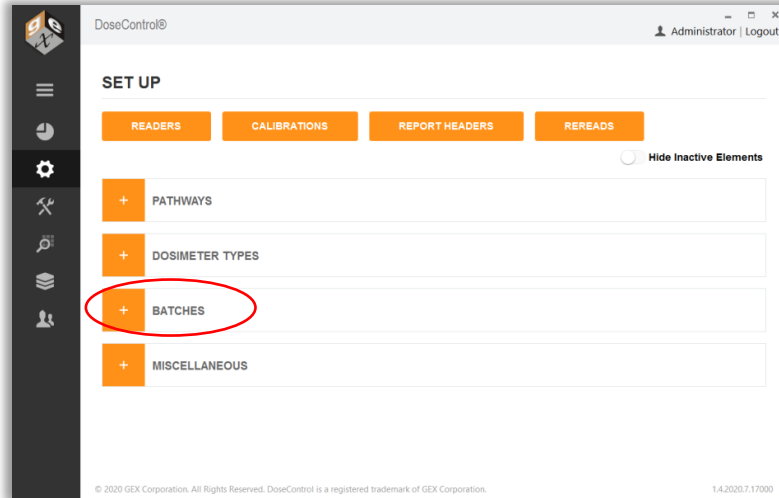
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## Batches (Dosimeter Batch): Configuration

Dosimeters are manufactured and sorted into batches. B3 dosimeters have a 2-digit alpha code to indicate the Batch ID. Each dosimeter batch is associated with a nominal average thickness value, which is printed on the dosimeter product's Certificate of Compliance and on the product box.

### Example: Batch "DA", thickness 0.0179mm

Dosimeter thickness is used in the dose calculation, so it is important to manage different batches of dosimeters. The software links a specific dosimeter batch ID and its associated thickness value.



On the Batches configuration screen, follow the steps below to setup a batch:

- 1 Select the 'Dosimeter Type' from the drop-down menu.
- 2 Enter the Batch Identifier (Batch ID), and External ID. If you are using B3 dosimeters with a barcode dosimeter ID, this Batch ID must reference the two-alpha B3 dosimeter batch ID exactly and nothing more.  
**Example:** CC or DA or AB. This is necessary for the barcode-reading feature to work, and for most Enterprise data integrations to operate without error. DoseControl verifies the two-alpha batch ID using the barcode reader and when importing dosimeter ID's that are input via integration with enterprise or process systems. See the Batch setup example below for reference on how B3 should be configured.
- 3 Enter the 'Average Thickness' for the dosimeter batch. Enter numbers only (do not include millimeters 'mm').
  - B3 dosimeters – the thickness is printed on the Certificate of Compliance received with your shipment of dosimeters and is also printed on each box of dosimeters.
- 4 Check the "Is Active" box when you are ready to make the batch and any associated calibrations available to technicians using the software.
- 5 You may enter a Quantity and any comment to go with the information (optional).
- 6 By selecting the 'Default' radio button, the batch selected will appear as the default option in the drop-down menu on the "Create New Report" screen. If a certain batch is used frequently, setting this as the default will make it easier for a technician to setup a new dosimetry report.

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BATCH IDENTIFIER	VERSION	EXTERNAL ID	DOSIMETER TYPE	THICKNESS	DESCRIPTION	IS ACTIVE	DEFAULT	BATCH QUANTITY	COMMENT	DELETE
DA	1	DA	B3	0.0179	DA 0179	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	0		
ZZ	1	ZZ	4034 Red Pe	3.0000	ZZ	<input checked="" type="checkbox"/>	<input type="radio"/>	0		

ADD BATCH      SAVE BATCHES

Example: Batches Setup

### Batch Revision Level

On rare occasions, it may be necessary to have a Batch ID with two different thicknesses configured in the software. This happens when you are using a batch of dosimeters, for example batch 'CG' with a thickness of 0.0179mm, and then receive a new shipment of dosimeters of batch 'CG' with a thickness of 0.0182mm. In this event, you will need to create a new version of the Batch ID 'CG'.

- Version 1: Batch ID 'CG', thickness 0.0179
- Version 2: Batch ID 'CG', thickness 0.0182

To use the version of the Batch ID, click the "Is Active" box. You will be able to measure dosimeters by selecting either of the active Batch ID's from the dropdown menu when creating a new dosimetry report. **NOTE:** You will not be able to mix multiple batch versions in a single dosimetry report because each Batch ID is linked to a specific calibration; you must select one Batch ID version to use in a report.

#### Follow these steps to create a new version of a Batch ID with a new thickness:

- 1 Go to Setup > Batches configuration screen
- 2 Find the Batch ID and type a new thickness value in the Thickness field. Click "Save".

BATCH IDENTIFIER	VERSION	EXTERNAL ID	DOSIMETER TYPE	THICKNESS	DESCRIPTION	IS ACTIVE	DEFAULT	BATCH QUANTITY	COMMENT	DELETE
DA	1	DA	B3	0.0179	DA 0179	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	0		
ZZ	1	ZZ	4034 Red Pe	3.0000	ZZ	<input checked="" type="checkbox"/>	<input type="radio"/>	0		

ADD BATCH      SAVE BATCHES

- 3 Version 2 of the Batch ID will appear below version 1. Click the "Is Active" box to activate the new batch version for use.

BATCH IDENTIFIER	VERSION	EXTERNAL ID	DOSIMETER TYPE	THICKNESS	DESCRIPTION	IS ACTIVE	DEFAULT	BATCH QUANTITY	COMMENT	DELETE
DA	1	DA	B3	0.0179	DA 0179	<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	0		
DA	2	DA	B3	0.0182	DA 0182	<input type="checkbox"/>	<input type="radio"/>	0		

- 4 Click "Save Batches" button.

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## Readers: Configuration

### IMPORTANT – BEFORE READER SETUP

Before using DoseControl software, setup and connect the spectrophotometer to the PC workstation. Refer to the product specification and usage documentation for the spectrophotometer to ensure the correct setup and connection to the DoseControl software.

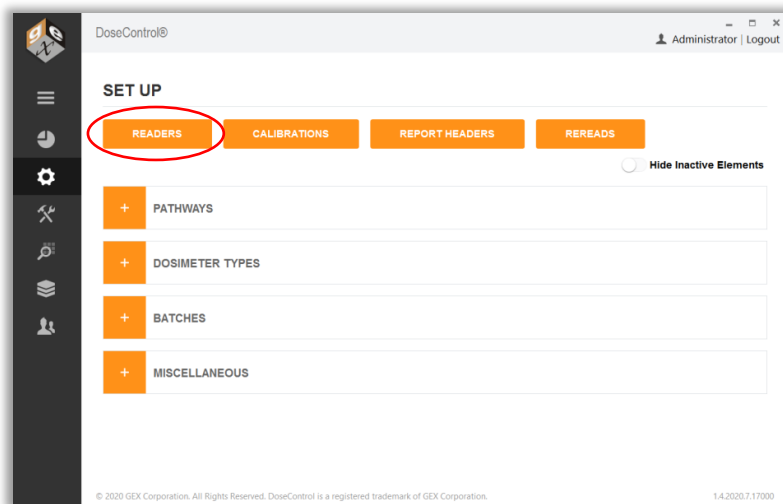
- Thermo GENESYS 30 Product Specification and Usage Document - [GEX Doc# 100-167](#)
- Thermo Evolution Product Specification and Usage Document - [GEX Doc# 100-156](#)

If you are using the integrated barcode scanner (scanner is integrated with the dosimeter holder system inside the spectrophotometer), setup the barcode scanner before using DoseControl. Refer to the product specification and usage documentation for the scanner.


- Matrix120 Barcode Scanner Product Specification and Usage Document – [GEX Doc# 100-132](#)

DoseControl controls the spectrophotometer reader, and ensures the correct reader is connected to the system to ensure data integrity. Each spectrophotometer must be configured within the software and properly connected to work with the software and PC. Information you will need:

- Spectrophotometer instrument serial number
- PC name (the machine name of your PC workstation to be used with the dosimetry system)
- Connection information
  - COM port number for the GENESYS 30 or Evolution
  - Baud rate settings
- Spectrophotometer instrument calibration dates



To setup a new spectrophotometer in DoseControl software, follow the steps below:

- 1 Click the “Readers” button from the  Setup Menu.
- 2 Next, click the “Add New Reader” button.
- 3 **Reader ID:** Enter name for the spectrophotometer that will be the on-screen and report name for this reader. Examples – “Lab 1 G30 reader” “Dosimetry Lab G30”.

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- 4 **Model Info:** Select the spectrophotometer model type from the dropdown.
- 5 **Is Active:** The instrument status. Check "Is Active" if the instrument will be used in the dosimetry process. Uncheck the "Is Active" tick box when you want to remove the reader from service, and the software will prevent any user from making measurements with that instrument even if they connect it to a DoseControl PC.
- 6 **Min Reading Value:** The minimum absorbance that should be considered a valid measurement.
  - Thermo GENESYS 20 specification for min reading value is "0".
  - Thermo GENESYS 30 specification for min reading value is "0".
  - Thermo Evolution specification for min reading value is "0".
- 7 **Max Reading Value:** The minimum absorbance that should be considered a valid measurement.
  - Thermo GENESYS 30 specification for max reading value is "2.5".
  - Thermo GENESYS 30 specification for max reading value is "3".
  - Thermo Evolution specification for max reading value is "4".

#### NOTE

The software will flag measurements outside the reader's Min/Max range as invalid measurements. The data is retained but the value is not counted as a "measurement" or a "reread"; the value is flagged as archived in the database.

- 8 **Serial Number:** Enter the serial number of the GENESYS 30 as it appears on the equipment tag. The software verifies the instrument's serial number upon initialization (when the software is first opened), before every zero "0" of the GENESYS 30, and every dosimeter measurement; this S/N verification provides measurement data traceability.

#### NOTE

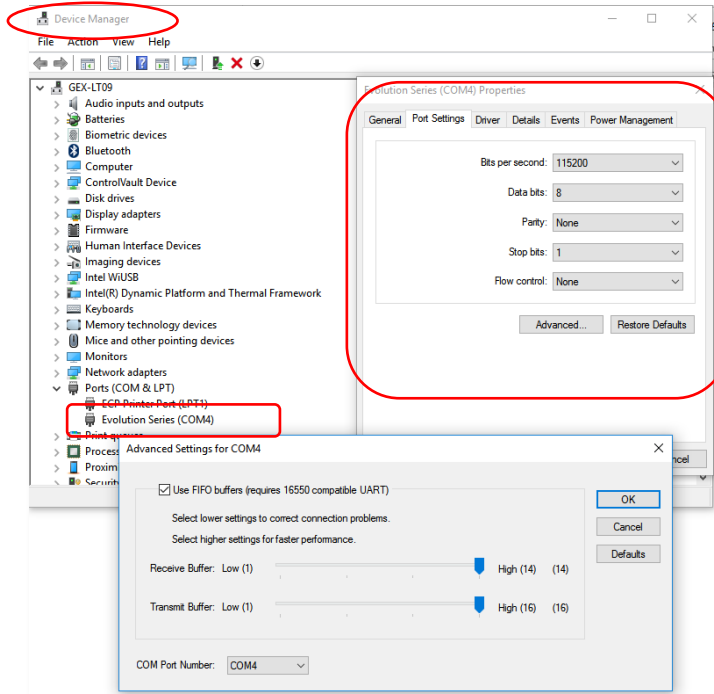
If the reader's serial number configured in the software does not match the actual serial number of the reader connected to the system, the instrument will not operate.

#### NOTE

For the older models of Thermo spectrophotometers, the serial number of a GENESYS 20 cannot be electronically verified by the software (GENESYS 20 readers cannot be used as part of an FDA 21 CFR part 11 compliant system). However, you may enter the serial number of the GENESYS 20 in the "Serial Number" field for record keeping purposes.

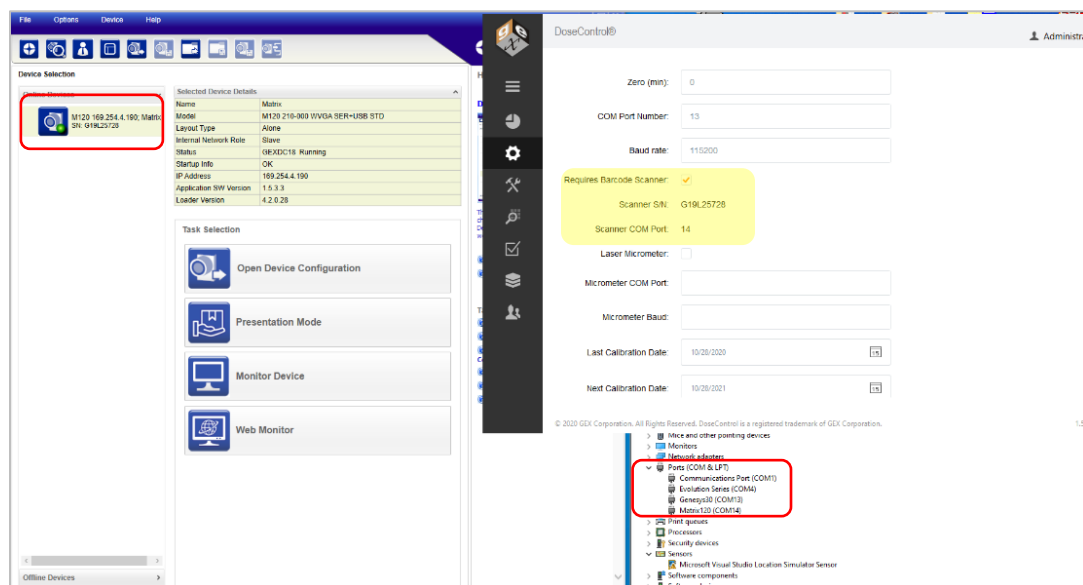
- 9 **Description:** Enter descriptive information about the spectrophotometer. The purpose is to help to the Application Administrator in large organizations identify one reader from another. Example: "located in the lab" or "G30 ABC123 located in Lab 1".
- 10 **Make (Optional):** Enter the reader's manufacturer name, if desired, "Thermo Scientific".
- 11 **Client Machine Name:** Enter the exact Microsoft Windows PC name. The software will verify that it is connected to this specific PC each time the software is opened; and the software will give an error message and prevent use of the measuring functions if this PC name is configured incorrectly. The Client Machine Name verification provides measurement data traceability. Go to your PC settings, device specifications.
- 12 **Zero (Optional):** Enter a maximum idle time (in minutes) for the spectrophotometer before the system alerts the user to zero "0" the reader.
- 13 **COM Port Number:** Ensure the spectrophotometer has been installed and connected as per the instructions given in the reader's [product document](#). Enter the COM port number of the connected spectrophotometer. To find the COM port number, on the PC go to "Device Manager" and "Ports (COM and LTP)". Find the instrument located in the list under "Ports". Right-click and select 'properties' and 'advanced' to display and/or change the port settings.

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- 14 Baud Rate (bits per second):** Use a baud rate of 115200 for the GENESYS 30 and Evolution. For the GENESYS 20 use 9600. Enter the baud rate into this field. Ensure the same baud rate entered in this field is the same displayed in the MS Windows' Device Manger; they must match. Follow the directions above for how to find the port/baud settings on the PC.
- 15 Requires Barcode Scanner (internal barcode scanners only):** Tick this box if the reader has an internal barcode reader, installed with the GEX holder system inside the reader. (Do not tick this box if you have an external barcode reader). You can use an external barcode reader to scan dosimeter IDs, but you do not need to set up external readers in the Reader configuration.

- The Scanner S/N (serial number) and Scanner COM Port will automatically populate if the scanner is setup and connected to the PC.



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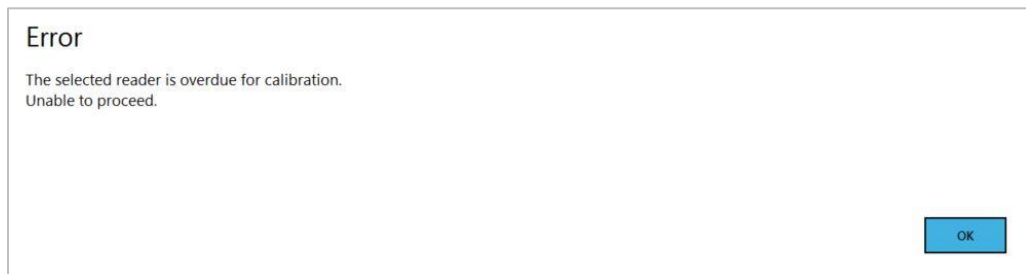
**NOTE**

For software version 1.5.x and higher the previous barcode scanners sold with the system, the Microscan MS-2 and MS-3, are no longer supported in the DoseControl software. Users must upgrade to the Datalogic Matrix 120 barcode scanner to retain barcode scanning functionality.

- 16 Laser Micrometer (PMMA only):** Tick this box if reader has an internal laser micrometer installed on the GEX holder system inside the Evolution reader. Locate the port number for the laser micrometer in Device Manager. Baud rate will be 115200.
- 17 Last Calibration Date:** Enter the Date the spectrophotometer was last calibrated or the date of the last complete performance verification.
- 18 Next Calibration Date:** Enter the Date the spectrophotometer must be calibrated next or the date that a complete performance verification is required. The Application Admin may change this date anytime as needed.

**NOTE**

The system will prevent measurement activities if the spectrophotometer is not within the specified calibration date timeframe. If the "Next Calibration Date" has expired, the software will show an error message (see example below). You must perform the performance verification for the spectrophotometer and the DoseControl App Admin must change the Reader's "Next Calibration Date" to a new date in the future.

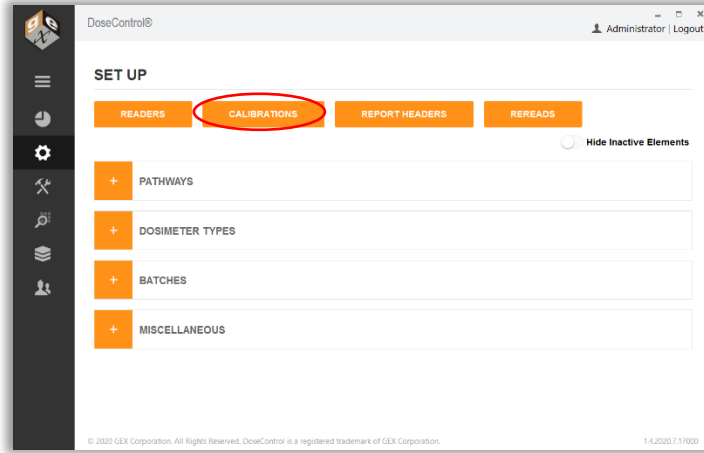


- 19 Comment (Optional):** Enter a comment regarding the spectrophotometer.

## Dosimeter Batch Calibrations: Configuration

### IMPORTANT

Before entering a new Calibration, make sure the Pathway, Batch, and Reader are “active” for the calibration you wish to add.



Calibration functions define the mathematical relationship between the dosimeter response and dose for each spectrophotometer in the DoseControl dosimetry system. Using the calibration coefficients setup in the software by the Application Admin, the software calculates the absorbed dose of the dosimeter in terms of specific net absorbance ( $\Delta k$ ) where the net optical absorbance at a selected wavelength ( $\Delta A_\lambda$ ) is divided by the thickness of the dosimeter, otherwise known as optical pathlength ( $d$ ) in millimeters, as follows:  $\Delta k = \Delta A_\lambda / d$

### NOTE

Reference the methods described in *ISO/ASTM 51275, Standard Practice for Use of a Radiochromic Film Dosimetry System or related standards for PMMA or CTA dosimeters.*


To ensure dosimetry data integrity, the software verifies and ensures a specific batch of dosimeters is linked to the correct calibration and the correct spectrophotometer and irradiation process pathway, eliminating the need for dose look-up tables or manual processes. Only one calibration can be “active” at a time for each combination of dosimeter batch, reader, and irradiation pathway. See below: Calibration ID “DA cal G30” is active for batch “DA”, reader ID “GEX Lab G30” and pathway “ebeam 1”:

DISPLAY NAME	CALIBRATION ID	PATHWAY	BATCH	ABSORBANCE COUNT	READER ID	DOSE RANGE	IS ACTIVE	DELETE	COPY	COPY NAME
DA_cal_G30	DA cal G30	ebeam1	DA	1	GEX Lab G30	2.07 - 60 kGy	<input checked="" type="checkbox"/>		Copy	<input type="text"/>
Riso_cert_20C-19_CC	Riso cert 20C-19 CC	ebeam1	CC	1	GEX Lab G30	7.05 - 112.99 kGy	<input type="checkbox"/>		Copy	<input type="text"/>
Riso_2019	Riso 2019	ebeam1	CC	1	GEX Lab G30	15 - 75 kGy	<input type="checkbox"/>		Copy	<input type="text"/>

Example: Active calibration for a specific pathway, dosimeter batch, and reader.

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## NOTE

On the main Calibration screen (shown above), a list of calibrations is built over time as the user adds them. Unused Calibrations can be deleted using the trashcan icon . Please note that once a Calibration has been used and is associated with any dosimetry report in the system, the Calibration cannot be deleted.

## New Calibration Setup: Configure manually or import a CALDAT.xlsx file

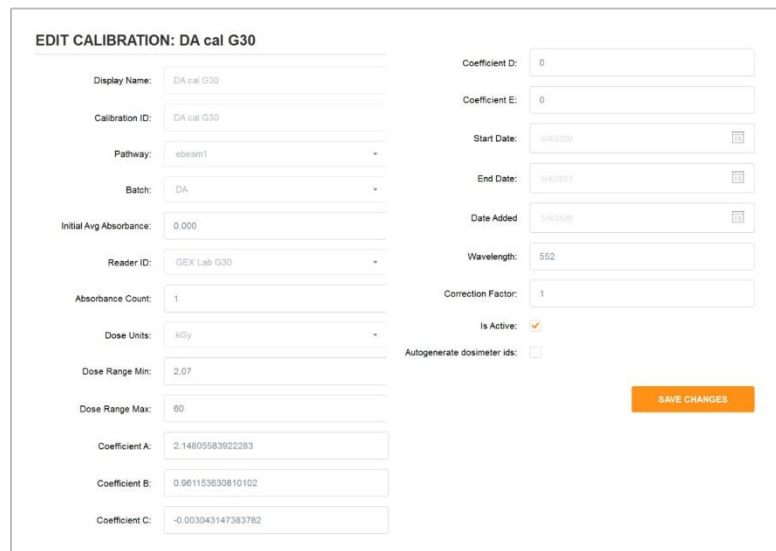
There are two ways to set up a new calibration in DoseControl:

- Enter the configuration data manually (See [Manual Setup for a New Calibration](#))
- Click and import a CALDAT.xlsx file directly into DoseControl. See [Import a New Calibration](#). CALDAT files are issued by GEX as one of the process outputs when a user contracts GEX Calibration Services to perform their curve fitting.

ADD NEW CALIBRATION

IMPORT NEW CALIBRATION

## Manual Setup for a New Calibration




EDIT CALIBRATION: DA cal G30

Display Name:	DA cal G30	Coefficient D:	0
Calibration ID:	DA cal G30	Coefficient E:	0
Pathway:	sbeam1	Start Date:	3/4/2020
Batch:	DA	End Date:	3/4/2021
Initial Avg Absorbance:	0.000	Date Added:	3/4/2020
Reader ID:	GEX Lab G30	Wavelength:	552
Absorbance Count:	1	Correction Factor:	1
Dose Units:	mGy	Is Active:	<input checked="" type="checkbox"/>
Dose Range Min:	2.07	Autogenerate dosimeter ids:	<input type="checkbox"/>
Dose Range Max:	60		
Coefficient A:	2.14805583922283		
Coefficient B:	0.961153630810102		
Coefficient C:	-0.003043147383782		

SAVE CHANGES

*Example of new calibration configuration*

To setup a new calibration in DoseControl software, follow the steps below:

- 1 On the  Set Up screen, click the “Calibrations” button.
- 2 On the main Calibration screen, click the “Add New Calibration” Button.
- 3 **Display Name:** Enter the name of the calibration to be displayed onscreen and in reports. This may be equivalent to the calibration ID or may be some other identifier that is easy to use. This calibration Display Name must be unique within the system.
- 4 **Calibration ID:** Enter a calibration ID number that is generated at the time of curve fitting that uniquely identifies the specific curve being used. This field provides reference to an external calibration report and associates it with certificates and traceability to a specific laboratory. Calibration ID must be unique within the system.

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- 5 **External ID:** Leave this field blank (unless otherwise instructed by GEX).
- 6 **Pathway:** Select the Pathway associated with the calibration from the drop-down list of active pathways. If you deactivate a Pathway in the pathway configuration, it will deactivate all calibrations associated with it. Therefore, the Pathway must be active before you can create a new calibration using that Pathway.
- 7 **Batch:** Select the dosimeter batch ID associated with the calibration from the drop-down list of active batches. If you deactivate a Batch in the batch configuration, it will deactivate all calibrations associated with it. Therefore, the Batch must be active before you can create a new calibration using that batch.
- 8 **Initial Avg. Absorbance:** Enter the initial average absorbance for the dosimeter, if any, to be used in the calculation of net absorbance  $\Delta A_{\lambda}$ . Enter '0' or leave the field empty for no value.
- 9 **Reader ID:** Select the spectrophotometer ID associated with the calibration from the drop-down list of active instruments (readers). If you deactivate a Reader in the reader configuration, it will deactivate all calibrations associated with it. Therefore, the Reader must be active before you can create a new calibration using that reader.
- 10 **Absorbance Count:** Enter the number of dosimeter replicates in the dosimeter package or pouch – this number will be specific for your dosimetry process. If a pouch has 1 dosimeter, replicate A, or so forth, enter "1". If there are 2 dosimeters in a pouch enter "2". The software will associate that there must be 'X' number of dosimeters for each dosimeter ID up to a maximum of 4.

#### NOTE

If you are using the [statistical rereads method](#) for re-reading dosimeters, this feature will only work if the absorbance count is "1". For more information, see [Dosimeter Re-reads: Configuration](#) section.

- 11 **Dose Units:** Select kGy or Gy. In either case, the resolution of dose is fixed at one significant digit in the software (e.g. 12.5 kGy or 1250.0 Gy). This resolution applies to all dose fields in the software.
- 12 **Dose Range Min:** Enter the [minimum dose from the calibration](#) so that the software will warn users when the measured dose is below this range. You can find the minimum dose from the calibration certificate provided by the certified calibration laboratory.
- 13 **Dose Range Max:** Enter the [maximum dose from the calibration](#) so that the software will warn users when the measured dose is above this range. You can find the maximum dose from the calibration certificate provided by the certified calibration laboratory.
- 14 **Coefficient A through E (0 – 4):** Enter each of the calibration coefficients using the full number of significant digits, in the order of  $a + bx + cx^2 + dx^3 + ex^4$ . If there is no coefficient value, enter a '0'.

Example of cubic curve fit coefficients, from the CALDAT.xlsx file:

F	G	H	I	J	K
CURVETY COEF0	COEF1	COEF2	COEF3	COEF4	
Cubic	2.24965141421786	0.659910896976561	-0.00173287135155131	0.00000244487572661155	0

Calibration configuration setup in DoseControl:

Coefficient A:

Coefficient B:

Coefficient C:

Coefficient D:

Coefficient E:

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- 15 **Start Date:** Select the Date on which the calibration will become active. The Application Administrator can set a date in the future when the calibration will become active, if needed. Otherwise, use today's date.
- 16 **End Date:** Select the Date on which the calibration should become inactive. The Application Administrator can set how long a calibration may be used. This date is editable after the fact so that the administrator can extend the use of a calibration, if desired. Changing the End Date is an audited event.

**NOTE:**

The End Date is not editable after the Calibration is used in the software. To change the End Date of a Calibration, you must make a copy of the Calibration and edit the End Date field in the new Calibration.

- 17 **Date Added:** Autogenerated date when the calibration is added to the software.
- 18 **Wavelength:** Enter the wavelength of measurement in nanometers (nm) that is used for the calibration. For B3 dosimeters, this wavelength is 552 (unless otherwise indicated on your calibration certificate provided by the certified calibration laboratory). Enter without any units (e.g. '552').
- 19 **Correction Factor:** Enter a linear correction factor to be applied to the measured dose. Enter a value of "1.0" if there is no correction factor used in your calibration (most typical). A correction factor can be used for a variety of reasons but is not common.
- 20 **Is Active:** The calibration must be checked as 'Active' to be used in the software. The system will automatically inactivate a calibration if pathways, readers, or batches associated with the calibration are inactivated.
- 21 **Auto generate Dosimeter ID's:** Check this box to have the system automatically generate random Dosimeter ID's. Use this feature only if you DO NOT want the user to manually enter Dosimeter IDs or if you are not using a barcode scanner to enter Dosimeter IDs. For example, if the user wants to simply read dosimeters in sequence and not add the extra time of manually typing dosimeter ID's.

**IMPORTANT**


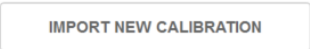

Currently, the Auto-generate Dosimeter ID feature cannot be changed or edited after using a calibration. It must be determined by the user in advance of using the calibration if the user wants to use it or not.

- 22 Check the "Is Active" box to activate the new calibration for use.
- 23 To finish, click "Add Calibration" button.


**Import a New Calibration**

**NOTE**

Import feature is only available for GEX calibration files CALDAT.xlsx. For calibrations provided by other calibration laboratories, please manually configure the calibration information directly into the software. See [Manual Setup for a New Calibration](#) directions.

- 1 On the  Set Up screen, click the "Import New Calibration" button.
- 2 Click the "Import New Calibration" button 
- 3 Select the CALDAT.xlsx file 
- 4 Click the carrot icon to import.

**Select Calibration**

IMPORT	CALIBRATION ID	START DATE	COEFFICIENT A	COEFFICIENT B	COEFFICIENT C	COEFFICIENT D	COEFFICIENT E	DOSE RANGE MIN	DOSE RANGE MAX
	20C-19	5/7/2020	2.24965141421786	0.659910896976561	-0.001732871351551	2.444875727E-06	0	7	109.4

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- 5 Most of the calibration information is directly uploaded into the new calibration setup. To complete the new calibration setup, complete the missing fields (see field descriptions above).
- 6 Check the "Is Active" box to activate the new calibration for use.
- 7 To finish, click "Add Calibration" button.

### How to Verify Dose Calculation of a Calibration

The Edit Calibration screen features a push-button verification test report using the "Validate" button. With the output the Application Admin can verify the dose calculation is correct before activating a calibration in the software. The output is a PDF file that can be saved or printed. Compare any field on the PDF to the Dose Table from the calibration or any other information from the calibration such as the coefficients and document the results on paper.

See screenshot below:

The screenshot shows the 'EDIT CALIBRATION: 3575' screen in the DoseControl™ software. A red circle highlights the 'VALIDATE' button. A red dashed line connects this button to a PDF report titled 'Calibration Function Output Verification'. The PDF report contains the following information:

Calibration Name: Ev220-2 P1 BA  
 Calibration ID: 3575  
 Report Created: 08/26/2019 09:48 AM  
 Wavelength: 552nm  
 Min / Max Dose: 1.9 / 150.2 (kGy)  
 Initial Abs: N/A  
 Pathway ID: Ebeam  
 Batch ID: CI

COEFF. A: 2.0814557627493  
 COEFF. B: 0.989487896291596  
 COEFF. C: -0.004200474221622  
 COEFF. D: 5.255407044E-06  
 COEFF. E: 1.6139427E-08

Batch thickness: 0.0174  
 Reader Serial #: 5A21123001

A	Calculated Dose (kGy)
0.05	N/A
0.10	3.8
0.20	9.9
0.30	16.4
0.40	23.4
0.50	30.8
0.60	38.8
0.70	47.5
0.80	57.0
0.90	67.6
1.00	79.5
1.10	93.0
1.20	108.6
1.30	126.2
1.40	145.2
1.50	N/A
1.60	N/A
1.70	N/A
1.80	N/A
1.90	N/A
2.00	N/A
2.50	N/A
3.00	N/A
3.50	N/A
4.00	N/A

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Created by: admin

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The PDF report also includes a 'Calibration Curve ID# 3575' table:

Average Original Absorbance	Average Thickness	Minimum Response	Maximum Response	Batch ID
0.000	0.0174	3.850	85.722	CI
Irradiated Absorbance	Response (Ai-Ao)/t	Estimated Dose (kGy)		
0.697	40.057	47.2		
0.698	40.115	47.3		
0.699	40.172	47.4		
0.700	40.230	47.5		
0.701	40.287	47.6		
0.702	40.345	47.7		
0.703	40.402	47.8		
0.704	40.460	47.8		
0.705	40.517	47.9		
0.706	40.575	48.0		
0.707	40.632	48.1		
0.708	40.690	48.2		
0.709	40.747	48.3		
0.710	40.805	48.4		
0.711	40.862	48.5		
0.712	40.920	48.6		
0.713	40.977	48.7		
0.714	41.034	48.7		
0.715	41.092	48.8		
0.716	41.149	48.9		

Dose Calculation Verification of a Calibration

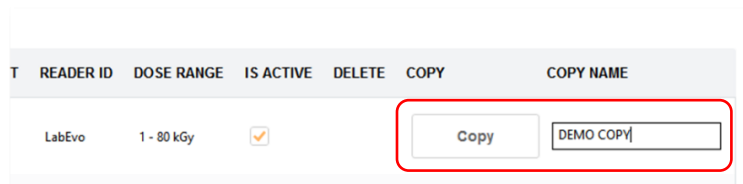
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## Copy an Existing Calibration

A duplicate calibration can be created by the touch of a button to ease configuration for some users. Enter the new Display Name that you want to use for the new calibration in the field on the far right, in the row of the calibration you wish to copy.



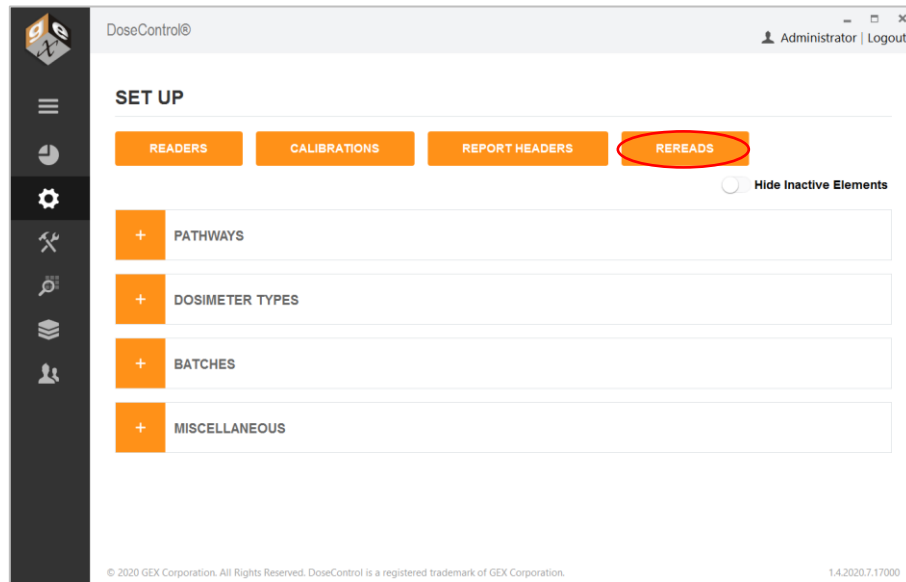
DISPLAY NAME	CALIBRATION ID	PATHWAY	BATCH	ABSORBANCE COUNT	READER ID	DOSE RANGE	IS ACTIVE	DELETE	COPY	COPY NAME
<a href="#">LV-LabEvo-P2</a>	3134	Pathway 2	LV	1	LabEvo	1 - 55 kGy	<input checked="" type="checkbox"/>		Copy	<input type="text"/>
<a href="#">DEMO COPY</a>	ef738e05-5de3-40d0-baf63-41b7588a8df	Pathway 1	CG	1	LabEvo	1 - 80 kGy	<input checked="" type="checkbox"/>		Copy	<input type="text"/>

The newly created copy calibration will be activated, and the original calibration will be deactivated. Open the new calibration that you created, make any necessary modifications to it, activate it, and save the changes.

Unlike other screens, calibrations cannot be activated/deactivated with the box on the list screen. The user must open and scroll to the bottom, activate/deactivate, and then select "Save Changes".

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## Dosimeter Re-reads (re-measurement): Configuration



### About Re-reading (re-measuring) Dosimeters

In the event a dosimeter is mishandled, placed in the holder incorrectly, is dirty, is damaged, or if a measurement value is different than expected, it is important for the Application Admin to define how a user can re-read a dosimeter in the dosimetry process. For example, if the technician reads a dirty dosimeter the resulting dose measurement will not be accurate. The technician can carefully wipe or flick dust off the dosimeter and then re-read the dosimeter, and the new (correct) dose measurement will be seen on the final dosimetry report.

By default, DoseControl software allows unlimited re-reads (re-measurements) of a dosimeter, and each re-read absorbance measurement replaces the previous measurement in the dosimetry report.

#### NOTE

Each measurement is captured and recorded by the audit trail, so the measurement history is not lost (21 CFR part 11 requirement). This means the original measurement and all subsequent re-read measurements are permanently recorded by the software. A re-read measurement value is displayed in the dosimetry report; all measurements are recorded in the audit trail.

The Application Admin can setup different requirements and restrictions for the dosimeter re-read process, if desired. An overview of what the Admin can configure for re-reads:

- **User permissions:** Restrict re-read activity to users given a re-read role.
- **Define if multiple users are required to do a re-read:** Require a different user to login and perform the re-read.
- **Define reasons for re-reads:** Admin define "reasons" allowed for the user to perform a re-read of a dosimeter. These reasons will be available to the technician in a drop-down menu. A reason is selected, and the user can then perform a re-read.
- **Define if and how a re-read measurement replaces the original measurement:** The software allows for two re-read strategy or methods:

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- **Simple Re-reads:** The user will take a measurement which will replace the original measurement on the screen.
- **Statistical Re-reads:** will require the technician to make three measurements of the dosimeter in question and, if desired, allows a statistical evaluation of the results to determine if the reread data supports accepting the original measurement or supports changing the original measurement. You can also choose to include the original measurement in the statistical evaluation.
- **Define how many re-reads can be performed for a dosimeter:** The Admin can limit the number of times a user can re-read a dosimeter.
- **Define if a comment is required by the user performing the re-read.**

#### CAUTION


The statistical reread strategy is only available when the “Absorbance Count” for a given calibration is set to “1” (1 dosimeter per pouch). This is because a method for handling one dosimeter out of a package of two total dosimeters using this strategy has not been determined.

#### CAUTION

Once a re-read reason is used for a dosimeter, the user cannot ever select a different reason. If the reread is interrupted, the software retains the position of any reread sequence so that it can enforce the number of allowed rereads. Therefore, users need to be properly trained to make their selection of the reason for rereading because failure to do so may limit the available workflows to reread that dosimeter again.

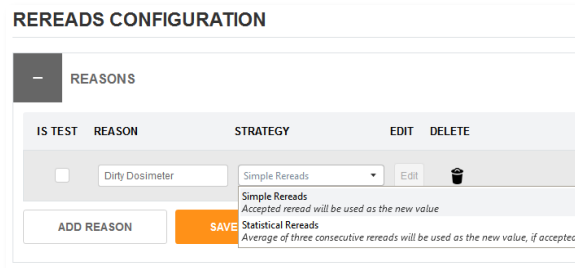
### Configure Re-read parameters

To setup a re-read process follow the steps below:

- 1 Define reasons that the technician measuring dosimeters will be forced to select from when initiating the reread workflow.
  - On the Setup  screen, select the “REREADS” button. Expand the ‘Reasons’ field by clicking on the orange box with the ‘plus’ sign next to “REASONS”.



- 2 Add as many reasons as needed using the “ADD REASON” button. If you want to use the re-read feature of the software, you must have at least one reason configured.
- 3 Define a re-read strategy (simple or statistical) for each reason. Select either “Simple Rereads” or “Statistical Rereads” from the Strategy drop-down menu.



- 4 Click the orange “Save” button to save the “reason” and the “strategy” associated with this reason.

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5 Next, click the “View” button to edit the re-read controls for this reason.

REASON	STRATEGY	EDIT	DELETE
<input type="text" value="dirty dosimeter"/>	<input type="text" value="Simple Rereads"/>	<input type="button" value="View"/>	

- Checkbox “yes/no” to limit the number of re-reads allowed by the system.

**Caution:**

When using this feature, be aware that once the number of allowed re-reads has been reached, the system will not allow any additional measurements by any user, including the Application Admin.

- If checkbox is ticked, next enter the number of allowed re-reads.
- Checkbox “yes/no” if a different user is required to perform a re-read. The software will require the user to logout and then a different user must login to the software and perform the re-read.
- Checkbox “yes/no” if the user logged in to the software must have a “Reread role”, as defined by the software user management roles and permissions setup. (See Configuration of User Access and User Roles section.)
- Checkbox “yes/no” to require the user to enter a comment on every re-read measurement performed. This allows the user to provide details about the re-read to be recorded, in addition to the “reason” selected.

6 Click “Save Changes” to save the settings.

### Example of “Simple Reread” setup

For the first example, we have chosen to allow for a user to re-read a dosimeter and the new dose measurement will replace the original measurement. The Admin has setup two reasons for a re-read:

**Dirt on dosimeter** – This reason is available in the event a dosimeter was accidentally placed on a dusty countertop or touched by fingers. The “dirt on dosimeter” reason allows the technician to re-read the dosimeter up to 3 times. No other user is required to login and perform the re-read. The technician does not need to be assigned a “Reread Role” as a user, and there is no requirement for a comment.

**Dose verification** – This reason is vaguer than a dirty dosimeter and is available whenever the user is uncertain about a measurement. Perhaps the technician did not place the dosimeter into the spectrophotometer correctly, or there was a question about the “0” zeroing of the reader, or any other concern. In this reason, the user can re-read the dosimeter up to 3 times and is required to enter a comment detailing the event.

REASON	STRATEGY	EDIT	DELETE
<input type="text" value="dirty dosimeter"/>	<input type="text" value="Simple Rereads"/>	<input type="button" value="View"/>	
<input type="text" value="dose verification"/>	<input type="text" value="Simple Rereads"/>	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>

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**EDIT REREAD STRATEGY: dirt on dosimeter**

Is there a limit for how many rereads can be taken:

Number of allowed rereads:

Is a different user required to take a reread:

Is the user required to have Reread role:

Is a comment required on every reread:

**SAVE CHANGES**

**EDIT REREAD STRATEGY: dose verification**

Is there a limit for how many rereads can be taken:

Number of allowed rereads:

Is a different user required to take a reread:

Is the user required to have Reread role:

Is a comment required on every reread:

**SAVE CHANGES**

### Example of a “Statistical Reread” setup

A statistical re-read strategy is typically used to handle a situation where the original dosimeter reading does not conform to an expectation but there is no visible dosimeter defect and we are certain that the measurement procedure was followed correctly. The Admin wants to configure re-reads for verification that the original measurement is statistically reproducible. This strategy will require the technician to make three (3) measurements of the dosimeter in question and, if desired, allows a statistical evaluation of the results to determine if the reread data supports accepting the original measurement or supports changing the original measurement. You can also choose to include the original measurement in the statistical evaluation.

In this example, we use the statistical reread strategy reason and name it “Dose Confirmation”.

When we select “Statistical Reread” strategy, on the Edit screen the Admin will see same the options available for the simple re-read configuration along with two additional configuration options specific to statistical rereads. For a statistical re-read, the Admin will need to consider the following:

- 1 Include original measurement in calculations?** By selecting this box, the system will include the original measurement in the evaluation of the average dose of 3 additional rereads taken in succession. Leaving it unselected configures the system to average only the 3 rereads together.

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- 2 Maximum coefficient of variation (C.V.):** The coefficient of variation entered here will be used as 'pass/fail' criteria for the reread session. The doses of each of the measurements will be averaged and a coefficient of variation for those doses will be calculated and compared against the value we enter here. Enter a CV value here not a CV% value – the system defaults to 0.03 (3%) and it is recommended that the value should lie between 0.003 and 0.03 (0.3% to 3.0%) depending on how aggressive the user wants to be and for what reason.

If the calculated CV of the rereads is lower than the maximum allowed that we have configured, the reread session passes, and the average dose becomes the new dose for that dosimeter ID in the dosimeter report. If it fails the CV test, the reread session fails and the original dose is retained as the measured value for the dosimeter ID, and the reread measurements are rejected.

- 3 Number of allowed rereads when using the statistical strategy:** Your value must allow for 3 rereads in a single session. A value of less than 3 will still allow three. So, for example, if you want to allow two statistical reread sessions then set the number of allowed rereads to six (6), or in multiples of 3 for any total number of sessions.

#### NOTE


In the configuration screenshot (above), we have configured it to include the original measurement in the evaluation, and we have limited the number of reread sessions to 2 (6 total rereads). This means that no user will be allowed to ever take any more rereads for that dosimeter, and there is no way for anyone (including the Administrator) to override this.

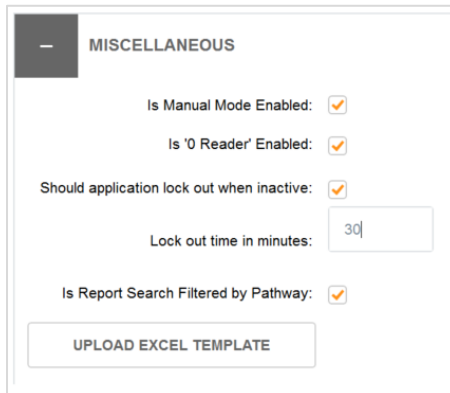
## Dosimetry Reports and Report Headers: Configuration

See [Dosimetry Reports](#) section.

### Minor Configuration Features

To setup the features list below, follow these steps:

- 1 On the  Setup screen, click to expand the "Miscellaneous" menu.



MISCELLANEOUS

Is Manual Mode Enabled:

Is '0 Reader' Enabled:

Should application lock out when inactive:

Lock out time in minutes:

Is Report Search Filtered by Pathway:

UPLOAD EXCEL TEMPLATE

- 2 Select the checkbox "yes/no" to activate a feature. See description of the features below:

#### Manual Mode

When Manual Mode is enabled, if the configured reader for the workstation is not connected or is powered off, then the Manual Mode button will appear on the measurement screen. Manual Mode allows the user to type in dosimeter absorbance values on the measurement screen. Any entry done in manual mode is flagged as 'manual' in the database

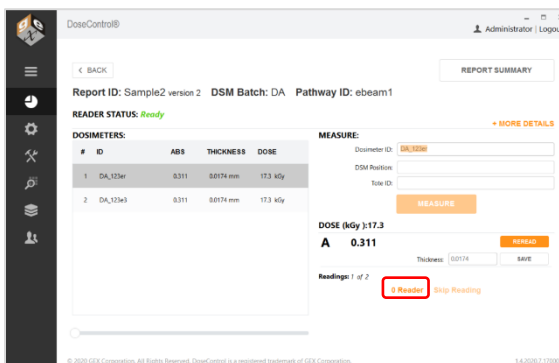
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to distinguish it from automatic measurements. This feature can be very helpful when validating the dose output of the software after configuring a calibration for a dosimeter batch.

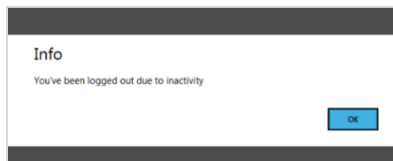
### Enable “0” Reader”

This feature removes or restores the ‘0 Reader’ button on the measure screen. The “0 Reader” button allows the technician who is reading dosimeters to decide when to zero the spectrophotometer and can do so directly from the main measurement screen.



### User Lock-Out

This feature allows the system to lock the user out of the software after a period of inactivity (in minutes). Any use of the keyboard or mouse will reset the lock-out timer. When a user is locked out, a message will display to the user:

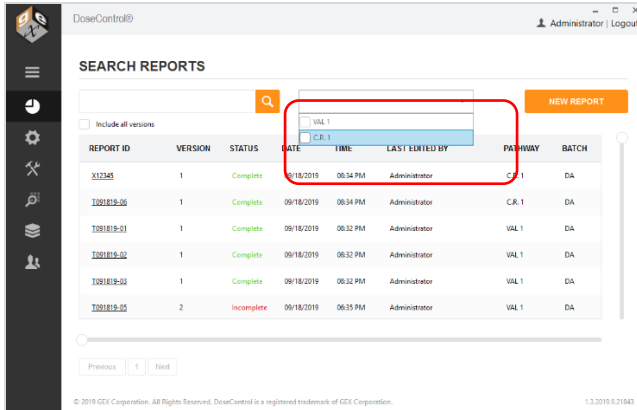


### Filter the Report List by Pathway

Activating this feature will allow the user to modify the view on the home screen (Reports List) for the PC on which the setting is activated. It is designed to segregate reports at different irradiators within one site or between irradiation sites while allowing the user to maintain a single SQL database containing all dosimetry records.

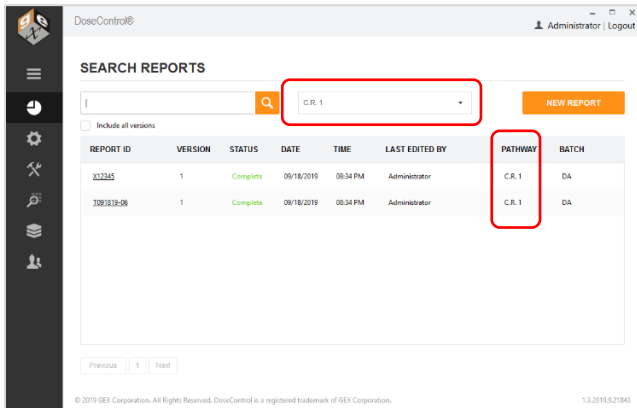
When activated the user has new filtering options on the Reports List screen to filter by one or more pathways. This is used when there are multiple dosimetry workstations or laboratories to only view the reports that are relevant to the work on that PC. The preference of these settings is maintained for all users of the PC and is modifiable by all users of the PC.

To use the feature, simply select the arrow of the new drop-down menu and check one or more Pathways you wish to view in the list. The others will not be shown.



*Drop-down menu to filter by irradiation pathway*

Once your selection is made, select the Search button to run the initial filter. Afterwards and continuously thereafter, the application will only display reports from the selected pathway:



*Filtered Report list displays one irradiation pathway*

### Upload Excel Template

The  button is used to upload a GEX provided MS Excel file. (See [Dosimetry Reports](#) section for details and instructions on how to setup and use dosimetry report templates.)

## 7 Configure User Access, User Roles and Permissions

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User access, roles and permissions are controlled by the DoseControl System Administrator. DoseControl software provides a flexible and secure way to control how users can login to the software, and what screens each user can see, and what activities each user can do within the software.

### Overview

#### User Access options:

Setup the method for user logins to the software.

**Basic (no username/password):** In Basic setup, there is no username and password requirement at login. Enabling this option will require the user to simply push the “Login” button to open DoseControl and is designed for single PC installations with a Basic software license using SQL Server Express. This user access method will record the domain and username from Microsoft Windows as the user for the audit trail in the application, and only the date and time of all logins and logouts is retained since there is only one user.

**MS SQL username/password:** In the MS SQL user access setup, user roles and permissions are managed by the DoseControl application System Administrator (onboard). The DoseControl System Admin can setup users and passwords, assign roles, make users active/inactive.

**LDAP:** In the LDAP user management option, DoseControl allows access to users with their corporate network username. This means a user can simply login to Windows (using their corporate username/password) and the DoseControl software will open for this user. This method uses an existing Lightweight Directory Access Protocol (LDAP) within a company network (typically Active Directory) and DoseControl users are managed by IT personnel. Control access to the computer via the Windows user lock-out feature to maintain 21 CFR part 11 compliant security.

**Explicit LDAP** – In the Explicit LDAP method, the user will login to DoseControl software with their LDAP username/password. DoseControl will prompt the user to enter this username/password. This method uses an existing Lightweight Directory Access Protocol/Active Directory technology within a company network and users are managed by IT personnel using Active Directory technology. Use DoseControl’s user lock-out feature to maintain 21 CFR part 11 compliant security (see [Configuration](#) section).

#### NOTE

Your company’s IT department will need to assist with the setup of LDAP user manager. This involves setting up a Microsoft Active Directory Universal Security Group for DoseControl and sub-groups within that user group to match the three DoseControl user roles (System Admin, Application Admin, Technician).

#### IMPORTANT

Basic User Manager is not 21 CFR part 11 compliant.

#### User Role options:

Assign an access level, or role, for each user; determine what screens can a user see and access.

**System Admin** – can access/manage software connections, data storage connections, user management (who can be added to DoseControl and how they use it). System Admin has access to the DoseControl software Settings icon and screen, which allows configuration of all IT-related information, connection to the database, reports storage location, etc.

**Application Admin** – can configure/set parameters for dosimetry related settings within the software, including user roles and permissions (what functions users can perform within DoseControl). Application Admin has access to the DoseControl software Setup icon and screen, which allows the configuration of all dosimetry process parameters, report setup, etc.

- Product Specification Module – The Application Admin can add, edit, and delete product specifications.

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- P.V. (performance verification) Module for the Evolution reader – The Application Admin can configure the specifications for the performance verification testing.

**Technician** – can perform dosimetry measurements and create dosimetry reports. The Technician role can only see the main Reports icon and measurement screens, and perform dosimeter measurements in accordance with the configuration settings created by the Application Admin.

- Product Specification Module – The Technician can select a product specification when starting a new dosimetry report but cannot add a Product Specification or alter any settings.
- P.V. (performance verification) Module for the Evolution reader – The Technician can perform a P.V. test but cannot configure or alter the P.V. settings.

### User Permissions available:


Allow or disallow which actions are permitted for each user. (See [Software Feature Descriptions](#) section for information about the dosimeter measurement process.)

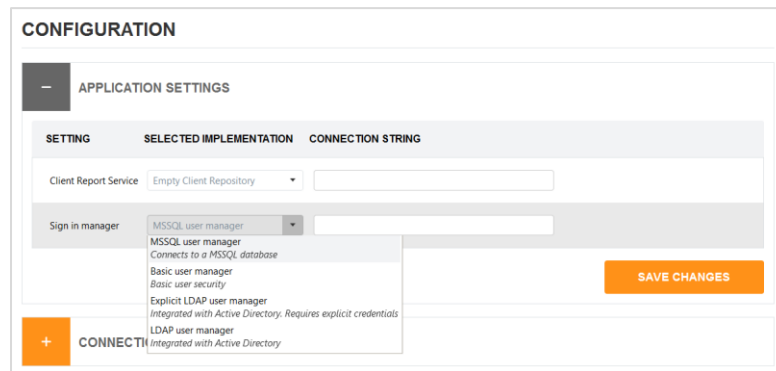
**Re-read** – allows user to perform dosimeter re-reads, under the parameters set by the Application Admin. See [Software Feature Description](#) section for information about re-reads and the dosimeter measurement process.

**Edit Dosimeter IDs** – allows user to edit or remove dosimeters from a report.

**Edit Thickness** – allows user to edit the thickness of a dosimeter for a dosimeter measurement.

## How to setup User Access for DoseControl software


- 1 Login using the DoseControl software Global Admin username and password, or as the System Admin.
- 2 Click the  Settings Configuration icon on the toolbar.
- 3 Expand the “Applications Settings” menu item.



- 4 Select a Sign In Manager option from the pulldown menu. Select one of the options: Basic user manager, SQL user manager, LDAP user manager, Explicit LDAP user manager.

## How to setup user roles and permissions using SQL user manager

### Follow the steps below:

- 1 Login using the DoseControl software Global Admin username and password, or as the user with System Admin role. Click the  Users Configuration icon on the toolbar.
- 2 From User configuration screen, you can set up new users and passwords and assign roles for each user. From the “Users” screen you can add, edit, delete, and make users active or inactive.

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USER ID	USERNAME	DISPLAY NAME	ROLES	LAST LOGIN	ACTIVE	EDIT	DELETE
1	admin	Administrator	SystemAdmin, ApplicationAdmin, Technician, Reread, EditThickness, EditDosimeterIds	8/9/2020 4:41 PM	<input checked="" type="checkbox"/>		
2	AppAdmin	Application Admin	ApplicationAdmin, Technician, Reread, EditThickness, EditDosimeterIds	5/20/2020 12:34 PM	<input checked="" type="checkbox"/>		
3	SysAdmin	System Admin	SystemAdmin, Technician, Reread, EditThickness, EditDosimeterIds	5/20/2020 12:35 PM	<input checked="" type="checkbox"/>		
4	Tech	Technician	Technician, Reread, EditThickness, EditDosimeterIds	5/20/2020 12:38 PM	<input checked="" type="checkbox"/>		
5	SystemAdmin	System Admin no read	SystemAdmin	5/20/2020 12:20 PM	<input checked="" type="checkbox"/>		
6	ApplicationAdmin	ApplicationAdmin no read	ApplicationAdmin	5/20/2020 12:22 PM	<input checked="" type="checkbox"/>		
7	Operator	Operator	Technician	8/9/2020 4:31 PM	<input checked="" type="checkbox"/>		
8	Manager	Manager	ApplicationAdmin, Technician	8/9/2020 4:28 PM	<input checked="" type="checkbox"/>		

[Add User](#)

- To add a user, select the 'Add User' button. Enter the Username, Display Name, Password. Tick "active" to make the user active in the system. Select user roles and permissions for this new user (see descriptions of User Role options and Permission above). Example:

**Edit User**

Username:

Display Name:

Password:

Active:

SystemAdmin:

ApplicationAdmin:

**Technician:**

Reread:

EditThickness:

EditDosimeterIds:

- To edit an existing user, select the sprocket icon.
- To delete a user, click the trash can icon. You can only delete users that have not used the software to create a report.
- To make a user "active" or "inactive", use the checkbox in the Active column. You can uncheck 'Active' to make a user inactive as a temporary way to enable and disable users.
- Always click "Save" button to save user settings.

### How to set up user roles and permissions using LDAP/Explicit LDAP


This method for user management utilizes an existing Lightweight Directory Access Protocol (LDAP) within a company network so that users of DoseControl can be managed by IT personnel using Active Directory technology. Most likely, your company's IT department will need to assist with the setup of

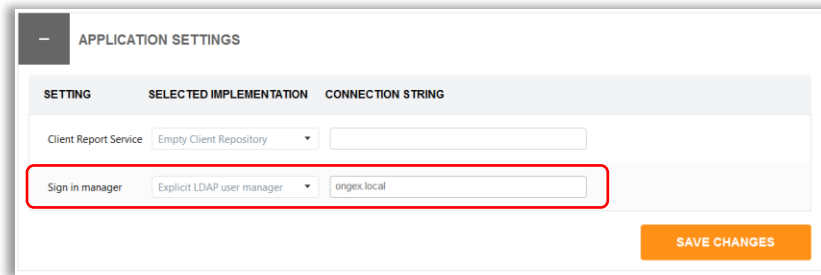
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LDAP user manager. This involves setting up a Microsoft Active Directory Group for DoseControl and sub-groups within that user group to match the four roles that DoseControl offers.

Users must be placed in one (or more) of the sub-groups based on the desired privileges for that employee. This means a single user can have multiple roles. For example, a single person needs to be in the Application Admin sub-group to administer the dosimetry aspects in the software and in the Technician sub-group to measure dosimeters.

**Follow these steps:**

- 1 Within Active Directory, have your IT personnel create user groups based on the DoseControl user roles and user permissions of “System Admin”, “Application Admin”, “Technician”, “Reread”, “Edit Thickness”, “Edit Dosimeter ID”.
- 2 Based on the desired privileges for that employee, place users in one or more of the AD user groups. Again, a user can be placed in multiple user groups (example: User1 can be Application Admin and Technician and Reread).
- 3 Login to DoseControl as the System Admin. Click on the  Configuration Settings icon and expand the “Application Settings” menu.
- 4 Select either LDAP User Manager or Explicit LDAP User Manager in the drop down menu.
- 5 Paste the Active Directory address into the “Connection String” field in the Application Settings menu.



**NOTE**

The format of LDAP connection strings varies based on the company’s network configuration. The connection string address may also be a network IP address rather than a network location name. (The example address in the image above is only an example.)

- 6 Select “Save Changes”. Close and restart the application.
- 7 Login as the System Admin and paste the Active Directory user group names (LDAP User Mapping addresses) into the respective role boxes. Click “Save Roles”.

## Roles

ROLE	LDAP GROUP MAPPING
SystemAdmin	<input type="text" value="SysAdmin"/>
ApplicationAdmin	<input type="text" value="AppAdmin"/>
Technician	<input type="text" value="Tech"/>
Reread	<input type="text" value="Reread"/>
EditThickness	<input type="text" value="EditT"/>
EditDosimeterIds	<input type="text" value="EditID"/>

[Save roles](#)

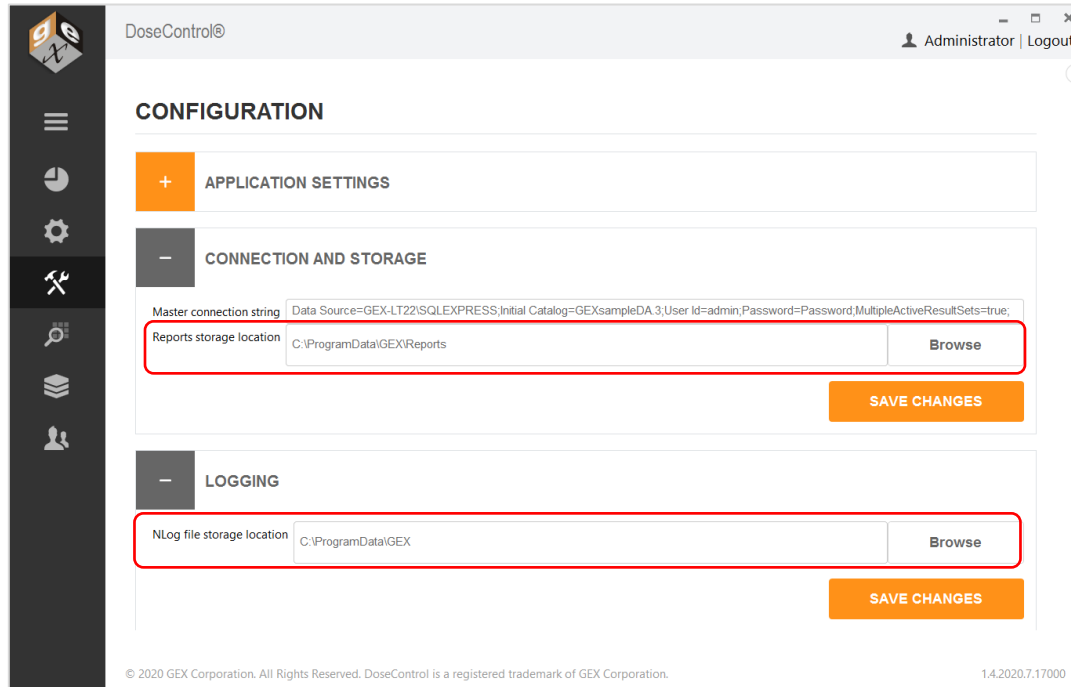
**IMPORTANT**

If a user is logged into a PC when changes are made to their membership in Microsoft AD groups by IT as they relate to the DoseControl LDAP user management, the user must log out of Windows and log back in before the changes are realized.

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## 8 Configure Storage Locations

The System Administration user role can make changes to the software settings, connections, and storage locations. Use the default file paths or change the storage locations at the time of first installation or at any time in the future.



**Reports storage location:** file pathway for where the DoseControl dosimetry reports are stored. Default is C:\ProgramData\GEX\Reports. DoseControl can use mapped network drives as storage locations (example: \\Shared\Reports). Your IT department will need to configure these network shares to allow your users' access.

**Nlog files storage location:** file pathway for where DoseControl stores error log files. GEX uses these log files to help troubleshoot any problems or errors. Keep this as the default C:\ProgramData\GEX, unless determined otherwise by your IT/Technical organization.

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# 9 Dosimetry Reports

## Overview: Dosimetry Reports in DoseControl

Dosimetry report data is output in both MS Excel (\*.xlsx) and secure PDF file types. The user can save or print a dosimetry report in Excel or PDF format. The layout and content of a dosimetry report is flexible and configurable, and the DoseControl Admin can setup one or more report types to meet the unique needs of the user's dosimetry process, such as a report for routine process dosimetry, E-beam testing, dose mapping, and dosimeter batch calibrations.

The Admin needs to set up and configure report types before using the system. When a user is ready to begin a new report and measure dosimeters, the user selects one of the configured report types displayed in a dropdown menu. The software will then prompt the user to enter any information required for the report, and then the user can begin dosimeter measurements. All the dosimeter measurements and related information are recorded and output in the pre-configured report format, to be saved or printed as Excel and/or PDF files.

## Managing dosimetry reports

The reporting feature of the software is highly flexible and allows you to control exactly what information is contained on a report and how the report looks. Any of the process and measurement data recorded by DoseControl can be output into a report, in either MS Excel or secure PDF. The Admin can create new dosimetry report types, and each report type can have different data fields and layouts, depending on specific reporting needs and requirements.

GEX provides several report types templates; or you can create custom report templates to upload into DoseControl:

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MS Excel templates (ready to use from GEX)	PDF templates (ready to use from GEX)
<p><b>Dosimeter Measurement</b> – report for measuring dosimeter absorbance and dose for routine dosimetry.</p> <p><b>Beam Energy</b> – ebeam testing, 10MeV Riso wedge</p> <p><b>Beam Scan Uniformity</b> - ebeam testing</p> <p><b>DoseMap (30)</b> – dose map report for 30 dosimeters</p> <p><b>DoseMap (85)</b> – dose map report for 85 dosimeters</p> <p><b>DoseMap (135)</b> – dose map report for 135 dosimeters</p> <p><b>Ebeam – Dosimeter Batch Calibration</b></p> <p><b>Gamma – Dosimeter Batch Calibration</b></p>	<p><b>Standard 1 Pack PDF:</b> report for measuring dosimeter absorbance and dose for routine dosimetry, 1 dosimeter/pouch.</p> <p><b>GEX Default PDF (Standard 2 Pack PDF):</b> report for measuring dosimeter absorbance and dose for routine dosimetry, 2 dosimeter/pouch</p> <p><b>Ref Dose 1 Pack PDF:</b> for routine monitoring dosimetry, includes reference dose, correlation factor, required dose. 1 dosimeter/pack</p> <p><b>Ref Dose 2 Pack PDF:</b> for routine monitoring dosimetry, includes reference dose, correlation factor, required dose. 2 dosimeter/pack</p>

Custom MS Excel templates	Custom PDF templates
<p>You can customize Excel templates as needed, using the original template provided by GEX (Excel skills required).</p> <p>GEX can customize Excel template for you (additional fee).</p> <ul style="list-style-type: none"> <li>Choose what fields appear for each report's header (what information you want included on a report)</li> <li>Create new fields, specific to your application (i.e., your product number, your process)</li> <li>Alter templates for specific use (i.e. 5MeV wedge, unique dose map)</li> <li>Change layout, add your logo</li> </ul>	<p>GEX can customize PDF template for you (additional fee).</p> <ul style="list-style-type: none"> <li>Choose what fields appear for each report's header (what information you want included on a report)</li> <li>Create new fields, specific to your application (i.e., your product number, your process)</li> <li>Alter templates for specific use (i.e. 5MeV wedge, unique dose map)</li> <li>Change layout</li> <li>Add your logo</li> </ul>

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## How to use Excel report format in DoseControl

### IMPORTANT


Before you can measure dosimeters and export measurement information into an Excel document, the Admin must setup and configure the dosimetry report headers and fields as described in [Dosimetry Reports: Configuring report types and data fields in DoseControl software.](#)

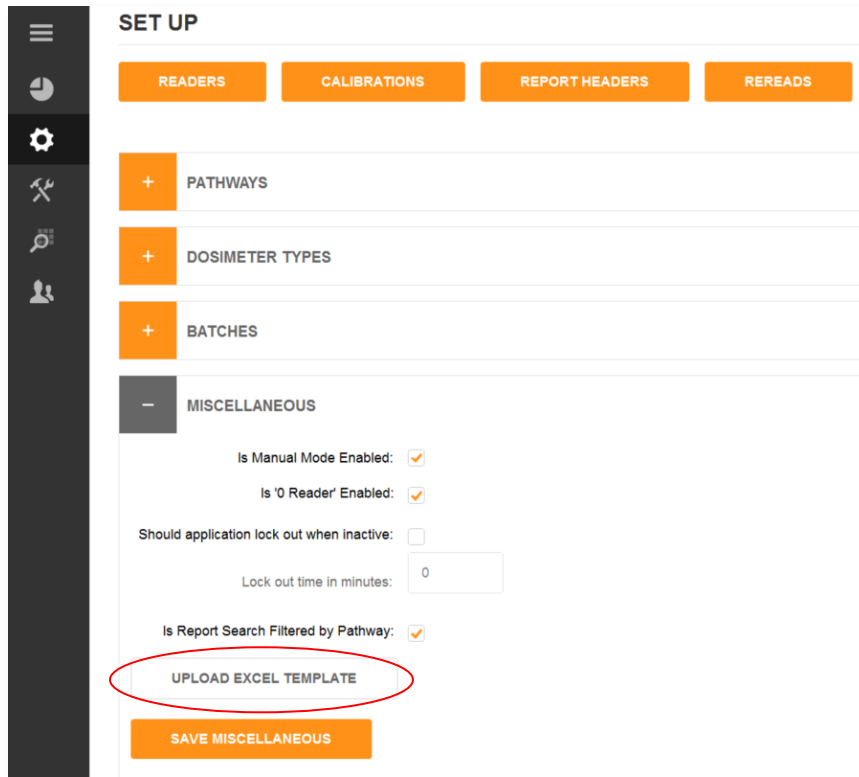
### NOTE

See [APPENDIX 4: Excel Report Data Fields](#) for complete details and examples of the pre-formatted Excel reports provided by GEX.

The Admin must upload the MS Excel template into DoseControl. GEX provides a MS Excel dosimetry report template file, which is included in the software installation folder (\*.xlsx file).

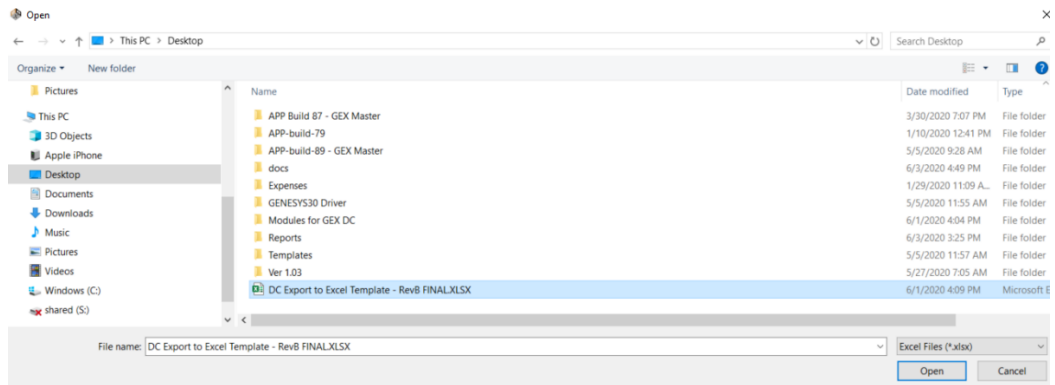
### How to upload the Excel template:

- 1 Click on the sprocket icon to open the Set Up screen. 
- 2 Open the Miscellaneous section and click the "Upload Excel Template" button.



- 3 Navigate to the Excel template you want to upload and click "Open". The template will automatically upload into DoseControl.

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- 4 Template upload is complete. (There is no alert that says successful upload). This template will now be the template used when exporting dosimetry reports to Excel from the software.
- 5 Click the “Save Miscellaneous”.

### IMPORTANT

Windows security on your PC will sometimes cause issues when using external documents, such as the \*.xlsx template provided by GEX. To avoid this, save the \*.xlsx template from the GEX installation folder to your PC and rename the file. In addition, you may also need to remove security blocks. To do this, right-click on the \*.xlsx file, go to Properties, then under the General tab Attributes click “Unblock”, and then save the file.

## How to use PDF reports in DoseControl

PDF report templates are included in the DoseControl software installation package that you received from GEX. Your IT personnel will place the PDF exporter modules (both the standard and custom PDF report templates) in the modules folder within the GEX program files upon installation of the software.

### NOTE

See [APPENDIX 3: PDF Report Data Fields](#) for complete description of data fields and examples of the standard PDF report templates.

Unlike Excel report templates, the Admin does not need to upload any PDF report templates. DoseControl will automatically recognize the PDF exporter modules and will display the available PDF templates in a drop-down menu.

### Description of PDF report exporter types:

- Standard 1 Pack PDF – for routine process monitoring with 1 dosimeter per pouch.
- Standard 2 Pack PDF – for routine process monitoring with 2 dosimeter per pouch.
- Ref Dose 1 Pack PDF – for routine process monitoring with 1 dosimeter per pouch, includes reference dose fields which calculate min and max dose to product using dose measured at a reference monitoring locatio.
- Ref Dose 2 Pack PDF – for routine process monitoring with 2 dosimeter per pouch, includes reference dose fields which calculate min and max dose to product using dose measured at a reference monitoring location.
- Custom Report PDF – can contain any measurement and process information, per customer requirements.

### Next steps:


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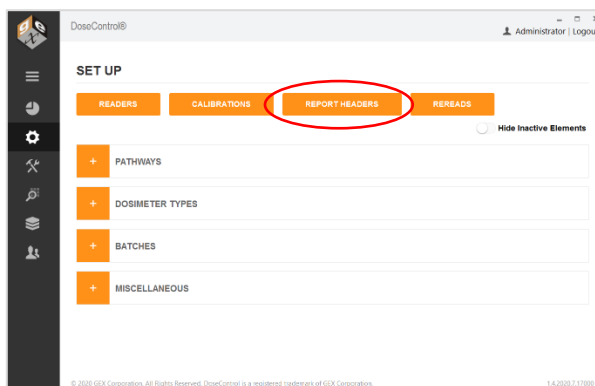
Before you can measure dosimeters and export measurement information into a PDF document, the Admin must setup and configure the dosimetry report headers and fields as described in [Dosimetry Reports: Configuring Report Types and Data Fields](#) below.

## Dosimetry Reports: Configuring Report Types and Data Fields

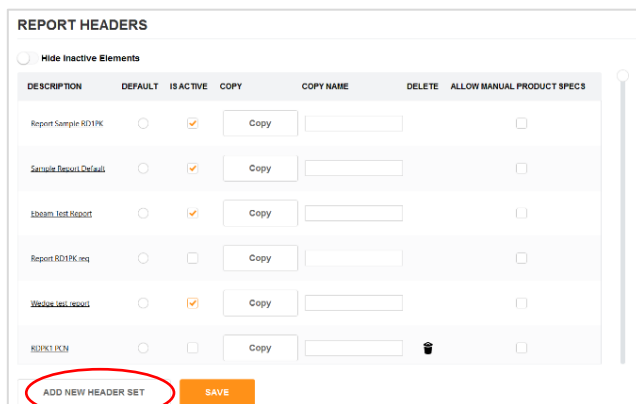
The Admin must set up dosimetry report types and data fields prior to using the software to make dosimeter measurements or creating reports.

### To create a new report type:

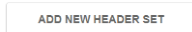
- 1 Open Set Up by clicking the sprocket icon. 
- 2 Click on the "Report Header" button.



The Report Headers main screen displays a list of report types that have been created by the Admin. Example:

A screenshot of the 'REPORT HEADERS' screen. At the top, there is a 'Hide Inactive Elements' toggle. Below it is a table with the following columns: 'DESCRIPTION', 'DEFAULT', 'IS ACTIVE', 'COPY', 'COPY NAME', 'DELETE', and 'ALLOW MANUAL PRODUCT SPECS'. The table contains six rows of report types. At the bottom of the screen, there is an 'ADD NEW HEADER SET' button (highlighted with a red circle) and a 'SAVE' button.

DESCRIPTION	DEFAULT	IS ACTIVE	COPY	COPY NAME	DELETE	ALLOW MANUAL PRODUCT SPECS
Report Sample RD1PK	<input type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Secure Report Default	<input type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ibeam Test Report	<input type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Report RD1PK.req	<input type="radio"/>	<input type="checkbox"/>	Copy	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Webpage Test Report	<input type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
RDEN1.PKN	<input type="radio"/>	<input type="checkbox"/>	Copy	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 3 On the Report Headers screen, click "Add New Header Set" button. 
- 4 Select "Exporter Type" from the dropdown menu.
  - For details about Exporter Types – see [How to use PDF reports in DoseControl](#).
  - For Excel reports, simply select "Standard 1 Pack PDF" for your exporter type.
- 5 Type a report name into the "Name" field; copy the report name into the "External ID" field

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**EDIT FIELDSET: Ebeam Test Report**

Exporter Type: Standard 1 Pack PDF

Name: Ebeam Test Report

External Id: Ebeam Test Report

**How to add report header fields to the new report configuration:**

DoseControl captures most necessary dosimeter measurement information (batch, calibration, reader information), but you may want additional content on your reports. Example of this would be your process number, product number, process or product descriptions, or anything else relevant to your specific products and process. If you want the operator/technician to enter a Process number for each report, you will need to configure this field in the report header setup.

**When to use report header fields:**

<b>Excel Reports</b>	<ul style="list-style-type: none"> <li>Report header fields not required.</li> <li>Add additional report headers, as needed. See <a href="#">How to Customize Excel report templates</a> for information about changing and adding fields to Excel report templates.</li> </ul>
<b>PDF Reports</b>	<ul style="list-style-type: none"> <li>Using GEX Default, Standard 1 pack PDF report layouts – No additional report header fields required.</li> <li>Using GEX Ref Dose 1 pack, Ref Dose 2 pack PDF report layouts – Set up report headers as defined in <a href="#">APPENDIX 3: PDF Report Data Fields</a></li> <li>Using a Custom PDF report layout provided by GEX – Set up report header as defined by GEX staff.</li> </ul>

**How to add report header fields:**

6 After you have created a Report type from the steps 1-3 above, if no additional report header fields are needed, click "Add Field Set" button on the bottom of the screen to save the new report type.



7 After you have created a Report type from the steps 1-3 above, you can add report header fields by clicking "Add New Field" button. (To quickly add a standard set of default fields, click "Add Default Fields".)

**EDIT FIELDSET: Ebeam Test Report**

Exporter Type: Standard 1 Pack PDF

Name: Ebeam Test Report

External Id: Ebeam Test Report

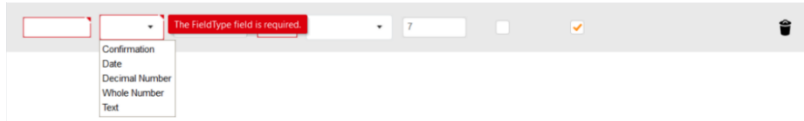
FIELD NAME	FIELD TYPE	EXTERNAL ID	LABEL	SPECIAL VALUE	SEQUENCE	REQUIRED	IS EDITABLE	ADDITIONAL VALIDATION	DELETE
PCNR	Text	PCNR	PCNR		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	
Process Date	Date	Process Date	Process Date		2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	
PI or Tower Beam	Text	PI or Tower Beam	PI or Tower Beam		3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	

ADD NEW FIELD ADD DEFAULT FIELDS SAVE CHANGES

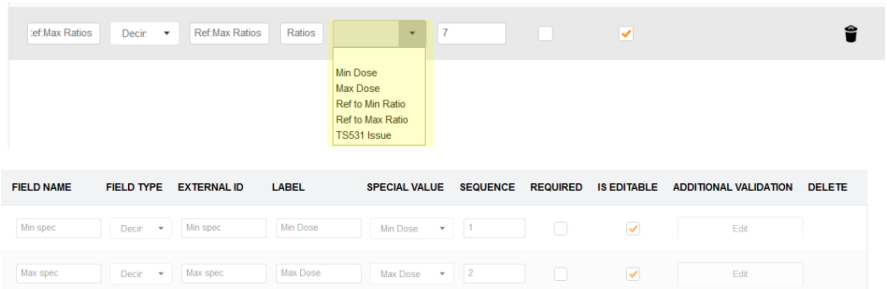
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8 Enter each field's data information. Description for each data field:

- **Field Name:** this is the name given for the field. For example, if you need the user to enter the Minimum Dose Specification you might assign a field name of "Min Dose Spec (kGy)".
- **External Identifier:** copy Field Name. The external identifier is only used in import circumstances for Enterprise license users.
- **Label:** enter the name of the field as you want to see it displayed on-screen (the software will automatically add a colon ":" at the end of the name provided when displayed to the user).
- **Field Type:** select the data type of field from the five options available in the drop-down menu:



- **Confirmation:** creates a "yes or no" field where the user can confirm something or not. Example "Were dosimeters heat-treated?"
  - **Date:** creates a date field where the user will select a date from the calendar that will default to the date of when the user is completing the field.
  - **Decimal Number:** creates a numeric field that allows decimal numbers.
  - **Whole Number:** creates a numeric field that allows whole numbers.
  - **Text:** creates a field for alphanumeric entries.
- **Special Value:** this field is usually left blank; select the Special Value from the dropdown if required. (Only used for Ref Dose report types – [APPENDIX 3: PDF Report Data Fields](#)). Special Value calculations in the software for the following:
  - **Min Dose** – allows the user to be able to enter a Minimum Dose Specification for dosimetry reports to facilitate comparison of Dmin doses against the Min Dose Specification when creating dosimetry reports.
  - **Max Dose** – allows the user to be able to enter a Maximum Dose Specification for dosimetry reports to facilitate comparison of Dmax doses against the Max Dose Specification when creating dosimetry reports.
  - **Ref to Min Ratio** – allows the user to be able to enter a Correlation Factor DRef/Dmin. The software will calculate all measured doses against the ratio.
  - **Ref to Max Ratio** – allows the user to be able to enter a Correlation Factor DRef/Dmax.. The software will calculate all measured doses against the ratio.
  - **TS531 Issue** – Disabled. Do not use.



- **Sequence:** this is a numeric value. This field allows the Admin to change the sequence number for the field (the sequence for how it will appear on the screen for the operator during dosimetry report creation) from the sequence in which the Admin entered them into the header configuration.
- **Required?:** This will set the field as "required" (the user must fill in the field for each report) – Tick both the "Required" and "Is Editable" boxes to enable the required field.

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- **Is Editable:** Always keep the “Is Editable” box checked. “Is Editable” feature allows users to make changes to entered information in a report header field, in the event of this information is not completed or mis-typed in a dosimetry report. The “Is Editable” feature is disabled only for integrated systems with information imported from other systems (Enterprise License only.)
- **Additional Validation** – add field validation requirements (if needed). Click “Edit” button to enter requirements. This adds parameters for the user and will alert the user if the field entry is outside these parameters. Examples of additional validation requirements for field: min/max limits for the number of characters allowed in the field (example: limit to a 10-digit entry), min/max range limits for dose minimum and dose maximum.

9 When finished, click “Save Changes” button on the bottom of the screen to save the new report type.

**Examples of Report Header fields setup:**

**REPORT HEADERS**

Hide Inactive Elements

DESCRIPTION	DEFAULT	IS ACTIVE	COPY	COPY NAME	DELETE
Routine Process Report	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	
Ref Dose - Routine Proces	<input type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	
Riso Wedge Test Report	<input type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	
Dose Map	<input type="radio"/>	<input checked="" type="checkbox"/>	Copy	<input type="text"/>	

**ADD NEW FIELDSET**

Exporter Type:

Name:

External Id:

FIELD NAME	FIELD TYPE	EXTERNAL ID	LABEL	SPECIAL VALUE	SEQUENCE	REQUIRED	IS EDITABLE	ADDITIONAL VALIDATION	DELETE
<input type="text" value="PCN#"/>	Text	<input type="text" value="PCN#"/>	<input type="text" value="PCN#"/>	<input type="text"/>	<input type="text" value="1"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="text" value="Process desc"/>	Text	<input type="text" value="Process description"/>	<input type="text" value="cription"/>	<input type="text"/>	<input type="text" value="2"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="text" value="Process Date"/>	Date	<input type="text" value="Process Date"/>	<input type="text" value="is Date"/>	<input type="text"/>	<input type="text" value="3"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="text" value="Dmin/Ref Rat"/>	Decir	<input type="text" value="Dmin/Ref Ratio"/>	<input type="text" value="if Ratio"/>	<input type="text" value="Ref to Min"/>	<input type="text" value="6"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="text" value="Dmax/Ref Rat"/>	Decir	<input type="text" value="Dmax/Ref Ratio"/>	<input type="text" value="if Ratio"/>	<input type="text" value="Ref to Max"/>	<input type="text" value="7"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

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### EDIT FIELDSET: Riso Wedge Test Report

Exporter Type: Standard 1 Pack PDF

Name: Riso Wedge Test Report

External Id: Riso Wedge Test Report

FIELD NAME	FIELD TYPE	EXTERNAL ID	LABEL	SPECIAL VALUE	SEQUENCE	REQUIRED	IS EDITABLE	ADDITIONAL VALIDATION	DELETE
PCN#	Text	PCN#	PCN#		1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	
Process desc	Text	Process desc	Proces		2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	
Process Date	Date	Process Date	Proces		3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	
Pit or Tower B	Text	Pit or Tower Be	Pit or Ti		4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	
Line speed	Text	Line speed	Line sp		5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	

## How to Customize Excel report templates

You can customize the \*.xlsx template provided by GEX to create your own report setups, add logos, add content fields, change the layout, etc. Once you are finished with your customizations, upload the new file into DoseControl (see steps above in About Excel report templates in DoseControl section).

The GEX \*.xlsx template is setup to receive data from the software into the first worksheet "DC Export".

### IMPORTANT

Do not delete the DC Export worksheet! DoseControl puts the dosimetry report information into DC Export.

All the other tabs are basic report templates that you can customize. The data in the DC Export cells are linked to the other reports.

The screenshot shows an Excel spreadsheet with the following data:

Report ID	Rpt Version	Pathway	DSM Batch	Status	Last Edited By	Last Edited Date	Last Edited Time UTC	Export Date	Export Time UTC
123456	1.0	beam1	DA	Incomplete	Administrator	03-Jun-2020	21:10	03-Jun-2020	21:24

Minimum Dose	Maximum Dose	Min Dose Spec	Max Dose Spec	Meets Spec?
31.20	31.20	N/A	N/A	N/A

Comments (ver. 1) = Power failure at facility for 48 hours, including process date/time impacts A/C of facility and lab areas. Noted temperature 26C, 60RH in lab area

DosimeterID	Position	TotalD	Ao	Ai - 1	Ai - 2	Ai - 3	Ai - 4	Thickness	Response	Dose	Corr Fact.	Corrected Dose	CalibrationID	Inst ID	Inst SN	WL (nm)
DA_123458	ref upper	23	0	0.507	N/A	N/A	N/A	0.0174	29.138	31.2	1	31.2	DA mock reade	Mock Spectrop	09765	552
DA_123457	ref lower	24	0	0.507	N/A	N/A	N/A	0.0174	29.138	31.2	1	31.2	DA mock reade	Mock Spectrop	09765	552

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DOSIMETRY REPORT					
PCN#: 1234AB			Dosimetry Report ID: Report Name 1234		
Process Spec:			Min Dose in Process: 31.2		
Process Date: Pit			Max Dose in Process: 31.2		
Technician: Administrator			Dmin/Ref Ratio: 0		
Dosimetry Date: 03-Jun-2020			Dmax/Ref Ratio: 0		
Instrument S/N: 09765			Reviewed by:		
Dosimeter Batch: DA		Average Thickness (t): 0.0174		Wavelength (nm): 552	
Calibration ID: DA mock read					
Average Absorbance (Ao): 0.000					
Dosimeter ID	Dosimeter Position	Irradiated Abs.	Response (At - Ao) / t x Dose (kGy)		
DA_123456	ref upper	0.507	29.138	31.2	
DA_123457	ref lower	0.507	29.138	31.2	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	
0000000	0	0.000	0.000	0.0	

See [APPENDIX 4: Excel Report Data Fields](#) for complete information, such as the details about each Excel data field, and definition of each field.

### How to set up Excel template with additional report header fields

- 1 First, the Admin must setup the additional Report Headers in DoseControl. (See: [How to create a new report type](#) and [How to add report header fields to the new report configuration.](#))
  - The report headers will automatically appear on the exported Excel DC Export worksheet.
  - These additional report fields will appear in the sequence configured in the DoseControl Report Headers setup.

The additional report headers automatically populate the dynamic section of DC Export tab.

1	Report ID	Rpt Version
2	Report Name	1232
3		
4	PCN#	1234AB
5	Process Date	6/3/2020
6	Line Speed	
7	Dmin/Ref Ratio	
8	Dmax/Ref Ratio	
9		
10		
11		
12		
13	Minimum Dose	Maximum Dose
14	31.20	31.20
15		
16	Comments	(ver.1) = Power
17		
18	DosimeterID	Position
19	DA_123458	ref upper
20	DA_123457	ref lower
21		
22		
23		
24		
25		
26		
27		
28		

### EDIT FIELDSET: RDPK1 PCN

Exporter Type: Ref Dose 1 Pack PDF

Name: RDPK1 PCN

External Id: RDPK1 PCN

FIELD NAME	FIELD TYPE	EXTERNAL ID	LABEL	SPECIAL VALUE	SEQUENCE	REQUIRED	IS EDITABLE	ADDITIONAL VALIDA
Ref Min Ratio	Decimal Numbr	Ref Min Ratio	Dmin/Ref Ratio	Ref to Min Rat	4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Ref Max Ratio	Decimal Numbr	Ref Max Ratio	Dmax/Ref Ratio	Ref to Max Ra	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
PCN#	Text	PCN#	PCN#		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Process Date	Date	Process Date	Process Date		2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Line Speed	Text	Line Speed	Line Speed		6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Addition report headers configured in DoseControl. The sequence number of the field name determines the order of the fields exported to DC Export.  
**Setup > Report Headers**

- Next, using the link feature in Excel, you will need to link the additional fields in DC Export to the correct cell of your Excel report. Repeat this process for each of the additional report header fields. (See example screenshots below.)
- When the cell linking is complete, save the Excel worksheet as your new Excel dosimetry report template. Upload the new template into DoseControl. For instructions about how to upload the template, see [How to upload the Excel template](#) in the section above.
- Every time you create a report using this Report Type template, the data from DoseControl will automatically populate the fields of the Excel report.

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**Example of linking cells in a dosimetry report template to DC Export data.**

- In this example Beam Energy report in Excel, for each purple cell, link to the corresponding field output in DC Export.
- Save the report template and upload into DoseControl.

Report ID	Rpt Version	Pathway	DSM Batch	Status	Last Edited By	Last Edited Date	Last Edited Time UTC	Export Date	Export Time UTC
Wedge Test 1 de	1	pathway1	DA	Incomplete	Administrator	15-Oct-2020	20:14	15-Oct-2020	20:14

Test Description	Process Date	Process Number	Process Specification	Power	Ave Beam Current	Line Speed
Wedge test de	10/15/2020	1234A	ABC-123	15	5	5

Minimum Dose	Maximum Dose	Min Dose Spec	Max Dose Spec
15.70	15.70	N/A	N/A

Beam Energy Test using Risø Wedge						
Test Description				Process Number:		
Process Date:				Process Specification:		
Technician:				Power, kW:		
Dosimetry Date:				Avg. Beam Current, µA:		
Instrument:				Line Speed:		
Correction Factor:	1.00	Wavelength (nm):	0	Average Thickness (t):	0.0000	
Dosimeter Batch:	0	Calibration ID:	0	Wedge S/N:		
Dosimeter ID	Depth in Al (cm)	Irradiated Absorbance (Ai)	Response (Ai - Ao)t	Dose (kGy)	Adjusted Dose (kGy)	
0000000	0.138	0.000	0.000	0.0	0.0	
0000000	0.226	0.000	0.000	0.0	0.0	
0000000	0.314	0.000	0.000	0.0	0.0	
0000000	0.402	0.000	0.000	0.0	0.0	
0000000	0.490	0.000	0.000	0.0	0.0	
0000000	0.578	0.000	0.000	0.0	0.0	

**Final result:** All data for this report will automatically populate the Excel Beam Energy report, including the additional report headers configured by the Admin Setup>Report Headers.

Beam Energy Test using Risø Wedge						
Test Description	Wedge test description			Process Number:	1234A	
Process Date:	10/15/2020			Process Specification:	ABC-123	
Technician:	Administrator			Power, kW:	15	
Dosimetry Date:	15-Oct-2020			Avg. Beam Current, µA:	5	
Instrument:	mock			Line Speed:	5	
Correction Factor:	1.00	Wavelength (nm):	0	Average Thickness (t):	0.0000	
Dosimeter Batch:	0	Calibration ID:	0	Wedge S/N:		
Dosimeter ID	Depth in Al (cm)	Irradiated Absorbance (Ai)	Response (Ai - Ao)t	Dose (kGy)	Adjusted Dose (kGy)	
DA_1234567	0.138	0.311	16.455	15.7	15.7	
DA_1234568	0.226	0.311	16.455	15.7	15.7	
DA_1234569	0.314	0.311	16.455	15.7	15.7	
DA_1234570	0.402	0.311	16.455	15.7	15.7	
DA_1234571	0.490	0.311	16.455	15.7	15.7	

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# 10 General Use of DoseControl Dosimetry System

## Overview: Measuring Dosimeters in DoseControl

To measure dosimeters in the software, you must have configured all dosimetry process parameters, dosimeter report types and report headers prior to beginning any measurements. See [Configure Dosimetry Process Parameters](#) section and the [Dosimetry Reports](#) section for more information.

### Quick links:

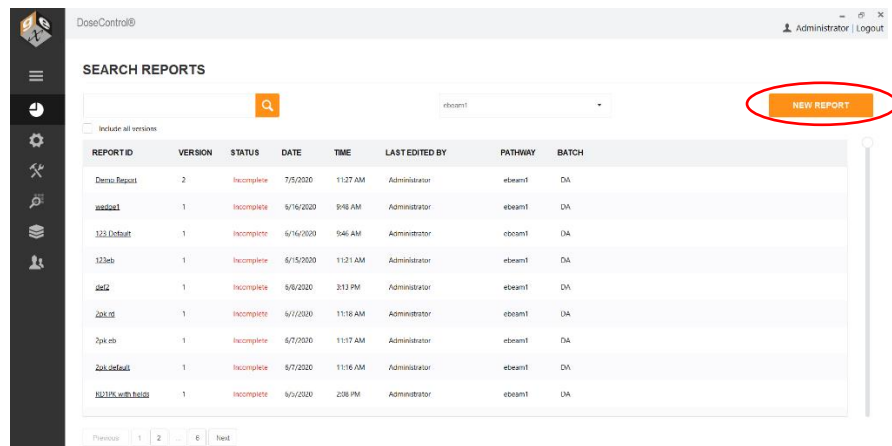
- [Process for Creating a New Dosimetry Report](#)
- [Process for Using Existing Dosimetry Reports](#)
- [How to search for a report or dosimeter ID](#)
- [Procedure for Dosimeter Measurement](#)
  - [How to re-measure \(re-read\) a Dosimeter](#)
- [About the Report Summary Screen](#)
  - [Process a Complete Report](#)
  - [How to Create a New Version of a Report](#)
  - [How to export a report to PDF or Excel format](#)
- [How to Use the Audit Trail](#)

## About Barcode Scanning of Dosimeter IDs

### Process for Creating a New Dosimetry Report

A dosimetry report will contain all the dosimeter measurement information and all the associated calibration and process information. To measure dosimeters after irradiation, the user must create a new dosimetry report:

- 1 On DoseControl's main screen, click the "New Report" button to create a new dosimetry report and begin dosimeter measurements.



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- 2 The next screen will prompt the user to select the appropriate information for this new report:
- Select one of the pre-configured 'Report Type' options from the dropdown menu. In this example, the user selects "Ebeam Test Report" to choose the report for measuring dosimeters for an e-beam test.

- Select a 'Pathway' (Irradiation pathway).
- Select a 'Batch' (dosimeter batch).
- Enter a new, unique Report ID to name the new dosimetry report.
- Click "Save Changes" button.

- 3 The next screen will prompt the user to enter the appropriate dosimetry process information into the report headers (as configured by the Admin). In this example, the Admin has configured three report header fields – PCN#, Process Date, and Pit/Tower Beam. The user types in the PCN#, selects a process date from the pop-up calendar, and types 'Pit Beam'.

- 4 Click "Save Changes" and the new report is created, and the user will be able to begin dosimeter measurements.

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## NOTE

Fields are outlined in red if the Admin configured these fields as "required".

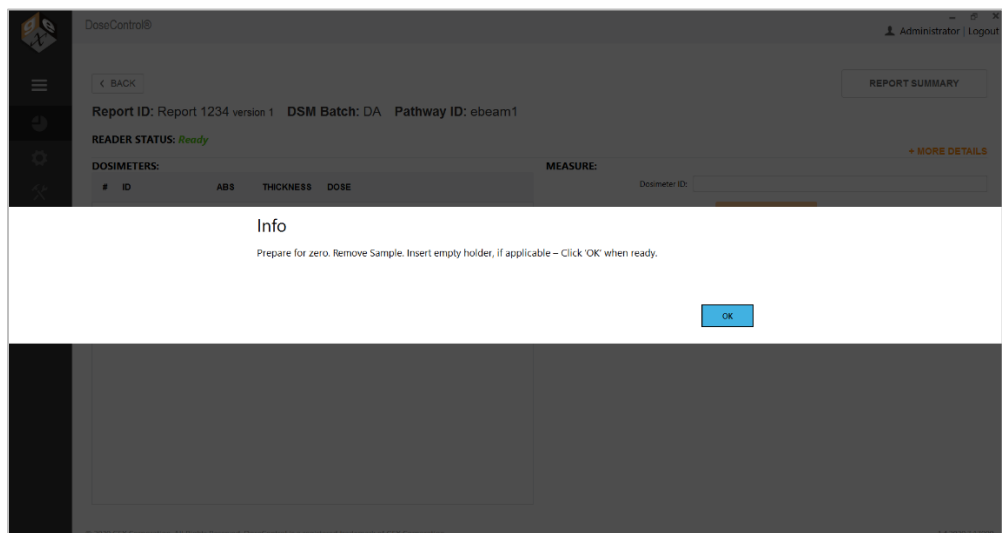
Report ID: Wedge test 02June2020 version 1 DSM Batch: DA Pathway ID: ebeam1

PCN#

Process Date

*Report header fields outlined in red are required.*


- 5 Once the report is created, DoseControl will open the dosimeter measurement screen and prompt the user to prepare to zero '0' the spectrophotometer and begin measurements.



- 6 The dosimeter measurement screen will then open and is now ready for the user to perform measurements. Reader Status should say *Ready*.

## Process for Using Existing Dosimetry Reports

### Open an Existing Report

- 1 Go to the DoseControl home screen by clicking the  icon on the toolbar.
- 2 Click a Report ID to open an existing dosimetry report.

SEARCH REPORTS

Include all versions

REPORT ID	VERSION	STATUS	DATE	TIME	LAST EDITED BY	PATHWAY	BATCH
<a href="#">Wedge test 02June2020</a>	1	Incomplete	6/3/2020	3:02 PM	Administrator	ebeam1	DA
<a href="#">Report Name 1234</a>	2	Incomplete	6/3/2020	3:01 PM	Administrator	ebeam1	DA

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- 3 To quickly find an existing report, use the Search bar to find an existing report by Report ID, Dosimeter ID. See [Search Reports](#) section for details.
- 4 The software will prompt the user to zero '0' the spectrophotometer. Click 'OK' to zero the reader. You can begin measuring dosimeters.

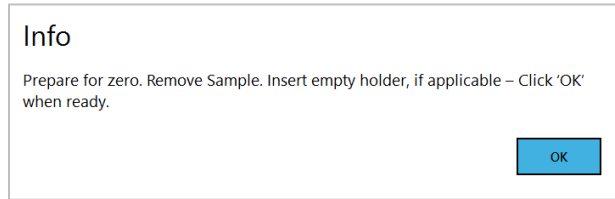
### Create a New Version of a Report

After a report is processed and complete, you must create a version of the report to add additional measurements or make any changes to the report. To create a new version, follow the instructions given in [Create a New Version of a Report](#) in the Report Summary Screen section.

## Process for Dosimeter Measurement

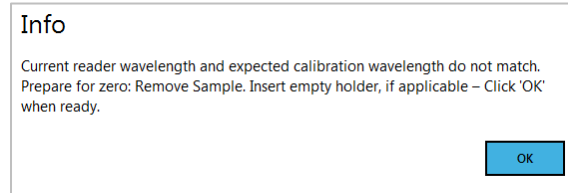
### Measuring Dosimeters

- 1 Upon entry to the measure screen, follow the on-screen prompts to remove dosimeter samples from the sample compartment and prepare for zero (see image below).



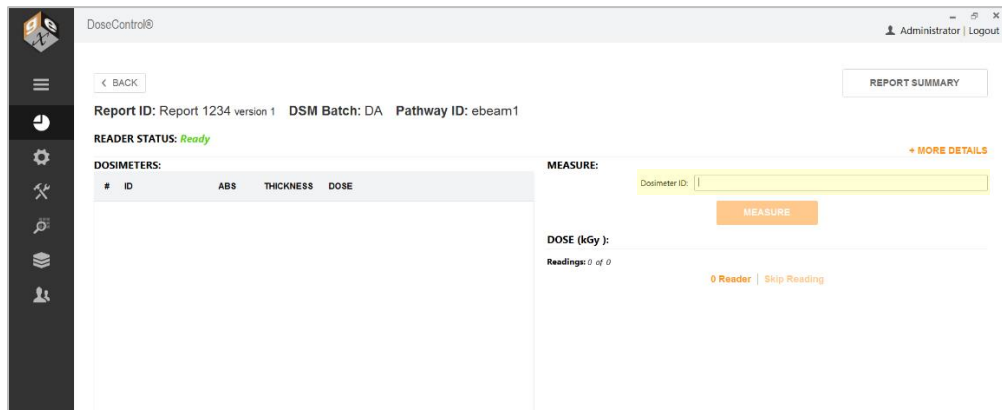
#### NOTE

The software verifies the measurement wavelength setting of the spectrophotometer before every measurement, and ensure it matches the calibration. If it is not correct, the software will inform the user and then set the instrument to the correct wavelength and force the user to zero the spectrophotometer before making a measurement.



Example notification

- 2 The cursor defaults to the Dosimeter ID field and is ready to accept a manually typed or barcode scanned value.



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- To measure the dosimeter's absorbance value, select the 'Measure' button.

**MEASURE:**

Dosimeter ID:



- The dosimeter is measured and the measurement information is shown in the Dosimeters list section of the screen, displaying the dosimeter ID, the measured absorbance, the dosimeter thickness (pre-configured in 'Batches' by the Admin), and the calculated dose.

#	ID	ABS	THICKNESS	DOSE
1	DA_123456	0.507	0.0174 mm	31.2 uGy

**NOTE**

The 'thickness' value is the average thickness value of the dosimeter batch from the calibration configuration. The ABS 'absorbance' value is the value measured by the spectrophotometer. If the absorbance count is 2 or more (e.g. A and B dosimeter) the absorbance and thickness are the average of both replicates.

**NOTE**

The 'dose' is calculated by the software. See [Measurement Screen](#) section for details.

- Enter a 'DSM Position' (dosimeter position, such as reference) and 'Tote ID' (the tote, carrier number) if you desire. Click the "Save Changes" button. This information will be saved with the Dosimeter ID measurement information.

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- Repeat the measurement process for all required dosimeters. The measurement list will update with each action.

Report ID: 1234 Sample Report version 1 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: None

Model Info: Gen30  
Serial #: 9A1U102012  
Wavelength (nm): 552  
Spectral Bandwidth: 1 small aperture / fiber

Avg. Thickness (mm): 0.0174  
Avg. Background ABS: 0.000  
Calibration: DA cal G30  
Calibration Date: 5/4/2020 12:00 AM

Min Dose: 2.1  
Max Dose: 60.0

**DOSIMETERS:**

#	ID	ABS	THICKNESS	DOSE
1	001	0.300	0.0174 mm	30.6 kGy
2	002	0.252	0.0174 mm	13.4 kGy
3	003	0.510	0.0174 mm	31.4 kGy
4	004	0.494	0.0174 mm	30.2 kGy
5	005	0.485	0.0174 mm	29.5 kGy

**MEASURE:**

Dosimeter ID:

DOSE (kGy):

Readings: 1 of 5

### How to re-measure (re-read) a Dosimeter

- To re-read a dosimeter, select the "REREAD" button.

Report ID: Report Name 1234 version 1 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: Ready

Model Info: MCEK  
Serial #: 09765  
Wavelength (nm): 552  
Spectral Bandwidth: 1 small aperture / fiber

Avg. Thickness (mm): 0.0174  
Avg. Background ABS: 0.000  
Calibration: DA mock reader  
Calibration Date: 5/22/2020 8:19 AM

Min Dose: 2.1  
Max Dose: 60.0

**DOSIMETERS:**

#	ID	ABS	THICKNESS	DOSE
1	DA_123456	0.307	0.0174 mm	31.2 kGy

**MEASURE:**

Dosimeter ID: DA\_123456

DSM Position: 01

Tube ID: 03

DOSE (kGy): 31.2

**A** 0.507

Thickness: 0.0174 mm

Readings: 1 of 1

- Next, choose a reason for the re-read from the dropdown menu. The Admin has pre-configured how re-reads are performed (simple measurement replacement of the original or statistical re-read process – see [Reread Configuration](#) for details). The Admin also configured a list of allowed reasons to perform a re-read, and if a comment is required.

DOSE (kGy): 31.2

**A**

Select a reason

- dirty dosimeter
- dose verification
- dirt on dosimeter
- not heat treated

Readings: 1 of 3

- Click "Measure" to re-read the dosimeter:

DOSE (kGy): 31.2

**A**

dirt on dosimeter

Thickness: 0.0174

Readings: 1 of 3

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- 10 In this example of a simple reread, the new measurement replaces the old value and is seen in the dosimeter's information. A re-read symbol indicates the dosimeter has been re-measured:

Report ID: Report Name 1234 version 1 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: Ready

Model Info: MDCX Serial #: 09765 Avg. Thickness (mm): 0.0174 Min Dose: 2.1  
 Wavelength (nm): 552 Avg. Background ABS: 0.000 Max Dose: 60.0  
 Spectral Bandwidth: 1 small aperture / fiber Calibration: DA mock reader  
 Calibration Date: 5/22/2020 8:19 AM

#	ID	ABS	THICKNESS	DOSE
1	DA_123456	0.507	0.0174 mm	31.2 kGy

MEASURE: Dosimeter ID: DA\_123456  
 DSM Position: rnf  
 Note ID: 23

DOSE (kGy): 31.2

**A 0.507**

Readings: 1 of 1

0 Reader | Skip Reading

### How to Skip a Dosimeter Measurement

- 11 To skip a dosimeter reading, scan or enter the Dosimeter ID and then click the “Skip Reading” button. Enter a reason when prompted and click “OK”. The skipped dosimeter ID will be recorded, and the absorbance will note “NO DOSI” with a dose of “N/A”. See screenshots below.

Report ID: Report Name 1234 version 2 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: Ready

Model Info: MDCX Serial #: 09765 Avg. Thickness (mm): 0.0174 Min Dose: 2.1  
 Wavelength (nm): 552 Avg. Background ABS: 0.000 Max Dose: 60.0  
 Spectral Bandwidth: 1 small aperture / fiber Calibration: DA mock reader  
 Calibration Date: 5/22/2020 8:19 AM

#	ID	ABS	THICKNESS	DOSE
1	DA_123456	0.507	0.0174 mm	31.2 kGy
2	DA_123457	0.507	0.0174 mm	31.2 kGy

MEASURE: Dosimeter ID: DA\_123457

DOSE (kGy): 31.2

Readings: 2 of 2

0 Reader | Skip Reading

User input required

Please provide the reason for skipping the measure.

Lost dosimeter

OK Cancel

Report ID: Report Name 1234 version 2 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: Ready

Model Info: MDCX Serial #: 09765 Avg. Thickness (mm): 0.0174 Min Dose: 2.1  
 Wavelength (nm): 552 Avg. Background ABS: 0.000 Max Dose: 60.0  
 Spectral Bandwidth: 1 small aperture / fiber Calibration: DA mock reader  
 Calibration Date: 5/22/2020 8:19 AM

#	ID	ABS	THICKNESS	DOSE
1	DA_123456	0.507	0.0174 mm	31.2 kGy
2	DA_123457	0.507	0.0174 mm	31.2 kGy
3	DA_123459	NO DOSI	0.0174 mm	N/A

MEASURE: Dosimeter ID: DA\_123459  
 DSM Position:   
 Note ID:   
 MEASURE

DOSE (kGy): N/A

**A NO DOSI**

Readings: 3 of 3

0 Reader | Skip Reading

## Report Summary Screen

### Report Summary Screen Overview

The Report Summary provides a view of the overall report information including some key features that are not available on the 'Measure' screen. View a summary of the dosimetry report at any time by clicking the “Report Summary” button in the upper right of the screen:

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Report ID: Report Name 1234 version 1 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: Ready

**DOSIMETERS:**

#	ID	ABS	THICKNESS	DOSE
1	DA_123456	0.507	0.0174 mm	31.2 kGy
2	DA_123457	0.507	0.0174 mm	31.2 kGy

**MEASURE:**

Dosimeter ID: DA\_123457  
 DSM Position:   
 Tote ID:

**DOSE (kGy):** 31.2

**A 0.507**

Thickness: 0.0174  **SAVE**

Readings: 2 of 2

0 Reader | Skip Reading

**REPORT SUMMARY**

[+ MORE DETAILS](#)

**Report Summary sections:**

- A. Results** – Lists the overall minimum and maximum measured doses as well as the minimum and maximum dose specifications, if configured (see 'Results' below for details)
- B. Report Information** – A listing of the Report Header information for the report. Use the 'Edit Headers' button at the top-right of the summary screen to edit the data in these fields at any time.
- C. Readings** – Same as the dosimeter list from the 'Measure' screen.
- D. Report Summary Statistics** – Lists the statistics for the report
  - Average measured dose
  - Measured dose standard deviation
  - Measured dose C.V. %
  - Minimum measured
  - Maximum measured
- E. Comments** – All comments are collected here. Skipped readings will be noted here and are not editable here. General report comments can be entered and saved here.

DoseControl® Administrator |

Report ID: Report Name 1234 version 2 DSM Batch: DA Pathway ID: ebeam1

**A RESULTS:**

Overall Minimum Dose (kGy): 31.2  
 Overall Maximum Dose (kGy): 31.2

**B REPORT INFORMATION**

PCNR: 1234AB  
 Process Date: 6/9/2020  
 Pit or Tower Beam: Pit

**C READINGS**

#	ID	TOTE	POSITION	ABS	THICKNESS	RESPONSE	DOSE
1	DA_123456	23	ref upper	0.507	0.0174 mm	29.138	31.2 kGy
2	DA_123457	24	ref lower	0.507	0.0174 mm	29.138	31.2 kGy

**D DOSE SUMMARY STATISTICS**

Average Measured Dose: 31.2 kGy  
 Measured Dose St. Dev: 0.0 kGy  
 Measured Dose C.V. %: 0.0%  
 Minimum Measured: 31.2 kGy  
 Maximum Measured: 31.2 kGy

**E COMMENTS**

**PROCESS REPORT** **VERSION REPORT**

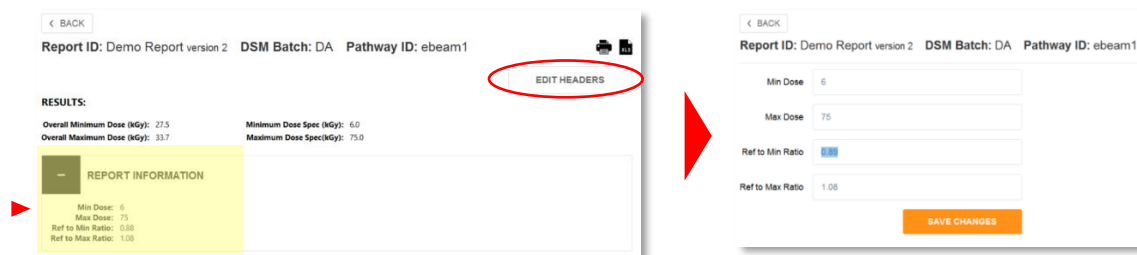
© 2021 GEX Corporation. All Rights Reserved. DoseControl is a registered trademark of GEX Corporation. 1.5.2020.11

Report Summary screen

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## Edit Report Information and Report Headers

**Edit Headers:** Click the “Edit Headers” button to edit the Report Information for the report. Add or change the values in the report header fields, then click “Save Changes”:



*Edit Report header information*



## Delete and Edit a dosimeter reading

**Delete a dosimeter reading:** Click the trash can icon next to a dosimeter ID  DA\_123456 and enter a comment when prompted.

User input required

Provide reason for deleting the Dosimeter ID from this report.

**Edit a dosimeter reading:** Click the pencil icon next to a dosimeter ID   DA\_123456 and change the dosimeter ID information. Click the checkmark icon to save the edit. Enter a comment when prompted.

User input required

Provide reason for editing the Dosimeter ID.

*Edit a dosimeter reading*

### NOTE

The Admin can control the deleting and editing of dosimeter ID's through User Permissions. Only users with the “edit dosimeter IDs” role can perform this action. See [Configure User Roles and Permissions](#).

## Add a Comment to a Report

**Add a comment to a report:** To add a comment to a report, expand the Comments area and type a comment. Click Update Comment to save:

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*Add a comment*

## Process a Complete Report

**Process a Complete Report:** To process a completed report, click the “Process Report” button at the bottom of the Report Summary screen. This saves a final version of the report and changes the report status from Incomplete to Complete.

*Process Report button*

REPORT ID	VERSION	STATUS	DATE	TIME	LAST EDITED BY	PATHWAY	BATCH
Report_Name_1234	1	Complete	6/3/2020	2:58 PM	Administrator	ebeam1	DA
Wedge_test_02June2020	1	Incomplete	6/3/2020	10:06 AM	Administrator	ebeam1	DA
Wedge_test_ABC	1	Incomplete	6/3/2020	10:05 AM	Administrator	ebeam1	DA
87rev2	1	Incomplete	6/1/2020	4:11 PM	Administrator	ebeam1	DA
demo	1	Incomplete	5/29/2020	2:38 PM	Administrator	ebeam1	DA
786	1	Incomplete	5/29/2020	2:26 PM	Administrator	ebeam1	DA

*Processed report shows a status of 'Complete' in the Report list screen*

## Create a New Version of a Report

**Version a report:** Click the “Version Report” button on lower right of the Report Summary screen. This will create the next iterative version number for the report. Make changes to the report’s header information, if necessary. Click “Save Changes”. The software will then open the active measurement screen, with the new version of the report open.

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Report ID: Report 1234 version 1 DSM Batch: DA Pathway ID: ebeam1

RESULTS:

Overall Minimum Dose (kGy): 17.3  
Overall Maximum Dose (kGy): 17.3

+ REPORT INFORMATION

+ READINGS

+ COMMENTS

PROCESS REPORT

VERSION REPORT

Report ID: Report 1234 version 2 DSM Batch: DA Pathway ID: ebeam1

PCN#: 123AWR-1

Process Date: 8/13/2020

Pit or Tower Beam: pit

SAVE CHANGES

Make any needed changes to the new version of a report.

< BACK

REPORT SUMMARY

Report ID: Report Name 1234 version 2 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: Ready

+ MORE DETAILS

DOSIMETERS:

#	ID	ABS	THICKNESS	DOSE
1	DA_123458	0.507	0.0174 mm	31.2 kGy
2	DA_123457	0.507	0.0174 mm	31.2 kGy

MEASURE:

Dosimeter ID: DA\_123458

DSM Position: ref

Tote ID: 23

MEASURE

DOSE (kGy): 31.2

**A 0.507**

Thickness: 0.0174

REREAD

SAVE

Readings: 1 of 2

0 Reader | Skip Reading

Make dosimeter measurements or re-reads as necessary in Version 2 of a report.

SEARCH REPORTS

Report 1234

NEW REPORT

Include all versions

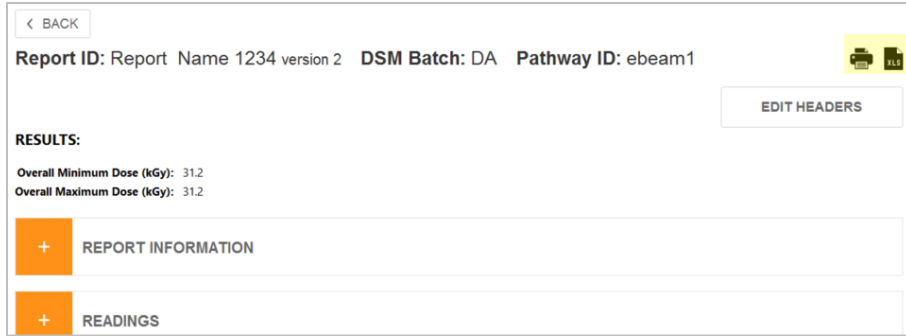
REPORT ID	VERSION	STATUS	DATE	TIME	LAST EDITED BY	PATHWAY	BATCH
Report 1234	2	Incomplete	8/13/2020	1:19 PM	Operator	ebeam1	DA
Report 1234	1	Complete	8/13/2020	1:14 PM	Operator	ebeam1	DA

Version 2 and Version 1 visible on the main reports screen.


## Export a Dosimetry Report to MS Excel or Print to PDF

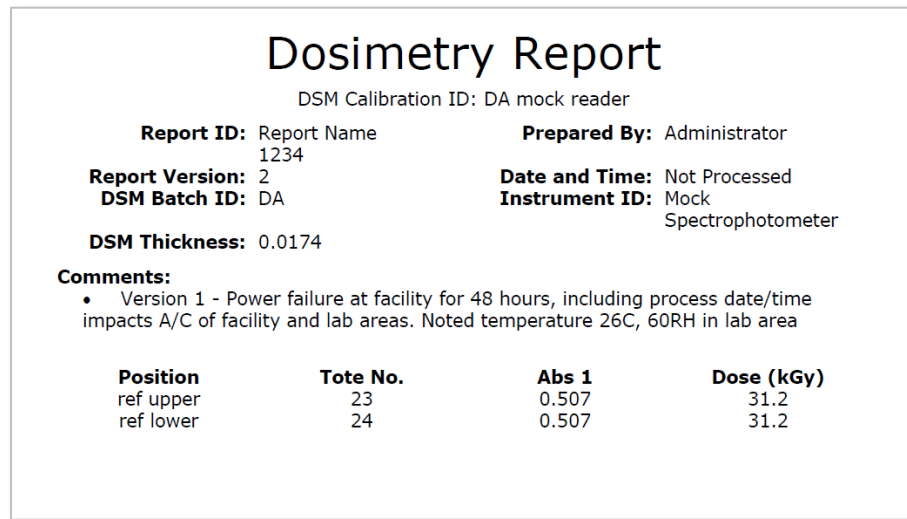
**PDF Reports:** To export or print a secure PDF of the dosimetry report, click the printer icon in the upper right of the Report Summary screen. This will create a PDF of the report with the content, data, and design format configured by the Admin. The PDF is secure and cannot be altered. You can save, download or print the PDF. For Admin configuration instructions, see How to Set up a new Report Type and configure the report content section for details.

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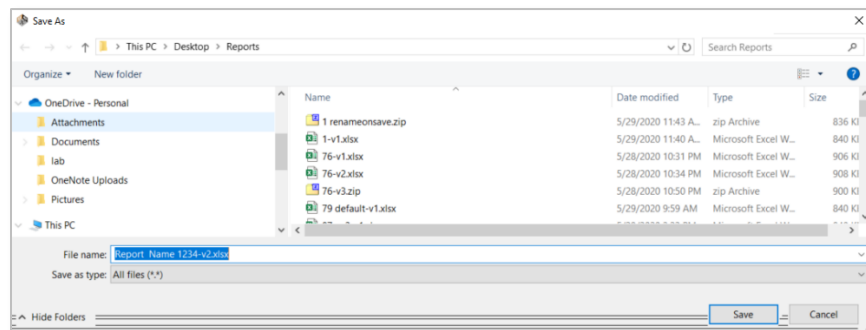
*Print to PDF and Export to Microsoft Excel icons*

To export the dosimetry report to PDF format (secure PDF), click the printer icon  in the upper right of the Report Summary screen. This will create a PDF document with the content, data and design format configured by the Admin. You can print the PDF or save to any location. For Admin configuration instructions, see How to use PDF reports in DoseControl section for details.



*Sample PDF report*

To export the dosimetry report to MS Excel (\*.xlsx), click the XLS document icon  in the upper right of the Report Summary screen. This will create an Excel document of the report with the content, data, and design format configured by the Admin. You can save the report to any location, or print.



*Export to MS Excel file*

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DOSIMETRY REPORT				
PCN#: 1234AB	Dosimetry Report ID: Report Name 1234			
Process Spec:	Min Dose in Process: 31.2			
Process Date: Pit	Max Dose in Process: 31.2			
Technician: Administrator	Dmin/Ref Ratio: 0			
Dosimetry Date: 03-Jun-2020	Dmax/Ref Ratio: 0			
Instrument S/N: 09765	Reviewed by:			
Dosimeter Batch: DA	Average Thickness (t): 0.0174	Wavelength (nm): 552		
Calibration ID: DA mock read	Initial Average Absorbance (Ao): 0.000			
Dosimeter Irradiated Response				
Dosimeter ID	Position	Abs.	(Ai - Ae) / t	Dose (kGy)
DA__123458	ref upper	0.507	29.138	31.2
DA__123457	ref lower	0.507	29.138	31.2
0000000	0	0.000	0.000	0.0
0000000	0	0.000	0.000	0.0

Sample MS Excel report

## Searching dosimetry reports

Use the Search bar on the main reports screen to quickly find information. Search by report ID, dosimeter ID and other keywords. Filter by pathway and versions. Default list shows current versions of reports. Tick the "Include all versions" to display all versions.

SEARCH REPORTS								
DA_78988							ebeam1	NEW REPORT
<input checked="" type="checkbox"/>	Include all versions							
REPORT ID	VERSION	STATUS	DATE	TIME	LAST EDITED BY	PATHWAY	BATCH	
Wedge.test.ABC	1	Incomplete	6/3/2020	6:28 PM	Administrator	ebeam1	DA	
Report Name 1234	2	Incomplete	6/3/2020	3:10 PM	Administrator	ebeam1	DA	
02test	1	Complete	6/3/2020	3:04 PM	Administrator	ebeam1	DA	
Wedge.test.02June2020	1	Incomplete	6/3/2020	3:02 PM	Administrator	ebeam1	DA	
detest	1	Incomplete	5/29/2020	2:38 PM	Administrator	ebeam1	DA	
Z86	1	Incomplete	5/29/2020	2:35 PM	Administrator	ebeam1	DA	
not.informity.upload	2	Complete	5/29/2020	2:33 PM	Administrator	ebeam1	DA	
not.informity.upload	1	Incomplete	5/29/2020	1:15 PM	Administrator	ebeam1	DA	
uniform.filename	1	Incomplete	5/29/2020	1:07 PM	Administrator	ebeam1	DA	
not.informity	1	Incomplete	5/29/2020	1:05 PM	Administrator	ebeam1	DA	

SEARCH REPORTS							
DA_78988							ebeam1
<input checked="" type="checkbox"/>	Include all versions						
REPORT ID	VERSION	STATUS	DATE	TIME	LAST EDITED BY	PATHWAY	BATCH
Wedge.test.ABC	1	Incomplete	6/3/2020	6:28 PM	Administrator	ebeam1	DA

Search reports

## Alerts for Measurements Outside the Min/Max Range

**Outside the product specification min/max dose range:** If a dosimeter measurement is outside the range of the product specification's overall minimum or maximum dose, DoseControl will highlight the out of range dose in **red** color, place an alert icon **▲** next to the result, and report an alert statement. These alerts are present on both the measurement screen and the report summary screen.

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**THE OVERALL MINIMUM DOSE IS LESS THAN THE SPECIFICATION REQUIRES.**

**RESULTS:**

Overall Minimum Dose (kGy): 1.8      Minimum Dose Spec (kGy): 10.0  
 Overall Maximum Dose (kGy): 31.7      Maximum Dose Spec(kGy): 45.0

**REPORT INFORMATION**

Min Dose: 10  
 Max Dose: 45  
 Ref to Min Ratio: 0.87  
 Ref to Max Ratio: 1.01

**READINGS**

#	ID	TOTE	POSITION	ABS	THICKNESS	RESPONSE	DOSE	CALC. MIN DOSE (kGy)	CALC. MAX DOSE (kGy)
1	001	55	13	0.500	0.0174 mm	28.736	30.6 kGy	26.6	30.9
2	002	65	2	0.252	0.0174 mm	14.483	13.4 kGy	11.7	13.5
3	003	23	1	0.510	0.0174 mm	29.310	31.4 kGy	27.3	31.7
4	004	55	2	0.494	0.0174 mm	28.391	30.2 kGy	26.3	30.5
5	005	45	5	0.485	0.0174 mm	27.874	29.5 kGy	25.7	29.8
6	006	47	2	0.073	0.0174 mm	4.195	2.1 kGy	1.8 ▲	2.1 ▲
7	007	11	4	0.328	0.0174 mm	18.851	18.5 kGy	16.1	18.7

**COMMENTS**

Dosimeter measurement that is below the minimum dose of the product specification, as shown on the Report Summary screen.

**Outside the calibration min/max dose range:** If a dosimeter measurement is outside the dose range of the batch calibration's minimum and maximum, DoseControl will also highlight the out of range dose in red and place an alert icon ▲ next to the result. These alerts are present on both the measurement screen and the report summary screen.

REPORT SUMMARY

Report ID: 567 Report Sample DEF version 3 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: None

Model Info: Gen30      Avg. Thickness (mm): 0.0174      Min Dose: 2.1  
 Serial #: 9A1U102012      Avg. Background ABS: 0.000      Max Dose: 60.0  
 Wavelength (nm): 552      Calibration: DA cal G30  
 Spectral Bandwidth: 1 small aperture / fiber      Calibration Date: 5/4/2020 12:00 AM

**DOSIMETERS:**

#	ID	ABS	THICKNESS	DOSE
1	DA_7642985A	0.374	0.0174 mm	21.6 kGy
2	DA_7642986A	0.364	0.0174 mm	20.9 kGy
3	DA_7642987A	0.490	0.0174 mm	29.9 kGy
4	DA_7642988A	0.588	0.0174 mm	37.3 kGy
5	DA_7642989A	0.061	0.0174 mm	1.4 kGy ▲
6	DA_7642990A	0.471	0.0174 mm	28.5 kGy
7	DA_7642991A	0.906	0.0174 mm	65.5 kGy ▲
8	DA_7642992A	0.496	0.0174 mm	30.3 kGy
9	DA_7642993A	0.599	0.0174 mm	38.2 kGy
10	DA_7642994A	0.453	0.0174 mm	27.2 kGy
11	DA_7642995A	0.487	0.0174 mm	29.7 kGy
12	DA_7642996A	0.049	0.0174 mm	0.7 kGy ▲

**MEASURE:**

Dosimeter ID:

**DOSE (kGy):**

Readings: 1 of 12

0 Reader | Skip Reading

[- LESS DETAILS](#)

Dosimeter measurements that are outside the range of the batch calibration Min Dose/Max Dose, as shown on the Measurement screen.

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## Using the Audit Trail and Audit Reports Feature

The Audit Trail feature in DoseControl allows the users to search, filter and view the historical record of events from the database. The user can also compile an audit report, and save and print the report. For complete description, see *Audit Trail and Audit Reports* in the DoseControl System Description section.

Overview of the Audit Trail Search screen:

**Filter settings:**

- Category
- User Name
- Start/End date
- Batch
- Pathway
- Reader ID
- Report ID
- Dosimeter ID

Create PDF of filtered audit trail results (save or print)

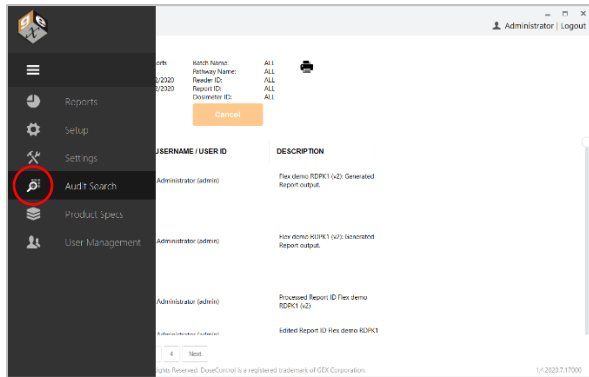
**Filtered Audit Trail Results:**  
List of all events recorded, filtered by the settings.  
For each event:

- Date & Timestamp
- Event Category
- Description

### How to Search and Filter the Audit Trail

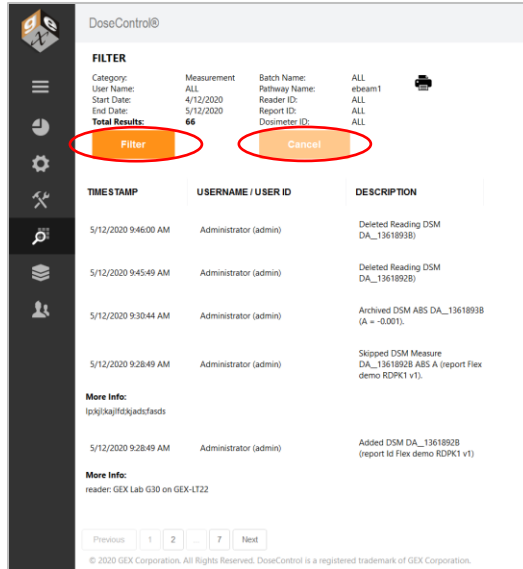
To search and filter the audit trail:

- 1 Select the magnifying glass icon on the tool bar to view the Audit Trail Search screen.



- 2 The Audit Trail Search screen will load with the results of the last search performed on the system; the results are not displayed real-time. The user will need to perform a new query by pressing the "Filter" button.

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### IMPORTANT

Press the 'Cancel' button to cancel a search, if needed, during the search function to stop the search. If the filter is too broad and includes an excessively large data quantity, it can cause an extended search time as DoseControl compiles all the results from the database (or may lockup the application). Simply click 'Cancel' to stop the search and set the filter to include a narrower search.

- The Filter screen will open. Select the filtering criteria and then press the "Save" button. To return to the Audit Search Results screen, press the "Cancel" button.

#### AUDIT SEARCH FILTER

**Category:** Measurement

**User Name:** ALL

**Batch:** DA

**Pathway:** ebeam1

**Reader:** ALL

**Report Id:** ALL

**Dosimeter Id:** ALL

**Start Date:** 4/12/2020  **End Date:** 5/12/2020

SAVE

CANCEL

*Filter Screen for Audit Trail*

**Searches of the audit trail can be filtered by the following:**

- Date range
- Event Type:
  - User Access events (e.g. Login, logout, failed login)
  - Configuration events (e.g. add, edit, or delete dosimeter batch calibrations)
  - Reports (e.g. create, process, version)

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- Measurement (e.g. measure, remeasure)
- Instrument zeroing
- Performance Verification (start, end, pass/fail)
- Irradiation Pathway ID
- Dosimeter Batch ID
- Measurement Instrument ID
- Dosimeter ID
- Report ID

### Save/Print PDF Audit Trail Report

Audit trail results can be generated into a PDF Report by pressing the PDF button on the screen. The PDF Report contains all same information that is displayed in the audit trail filter results on the screen.



### Example Audit Trail Report PDF file:

GEX DoseControl Software Audit Trail Report			
<b>Audit Categories:</b>	UserAccess	<b>Start</b>	<b>End</b>
<b>User Name(s):</b>	All	<b>Date Range:</b> 09/01/2019	09/13/2019
		6:00:00 AM	6:00:00 AM
<b>Dosimeter Batch(s):</b>	All	<b>Report ID(s)</b>	All
<b>Irradiation Pathway(s):</b>	All	<b>Dosimeter ID(s)</b>	All
<b>Reader(s):</b>	All		
<b>Total records:</b>	74		

Date/Time	User Name	Event Description
12-Sep-2019 11:57:58	Administrator (admin)	User logged in; More Info: User logged in as admin via username/password in LDAP interface. Machine user: mpageau
12-Sep-2019 10:40:25	Administrator (admin)	User logged in; More Info: User logged in as admin via username/password in LDAP interface. Machine user: mpageau
12-Sep-2019 10:06:20	Administrator (admin)	User logged in; More Info: User logged in as admin via username/password in LDAP interface. Machine user: mpageau
12-Sep-2019 9:58:00	Administrator (admin)	User logged in; More Info: User logged in as admin via username/password in LDAP interface. Machine user: mpageau
12-Sep-2019 8:50:59	Administrator (admin)	User logged in; More Info: User logged in as admin via username/password in LDAP interface. Machine user: mpageau
12-Sep-2019 8:43:52	Administrator (admin)	User logged in; More Info: User logged in as admin via username/password in LDAP interface. Machine user: mpageau
12-Sep-2019 6:28:51	Administrator (admin)	User logged out
12-Sep-2019 6:26:46	Administrator (admin)	User logged in; More Info: User logged in as admin via username/password in LDAP interface. Machine user: mpageau
12-Sep-2019 5:37:55	Mike Pageau	User logged in

### IMPORTANT

The results of the audit trail search (filter) are rendered to PDF by the application. For a large data set this can take an extensive number of minutes to complete. The application allows a maximum of 10,000 records to be printed to PDF in a single request. Therefore, if your "Total Results" is greater than 10,000 you will need to refine the search until that number is less than 10,000 for the PDF to render. DoseControl will alert the user if the record number exceeds this capacity.

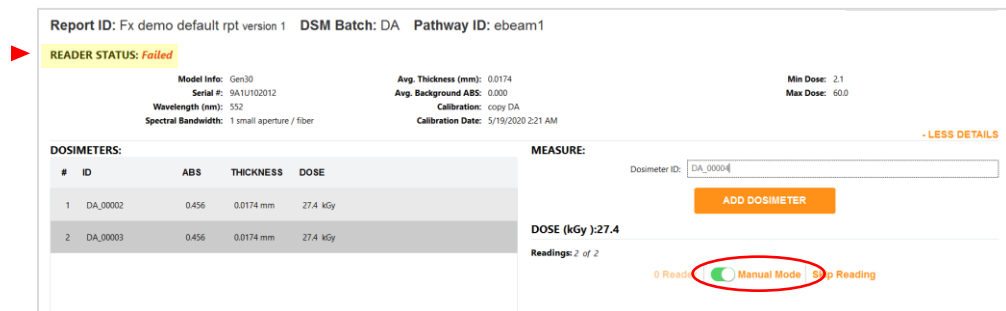
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## Using DoseControl Software in Manual Mode

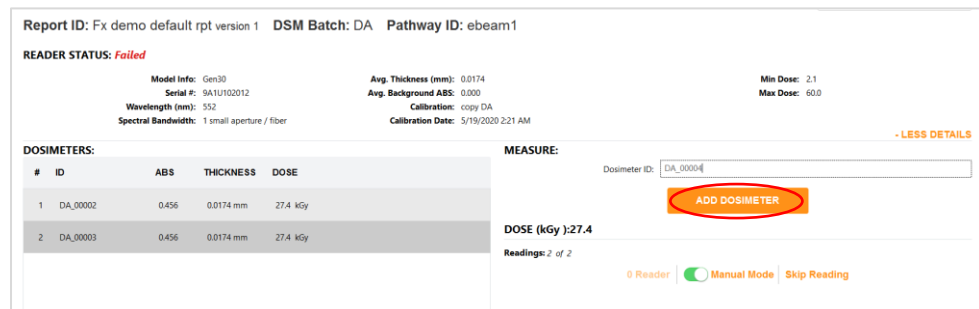
Manual Mode allows the user to record dosimeter measurements in the DoseControl software when the configured reader (spectrophotometer) is disconnected from the system. The user measures the dosimeter in the reader and then types the absorbance value in the DoseControl measurement screen; the absorbance value is recorded in the dosimetry report just as an automatic measurement would be. This feature can be very helpful when validating the dose output of the software after configuring a calibration for a dosimeter batch, or if some event occurs that prevents the spectrophotometer from connecting to the software.

How to use Manual Mode:

- 1 If the configured reader for the workstation is not connected or is powered off, then the Manual Mode button will appear on the measurement screen. The Reader Status will display **Failed** because the reader is disconnected. Toggle Manual Mode to the “on” position. The toggle switch will have a green color to indicate Manual Mode is operating.



- 2 Type the dosimeter ID into the Dosimeter ID field on the measurement screen. Click “Add Dosimeter” button. You will see the dosimeter’s ID added to the Dosimeters list without an absorbance value, thickness or calculated dose:



- 3 Using the reader, measure the dosimeter’s absorbance value and note the value displayed on the reader’s screen (GENESYS 20 or 30) or in the Thermo INSIGHT software (Evolution). Ensure the measurement wavelength is correct for the type of dosimeter being measured. Use 552nm for B3 dosimeters.



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4 Type the measured absorbance value into the DoseControl. Click the “Save” button.

Report ID: Fx demo default rpt version 1 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: **Failed**

Model Info: Gen30 Avg. Thickness (mm): 0.0174 Min Dose: 2.1  
 Serial #: 9A1U102012 Avg. Background ABS: 0.000 Max Dose: 60.0  
 Wavelength (nm): 552 Calibration: copy DA  
 Spectral Bandwidth: 1 small aperture / fiber Calibration Date: 5/19/2020 2:21 AM

- LESS DETAILS

#	ID	ABS	THICKNESS	DOSE
1	DA_00002	0.456	0.0174 mm	27.4 kGy
2	DA_00003	0.456	0.0174 mm	27.4 kGy
3	DA_00004	N/A	mm	N/A

MEASURE:

Dosimeter ID: DA\_00004  
 DSM Position:  
 Tote ID:

DOSE (kGy): **N/A**

**A** 0.445

Thickness:

Readings: 3 of 3

0 Reader  Manual Mode

5 The thickness value automatically populates (this is the thickness from the calibration) and the software calculates the dose. You will see the dosimeter’s absorbance value, thickness value, and dose displayed in the dosimeter list.

Report ID: Fx demo default rpt version 1 DSM Batch: DA Pathway ID: ebeam1

READER STATUS: **Failed**

Model Info: Gen30 Avg. Thickness (mm): 0.0174 Min Dose: 2.1  
 Serial #: 9A1U102012 Avg. Background ABS: 0.000 Max Dose: 60.0  
 Wavelength (nm): 552 Calibration: copy DA  
 Spectral Bandwidth: 1 small aperture / fiber Calibration Date: 5/19/2020 2:21 AM

- LESS DETAILS

#	ID	ABS	THICKNESS	DOSE
1	DA_00002	0.456	0.0174 mm	27.4 kGy
2	DA_00003	0.456	0.0174 mm	27.4 kGy
3	DA_00004	0.445	0.0174 mm	26.6 kGy

MEASURE:

Dosimeter ID: DA\_00004  
 DSM Position:  
 Tote ID:

DOSE (kGy): **26.6**

**A** 0.445

Thickness: 0.0174

Readings: 3 of 3

0 Reader  Manual Mode

**NOTE**

The Admin must enable the Manual Mode to allow use of this feature. See Manual Mode in the [Minor Features Configuration](#) section.

**NOTE**

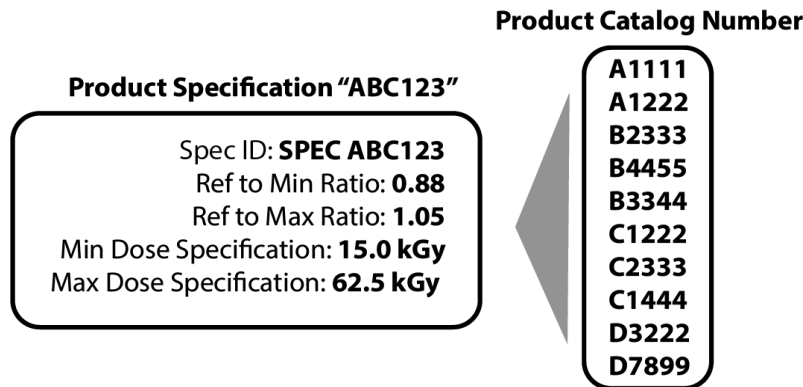
Any entry done in Manual Mode is flagged as ‘manual’ in the database to distinguish it from automatic measurements.

## 11 Product Specification Module (Optional module)

### Product Specification Module Overview

The Product Specifications Module can be purchased separately for a one-time fee. This module allows you to store dosimetry specifications (such as min/max required dose, Dref:Dmin, Dref: Dmax) for multiple products, so that a Technician does not have to manually enter the product information and specifications for a new dosimetry report. This reduces the risk of error due to the constant user data entry.

The Admin can assign any number of products to a single dosimetry specification. In DoseControl, the Technician clicks a product's Catalog Number from a dropdown menu and the associated specification will automatically populate the correct fields.

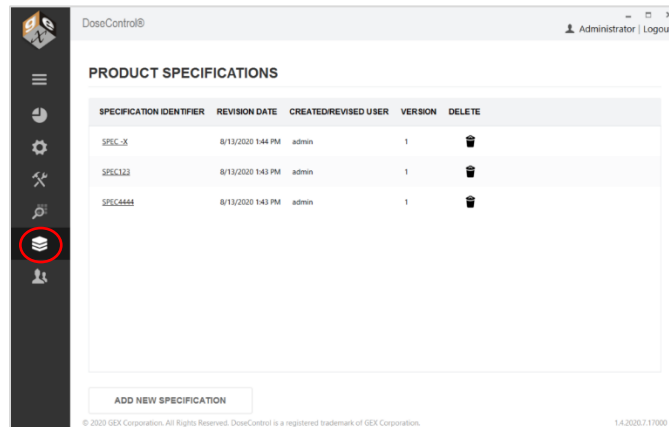


The Admin must setup up a report type to be specifically used with the Product Specifications Module. The Module can be activated for one type of dosimetry report and not activated for another, depending on your needs. For example, a dosimetry report used for routine processing can utilize the product specification functionality and a dosimetry report used for e-beam testing may not.

### Setup and Configure a New Product Specification

#### Product Specification Home Screen

Click the 'stack' icon in the Menu Bar you can view the Product Specifications screen.



Product Specifications home screen

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The Product Specifications home screen lists all the specifications, revision date, the username of the person that created or edited it, and a version number. From this screen, the Admin can either open an existing specification by clicking on the Spec ID or add a new specification by clicking the “Add New Specification” button.

### Add New Product Specification

- 1 Click the “Add New Specification” button on the Product Specification home screen.
- 2 On the pop-up screen, enter the new specification information into each field:

**Specification ID** – Each specification requires a unique ID to identify the information that it contains otherwise the specification cannot be saved.

**Ref to Min Ratio** – Ratio of dose at the position the dosimeter is placed to the minimum dose location in the process load (product). Must be less than the ‘Ref to Max Ratio’.

**Ref to Max Ratio** – Ratio of dose at the position the dosimeter is placed to the maximum dose location in the process load (product). Must be greater than the ‘Ref to Min Ratio’.

**Min Dose Specification** – Value (in kGy) that the product requires. Must be less than the ‘Max Dose Specification’.

**Max Dose Specification** – Value (in kGy) that cannot be exceeded. Must be more than the ‘Min Dose Specification’.

**Catalog Number** – A unique identifier for a specific product. Multiple catalog numbers can be added to a single specification as there are often products with the same ratios and specifications. A Catalog Number can only be associated with one Product Specification.

- 3 Next, add a **Catalog Number** to the list of products to be associated with the Product Specification. Type the catalog number into the field below the list and click the + button (see screenshot below):

- 4 Add a comment to the comment field, if desired.
- 5 Click “Save” to save the new Product Specification. The Product Specification will appear on the home screen list of specifications.

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**NOTE**

The dose and correlation fields must have the correct number of significant digits (2 decimal places).

**Add Product Specification**

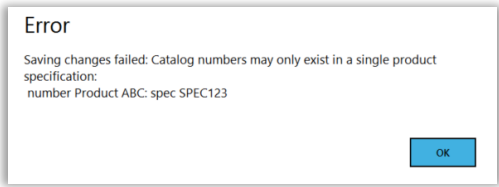
Specification Identifier:

Ref to Min Ratio:  Ref ratios must be numbers with 2 decimal places

Ref to Max Ratio:

**NOTE**

A product Catalog Number can only be associated with one Product Specification. If the Admin attempts to enter the same Catalog Number to another Product Specification, the software will show an error message:



### Create a Dosimetry Report Configuration for Use with the Product Specification Module

The Admin must setup up a report type to be specifically used with the Product Specifications Module.

**NOTE**

For information about report header field configuration, see *Dosimetry Reports: Configuring Report Types and Data Fields* in the Dosimetry Reports section of this manual.

The Admin must create a report type with all the Product Specification “special value” fields configured:

- 1 Create a new report type. (See directions in [Dosimetry Reports: Configuring Report Types and Data Fields](#) in the [Dosimetry Reports](#) section of this manual.)
- 2 For the new report type, add data fields for all the Product Specification requirements:
- 3 For each of these data fields, select the corresponding “Special Value” from the drop down menu. The Special Value fields in the Report Header must be selected for the items in the Product Specification. (If the Correlation Factors Dref:Dmin and Dref:Dmax are not used in the spec or set to “1” they don’t have to be configured in the header.)

FIELD NAME	FIELD TYPE	EXTERNAL ID	LABEL	SPECIAL VALUE	SEQUENCE	REQUIRED	IS EDITABLE	ADDITIONAL VALIDATION	DELETE
RefMin Ratio	Deci	RefMin Ratio	Ref to Min Ratio	Ref to Min	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
RefMax Ratio	Deci	RefMax Ratio	Ref to Max Ratio	Ref to Max	4	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Specification ID	Text		Specification ID		5	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

- Min Dose
- Max Dose
- Ref to Min Ratio
- Ref to Max Ratio
- TS531 Issue
- Catalog Number
- Specification Id

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**IMPORTANT**

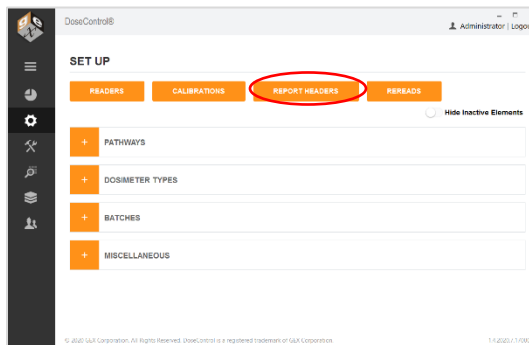
Field Names, Field Type and Special Value must be entered exactly as shown in table below:

FIELD NAME	FIELD TYPE	LABEL	SPECIAL VALUE
Specification ID	Text	Specification ID	Specification Id
Min Spec	Decimal number	Min Spec	Min Dose
Max Spec	Decimal number	Max Spec	Max Dose
Ref:Min Ratio	Decimal number	Ref to Min Ratio	Ref to Min Ratio
Ref:Max Ratio	Decimal number	Ref to Max Ratio	Ref to Max Ratio
Catalog Number	Text	Product ID	Catalog Number

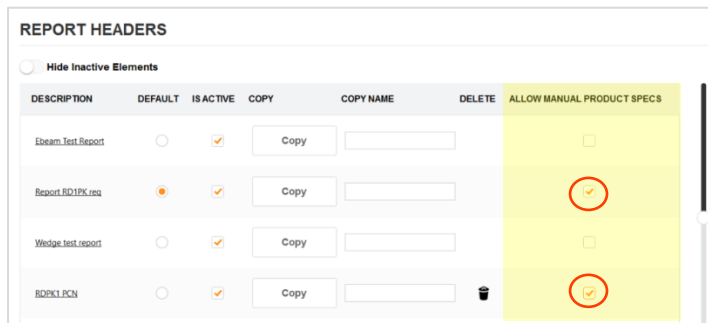
### Activating the Product Specifications Module

The Admin can activate the Product Specification module for use with specific dosimetry reports from the “Report Headers” configuration screen.

- 1 Select the “Setup” icon on the left menu bar. 
- 2 Select the “Report Headers” button



- 3 In the Report Headers list, select “Allow Manual Product Specs” for the report type. This will activate the automatic Product Specification module for use with this report type.



- 4 Select “Required” to make the fields required (the user must enter data in these fields when creating a dosimetry report). Select “Is Editable” to allow user to make changes to the report information. See [Dosimetry Reports: Report Types and Data Fields](#) section for details.

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FIELD NAME	FIELD TYPE	EXTERNAL ID	LABEL	SPECIAL VALUE	SEQUENCE	REQUIRED	IS EDITABLE	ADDITIONAL VALIDATION	DELETE
Min spec	Decr	Min spec	Min Dose	Min Dose	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="text" value="Edit"/>	
Max spec	Decr	Max spec	Max Dose	Max Dose	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="text" value="Edit"/>	

5 Click "Save Changes" to save the report type setup.

## Using the Product Specification module

When a Technician creates a new dosimetry report to measure dosimeters, the Technician will see a drop-down menu to "Find Catalog Number". The Technician can either select the appropriate Catalog Number from the list and the associated product specifications for this Catalog Number will automatically be imported into the report's header. The Catalog Number drop-down also has type-ahead search capabilities, so the Technician can type the first number or letter and the list will filter.

The correct process specification for that Catalog Number will automatically populate the report header fields. See screenshots:

DoseControl™ Administrator | Logout

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Report ID: Test083119-01 version 1 DSM Batch: CH Pathway ID: S11

Find Catalog Number: N/A

Specification ID: N/A

Min Dose (kGy):

Max Dose (kGy):

Dref Dmin:

Dref Dmax:

SAVE CHANGES

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Select a Catalog Number from the drop-down menu

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Report ID: 37231 version 2 DSM Batch: 1137 Pathway ID: Pathway 3

Find Catalog Number: 4082

OrderNumber: 408205, 408206, 408208, 408210, 408213, 408214

RunNumber: 408210

CatalogNumber: 303366

Description: Syringe 60ml LL Tip 1ml

Drop-down menu includes quick-type filter that displays a list of options based on what is typed

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DoseControl™ Administrator | Logout

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**Report ID:** Test083119-01 version 1 **DSM Batch:** CH **Pathway ID:** S11

Find Catalog Number: X65432

Specification ID: X999999

Min Dose (kGy): 15

Max Dose (kGy): 60

Dref.Dmin: 0.85

Dref.Dmax: 1.26

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*Product Specifications automatically populate new dosimetry report setup.*

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## 12 Performance Verification (P.V.) Module (Optional Module)

---

The purpose of the P.V. module is to provide a short-term verification or ‘daily check’ of the reader’s absorbance measurement accuracy. The P.V. module is intended to be used as an additional check to the user’s complete performance verification protocols for the reader. It is not a replacement for a complete performance verification of the reader.

### Requirements for the P.V. Module:

- The P.V. module is for use with the Thermo Evolution spectrophotometer.
- The P.V. module is designed to use a photometric standard from the Thermo Spectronic Standards kit (or other NIST-traceable standards set, certified in absorbance units, for the performance verification of the Thermo Evolution UV-Visible spectrophotometer). The standard should fit into the GEX dosimeter holder for Windose dosimeters (GEX product #P4334).
- The P.V. module requires two users to be setup in the User Manager with username/password.

### Overview of the P.V. Module

- The P.V. module provides performance verification (PV) testing of a single point of photometric accuracy, wavelength accuracy, and wavelength repeatability of the Evolution.
- The software will guide the user through the P.V. test workflow using pop-up messages instructing the user when to zero the reader, when to insert the testing standard, and which testing standard to use.
- The P.V. test will then run automatically, taking about 2 minutes to analyze the results and display a “pass” or “fail” for each of the photometric and wavelength accuracy parameters.
- The P.V. test results can be saved or printed as a secure PDF. All P.V. tests are recorded in the audit trail.
- If any test parameter fails, DoseControl will not allow dosimeter measurements using the failed reader. The module enforces a process that guides a second user to log in, repeat the P.V. test. If the second test passes, the software prompts the first user to log in and repeat the P.V. test to confirm the passing results. Only if the P.V. test is passed by both the first and second reader will the software allow the reader to be used to make dosimeter measurements.
- The P.V. test is executed by any user with a Technician role, as defined in the software’s user manager.
- The P.V. test parameters and frequency are configured by the Application Admin. The Admin can set P.V. frequency for any timeframe, at which point the technician will be automatically prompted to perform a P.V. test at the designated time. Or, the Admin can set to P.V. to operate on-demand, so that the technician can click the module button and perform a P.V. test at will.

DoseControl uses a single photometric standard from the user’s kit to test photometric accuracy, and the internal xenon lamp of the Evolution to test wavelength accuracy and repeatability. The Evo’s xenon lamp is an excellent standard to use as a reference for wavelength accuracy. The element xenon has strong, fundamental lines throughout the UV-visible range; therefore, the Evo’s xenon lamp provides a fundamental wavelength standard that never requires calibration.

#### NOTE

The wavelength accuracy test criteria were developed by Thermo Scientific and are used for wavelength accuracy and repeatability testing in the Thermo Insight software for the Evolution. These acceptance criteria values cannot be changed and are hard coded into the DoseControl software.

---

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## NOTE

While the xenon emission lines are a manufacturer (Thermo) standard, xenon is not recognized by all organizations as a traceable reference. However, the only requirement for wavelength accuracy is that the instrument is continually verified to be accurate against some type of fixed reference, for which xenon is a perfect solution.

### Description of the P.V. module tests:

**Photometric Accuracy** – The Photometric Accuracy test determines the spectrophotometer's measured signal intensity values compared to the actual signal intensity values. DoseControl uses a single photometric standard. The user must place the

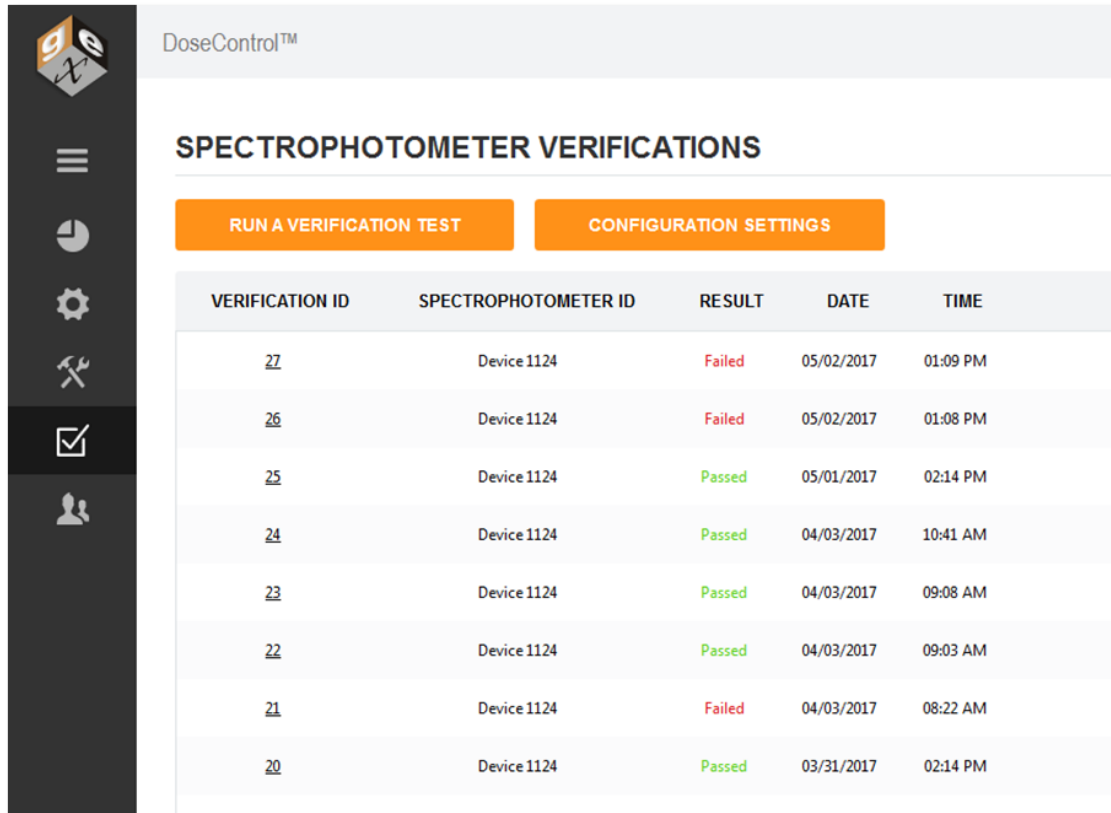
**Wavelength Accuracy & Repeatability** – The Wavelength Accuracy & Repeatability test determines the wavelength value reported by the spectrophotometer compared to the actual value. DoseControl locates the peak wavelength near 541.9 nm of the Evolution's internal xenon lamp and repeats the test three (3) times.

The P.V. home screen shown below features a list of all the tests run for all Evolution spectrophotometers in the system.

- Verification ID – unique test ID auto-assigned by the software to each PV test
- Spectrophotometer ID – the ID from the Reader Configuration in Setup
- Result – **Passed** or **Failed** (incomplete PV tests automatically fail)
- Date – Date of completion of the PV test
- Time – Time of completion of the PV test

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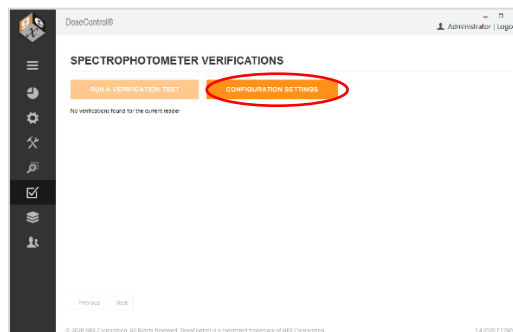


P.V. module home screen

## Configure the Performance Verification P.V. Module

To set up the parameters for a performance verification (P.V.) test within the module:

- 1 Select the P.V. module icon  from the menu bar to open the P.V. home screen.
- 2 Click the “Configuration Settings” button.



- 3 On the Verification Configurations Settings screen, click the “Add New Configuration” button:
- 4 Choose one (1) standard from the Thermo Spectronic Standards Kit (or similar standards kit). Use the calibration certificate from the Standards Kit to determine the certified absorbance value for the standard. Use the wavelength closest to the wavelength that will be used to measure the dosimeter. Use 546.1nm for B3 dosimeters because B3 is measured at 552nm. Example:

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**ThermoFisher SCIENTIFIC**  
 5225 Verona Rd., Bldg. 1  
 Madison, WI 53711 USA

Technical Support: 1 800 532 4752  
 International Support +1 608 273 5017  
 www.thermo.com

**NVLAP**  
 CALIBRATION  
 NVLAP LAB CODE 200955-0

**Certificate of Calibration**  
**SPECTRONIC Standards 2 Kit 840-253100**

**Submitted to:**  
 GEX CORP  
 7330 S ALTON WAY STE 121  
 CENTENNIAL, CO 80112  
 USA  
 CHRISTINE WOLFER

**Serial Number:** SA0799  
**Certificate Number:** CC011436  
**Date of Calibration:** 18 Jun 2020  
**Performed by:** RONALD CHRISTIANSON  
**Test Method:** 357-018500 Rev A  
**Bench Used:** EV300 999002 v  
**Sample Temperature:** 23 ± 1 °C

**COPY**

**Certified Percent Transmittance Values and Uncertainties**

Standard ID	SA0799 -1	SA0799 -2	SA0799 -3	SA0799 -4
<b>Nominal %T</b>	<b>50 %T</b>	<b>30 %T</b>	<b>10 %T</b>	<b>3 %T</b>
<b>Uncertainty</b>	<b>± 0.30 %T</b>	<b>± 0.18 %T</b>	<b>± 0.071 %T</b>	<b>± 0.048 %T</b>
440.0 nm	45.12 %T	27.10 %T	7.40 %T	2.08 %T
465.0 nm	51.46 %T	33.51 %T	9.28 %T	2.92 %T
546.1 nm	52.14 %T	34.40 %T	8.99 %T	2.78 %T
590.0 nm	50.00 %T	31.56 %T	8.02 %T	2.34 %T
635.0 nm	50.27 %T	31.09 %T	9.55 %T	3.05 %T

**Certified Absorbance Values and Uncertainties**

Standard ID	SA0799 -1	SA0799 -2	SA0799 -3	SA0799 -4
<b>Nominal Abs</b>	<b>0.3 A</b>	<b>0.5 A</b>	<b>1.0 A</b>	<b>1.5 A</b>
<b>Uncertainty</b>	<b>± 0.0026 A</b>	<b>± 0.0026 A</b>	<b>± 0.0031 A</b>	<b>± 0.0070 A</b>
440.0 nm	0.3456 A	0.5671 A	1.1306 A	1.6822 A
465.0 nm	0.2885 A	0.4748 A	1.0325 A	1.5352 A
546.1 nm	0.2828 A	0.4774 A	1.0460 A	1.5557 A
590.0 nm	0.3002 A	0.5009 A	1.0958 A	1.6305 A
635.0 nm	0.2987 A	0.5074 A	1.0199 A	1.5162 A

Example calibration certificate

- Complete all the required fields on the Add New Reference screen. Click "Add Reference" button when complete. See example in screenshot below.
  - Reference Identifier** – Enter an ID for the photometric reference. Reference filters typically have an assigned ID number labeled on the filter that is used to link the physical filter to the Certificate with the values pertaining to that filter.
    - IMPORTANT:** The Reference Identifier will be the name that is displayed to the user when performing a P.V. test in the software. Make sure you use a reference ID that clearly identifies the correct standard. Example: SA0799-2 30%T provides the exact ID printed on the standard's label.
  - Reference Description** – Enter a text description of the ID as additional detail to the ID.
  - Frequency (hrs)** – Enter the frequency for PV testing (e.g. 24 hours). Leave this field 'n/a' or enter '0' if you want to configure PV for 'as needed' to let operators choose when to perform PV.
  - Absorbance Spec Min** – The minimum acceptance limit of the Photometric Reference in absorbance units to the thousandths (to 3 decimal places, .000).

**IMPORTANT:** Thermo's published absorbance accuracy for the **Evolution One Plus** is **±0.004A** and for the **Evolution 220** is **±0.006A**. It is the customer's responsibility to always reference the Thermo product specification documentation for the Evolution spectrophotometer.

- Absorbance Spec Min is calculated by:

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**Absorbance Spec Min** = Certified value of Reference – (Reference Uncertainty + Evolution Specification for ABS accuracy)

- Example calculation (using calibration certificate above):

$$0.4548 = 0.4634 - (0.0026 + 0.004)$$

**ABS Spec Min is 0.455** (rounded to 3 decimal places).

- **Absorbance Spec Max** – The maximum acceptance limit of the photometric reference in absorbance units to the thousandths (to 3 decimal places, .000).

**Absorbance Spec Max** = Certified Value of Reference + (Reference Uncertainty + Evolution Specification for ABS accuracy)

- Example calculation (using calibration certificate above):

$$0.472 = 0.4634 + (0.0026 + 0.004)$$

**ABS Spec Max is 0.472** (rounded to 3 decimal places).

- **Photometric Testing Wavelength (nm)** – The wavelength at which the photometric standard is certified, in tenths of nanometers (e.g. 546.1 nm).
- **Certified wavelength Min Spec (nm)** – Wavelength accuracy min specification is hardcoded at 541.1 nm.
- **Certified wavelength Max Spec (nm)** – Wavelength accuracy min specification is hardcoded at 542.7 nm.
- **Wavelength Repeatability Spec (stdev)** – the allowable standard deviation for the 3 wavelength accuracy tests.

**IMPORTANT:** Thermo's published wavelength accuracy for the **Evolution One Plus is 0.05nm** and for the **Evolution 220 is 0.50 nm**, so enter the appropriate specification into the Wavelength Repeatability Spec field. It is the customer's responsibility to always reference the Thermo product specification documentation for the Evolution spectrophotometer.

---

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### ADD NEW REFERENCE

Reference Identifier:	<input type="text" value="SA0799-2 30%T standard"/>
Reference Description:	<input type="text" value="SA0799-2 0.5A 30%T standard"/>
Frequency (hrs):	<input type="text" value="n/a"/>
Absorbance Spec Min:	<input type="text" value="0.455"/>
Absorbance Spec Max:	<input type="text" value="0.472"/>
Photometric Testing Wavelength (nm):	<input type="text" value="546.1"/>
Certified wavelength Min Spec (nm):	<input type="text" value="541.1"/>
Certified wavelength Max Spec (nm):	<input type="text" value="542.7"/>
Wavelength Repeatability Spec (stdev):	<input type="text" value="0.50"/>

ADD REFERENCE

*Example of new reference setup*

- 6 Click "Is Active" switch to activate the Reference. When a user conducts a P.V. test, the active reference will be used. Only one reference can be active at a time.

#### VERIFICATION CONFIGURATION SETTINGS

REFERENCE IDENTIFIER	REFERENCE DESCRIPTION	IS ACTIVE	DELETE
SA0799	30%T from SA0799	<input checked="" type="radio"/>	

ADD NEW CONFIGURATION
SAVE

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- 7 Click "Save" button to save the configuration settings.

## Performing a Performance Verification (P.V.) of the Evolution Reader

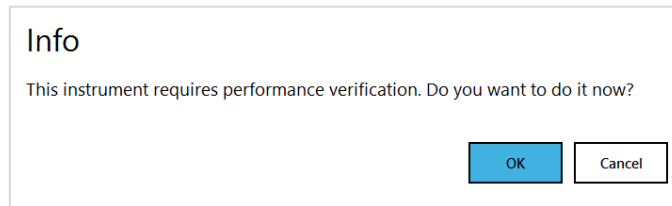
### IMPORTANT

The sample compartment of the Evolution reader must be closed during the P.V. testing. Place the front panel into position on the reader and slide the lid closed.

### IMPORTANT


Once the user has started PV, canceling the process is not an option. If interrupted by power outage or other reason, the PV test will be incomplete, and all incomplete tests automatically are assigned a "FAILED" status. The instrument remains unavailable for use until the passing criteria is achieved.

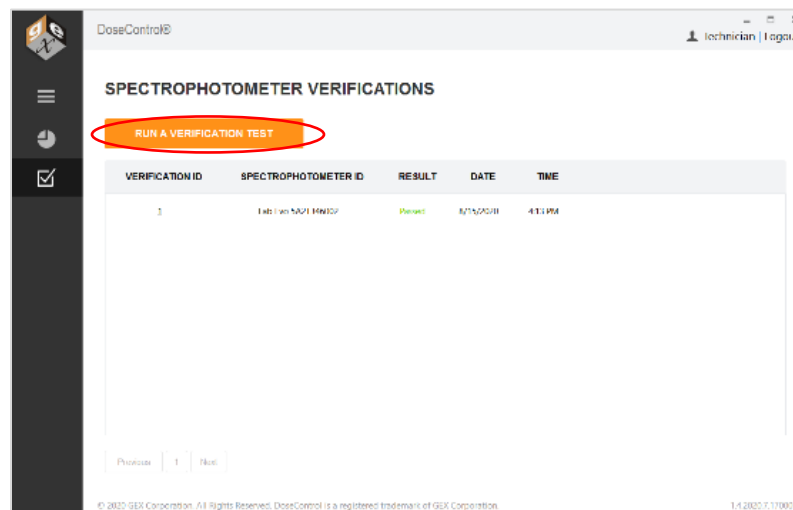
There are two ways to perform a P.V. test in DoseControl. Users can perform a P.V. test on-demand at any time directly from the P.V. main screen. If the Admin configured the module so that a P.V. test must occur at a specific frequency (e.g. every 24 hours) the software will automatically prompt the user to perform a P.V. test at that time. The user will not be able to proceed to measuring dosimeters until the P.V. is complete and the reader passes the test. The software will show a message asking if the user to perform the P.V. test:



*Example of prompt for user to perform a P.V.*

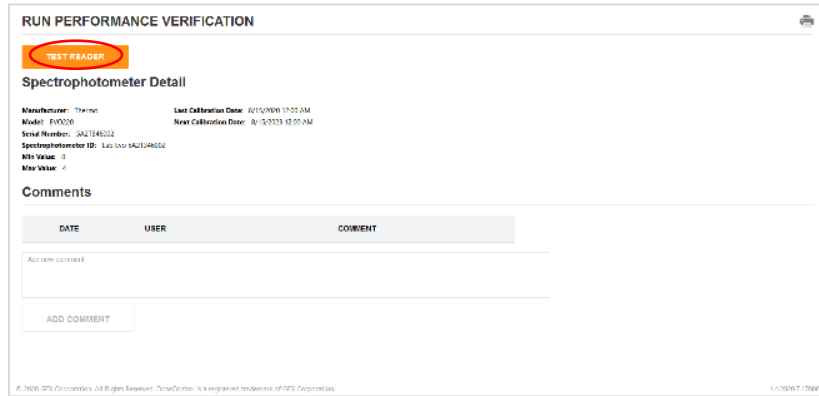
Follow the instructions below to perform a P.V. test. Carefully follow the on-screen prompts:

- 1 Ensure the correct holder is inserted in the Evolution. The Windose dosimeter holder is also used to hold reference standards.
- 2 Click the P.V. icon  to open the P.V. main screen.
- 3 Click the "Run a Verification Test" button.

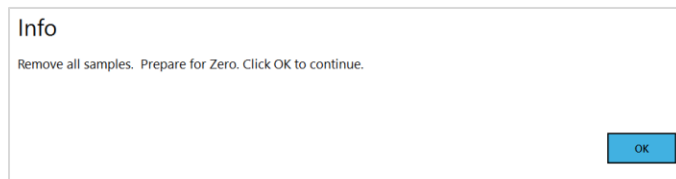


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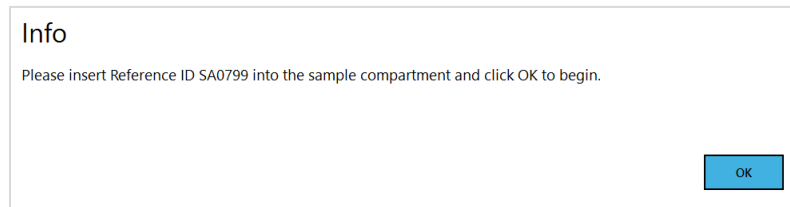
- 4 Next, click the “Test Reader” button:



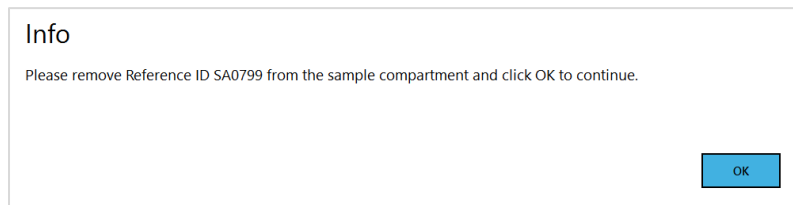
- 5 Next, the software will show a message telling the user to remove all samples from the dosimeter holder in the Evolution reader. Remove any samples from the dosimeter holder and close the lid of the Evo to prepare it for zeroing. Click “Ok” after confirming there is no standard or dosimeter in the holder.



- 6 The Evolution reader will proceed to zero. The reader will make an audible sound as its zeroing.
- 7 Next, the software will show a message instructing the user to insert the reference. Insert the reference with the correct reference ID into the dosimeter holder. Click “Ok” after inserting the reference and closing the lid of the Evo.



- 8 Next, the software will show a message instructing the user to remove the reference from the holder. Remove the reference and close the lid of the Evo. Click “Ok” to continue.



- 9 The P.V. test will take approximately 2 minutes to complete. The Evo reader will make audible sounds as it proceeds through the test. When the test is complete, the software will display the results:

**VIEW PERFORMANCE VERIFICATION**

Verification Test Id: 1      Date: Aug 15, 2020 16:13  
 Standard Reference ID: SA0799      User: Administrator

DESCRIPTION	PARAMETERS	RESULT
Photometric Accuracy	0.455 to 0.472 A	0.463 <span style="color: green;">Pass</span>
Wavelength 1	541.1 to 542.7 nm	541.6 <span style="color: green;">Pass</span>
Wavelength 2	541.1 to 542.7 nm	541.5 <span style="color: green;">Pass</span>
Wavelength 3	541.1 to 542.7 nm	541.5 <span style="color: green;">Pass</span>
Wavelength Std Dev	<= 0.5	0.047 <span style="color: green;">Pass</span>

**Spectrophotometer Detail**

Manufacturer: Thermo      Last Calibration Date: 8/15/2020 12:00 AM  
 Model: EVO220      Next Calibration Date: 8/15/2023 12:00 AM  
 Serial Number: 5A2T346002      Start Date: 8/15/2020 4:07 PM  
 Spectrophotometer ID: Lab Evo 5A2T346002      End Date: 8/15/2020 4:13 PM  
 Min Value: 0  
 Max Value: 4

**Comments**

DATE	USER	COMMENT
Add new comment		

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- 10 To create a secure PDF document of the P.V. test results click the printer icon in the upper right corner of the screen (see screenshot above). The software will create a PDF document that can be saved or printed.

## Spectrophotometer Daily Performance Verification Test

### Equipment ID: 5A2T346002

Spectrophotometer Daily Verification ID: 1

**Date Performed:** 15 Aug 2020 16:13      **Performed By:** admin  
**Standard Reference ID:** SA0799

Test Description	Test Parameters	Result	Pass/Fail
Photometric Accuracy	0.455 to 0.472 A	0.463	Pass
Wavelength 1	541.1 to 542.7 nm	541.6	Pass
Wavelength 2	541.1 to 542.7 nm	541.5	Pass
Wavelength 3	541.1 to 542.7 nm	541.5	Pass
Wavelength Std Dev	<= 0.5	0.047	Pass

**Spectrophotometer Detail**

Manufacturer: Thermo	Model: EVO220	Serial Number: 5A2T346002
		ID: Lab Evo 5A2T346002
Last Calibration Date: 8/15/2020 12:00 AM	Next Calibration Date: 8/15/2023 12:00 AM	
Start Date: 8/15/2020 4:07 PM	End Date: 8/15/2020 4:13 PM	
Min Value: 0	Max Value: 4	

Prepared by Signature	Date
Approval Signature	Date

Example PDF document of P.V. test results.

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## Performance Verification (P.V.) Pass/Fail

If the P.V. test passes, the user can proceed immediately to any area of the software after completion.

### VIEW PERFORMANCE VERIFICATION

Verification Test Id: 1      Date: Aug 15, 2020 16:13  
Standard Reference ID: SA0799      User: Administrator

DESCRIPTION	PARAMETERS	RESULT
Photometric Accuracy	0.455 to 0.472 A	0.463 <span>Passed</span>
Wavelength 1	541.1 to 542.7 nm	541.6 <span>Passed</span>
Wavelength 2	541.1 to 542.7 nm	541.5 <span>Passed</span>
Wavelength 3	541.1 to 542.7 nm	541.5 <span>Passed</span>
Wavelength Std Dev	<= 0.5	0.047 <span>Passed</span>

#### Spectrophotometer Detail

Manufacturer: Thermo      Last Calibration Date: 8/15/2020 12:00 AM  
Model: EV2220      Next Calibration Date: 8/15/2023 12:00 AM  
Serial Number: SA2T346002      Start Date: 8/15/2020 4:07 PM  
Spectrophotometer ID: Lab-Evo-SA2T346002      End Date: 8/15/2020 4:13 PM  
Min Value: 0  
Max Value: 4

#### Comments

DATE	USER	COMMENT
Add new comment		

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If the P.V. test fails, the Evolution reader is not allowed to be used to make measurements until two (2) successive P.V. tests are passed to confirm the reader is operating within specifications. After a failed P.V. test, the software requires a different user to login and perform a P.V. test with passing results. Next, software requires the original user to login and perform a second P.V. test with passing results. If both users get passing P.V. test results, the software then allows access to all areas of DoseControl and allows the Evolution reader to be used to measure dosimeters.

### VIEW PERFORMANCE VERIFICATION

Verification Test Id: 32      Date: May 8, 2017 14:19  
Standard Reference ID: SA0520-2      User: Administrator

DESCRIPTION	PARAMETERS	RESULT
Photometric Accuracy	0.305 to 0.311 A	0 <span>Failed</span>
Wavelength 1	541.1 to 542.7 nm	541.9 <span>Passed</span>
Wavelength 2	541.1 to 542.7 nm	542 <span>Passed</span>
Wavelength 3	541.1 to 542.7 nm	541.9 <span>Passed</span>
Wavelength Std Dev	<= 0.5	0.047 <span>Passed</span>

### Instructions for P.V. test failure

- 1 Return to the P.V. main screen by clicking the checkmark icon 
- 2 The software will notify the user with a message stating, "This instrument requires performance verification. Do you want to do it now?" Click "Ok".
- 3 The software will require a different user to login. Any user with a Technician or Admin role can login.

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## RUN PERFORMANCE VERIFICATION

This instrument requires performance verification to be run by a different user. Please log in

Username:

Password:

Login

- 4 Proceed with the P.V. test.
- 5 If this P.V. test is a pass, the software will ask for the original user to login again and perform the P.V. test a second time.
- 6 If the original user completes a passing P.V. test the reader is then available to all Technicians for measurement.

### IMPORTANT

The original user specified must login and complete a successful PV for the software to unlock use of the spectrophotometer for dosimeter measurements. The software will not open or allow measurements until both P.V. tests are complete and successful.

- 7 If the subsequent P.V. tests continue to fail, the Evolution reader is likely in need of service. Contact GEX Customer Support or Thermo Customer Support.

### NOTE

A demonstration video is available on our website - <http://www.gexcorp.com/videolibrary.html>

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## 13 APPENDIX 1: Installation & Setup of Microsoft SQL Server Express (for Basic License)

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### SQL Server Overview

DoseControl software requires a SQL database. SQL is a database that resides on a centralized server and is accessed by multiple PCs. SQL is licensed to companies in many ways and you will be responsible for determining and managing your licensing. GEX does not sell or license SQL. For in-depth information about the various SQL Server types and options, please visit the [official Microsoft site "Editions and supported features of SQL Server 2019"](#).

Many Basic License users of DoseControl use Microsoft SQL Express, a free edition of SQL Server, for the database.

### Introduction to Microsoft SQL Express (A Lightweight Version of MS SQL Server)

Microsoft SQL Express is available from Microsoft with any licensed Windows installation. A SQL Express database cannot be larger than 10 GB size; this size is sufficient for many users. You can migrate to SQL standard from SQL Express at any time by paying the license fee.

The method for installing SQL Express involves downloading the installation package from Microsoft and installing it on your PC. If you have purchased the Basic License for DoseControl then you will use the SQL Express database installed on a single PC. A SQL Express database cannot be shared between PC's.

### Installing SQL Server Express 2019

#### IMPORTANT

You must perform all the following installation and configuration steps using an account that has **administrative privileges** for the computer that will host SQL Server. For Basic License users, this is typically the same computer on which DoseControl is being installed.

#### Download and Install Microsoft SQL Server Express 2019

- 1 **Log in as an administrator**
- 2 **Download SQL Server Express installer**

Go to the [Microsoft SQL Server 2019 Express download page](#), select the English language version, and then click the "Download" button to download the installer. **Note:** DoseControl may run on SQL in other languages but has not been formally tested (customers have sometimes been successful) and GEX is unable to support users running other languages.

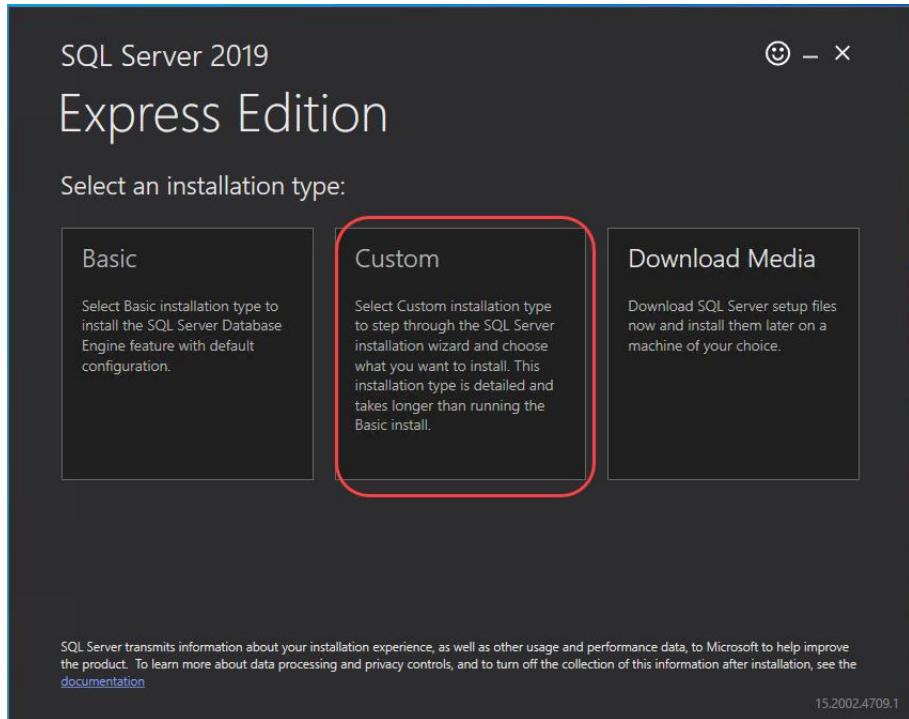
Next, you will execute the installer and follow the on-screen prompts to install SQL Server.

- 3 **Select Installation Type**

When you execute the downloaded file, you will be prompted for an administrator account. The installer will open a window. The window offers three possible ways to install SQL Server Express Edition which are Basic, Custom and Download Media. Select "Custom".

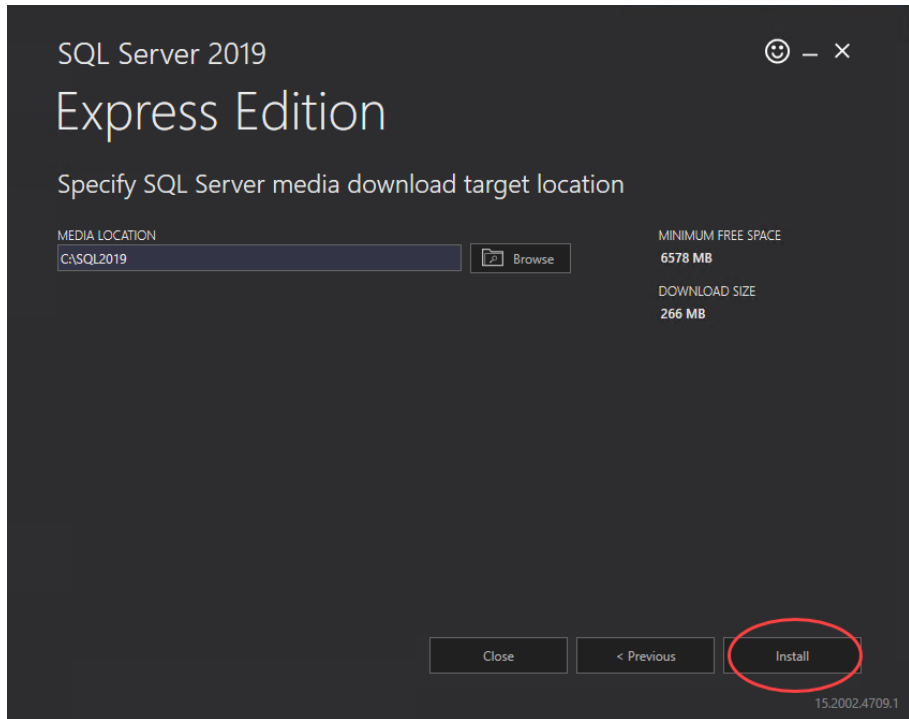
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**4 Select a location for installing.**

Keep the default Media Location and click the “Install” button. The installation process will begin, and you will see a progress window.



**5 The SQL Server Installation Center opens**

In the installation center window, click the “New SQL stand-alone installation...” link. The SQL Server 2019 Setup window opens.

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## 6 License Terms

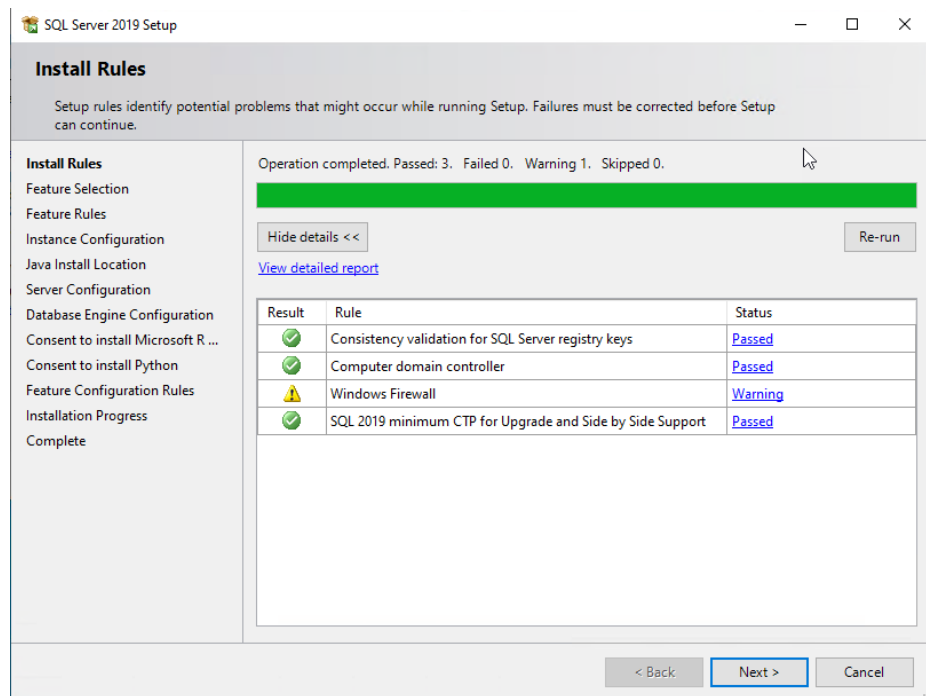
Accept the license terms and click “Next”. The Global Rules page will open and display a progress bar, and then the Microsoft Update page will open.

## 7 Microsoft Update

Select the option to “Use Microsoft Update to check for updates (recommended)” and click “Next”. The Install Setup Files window will open and display a progress bar, and then the Install Rules page will open

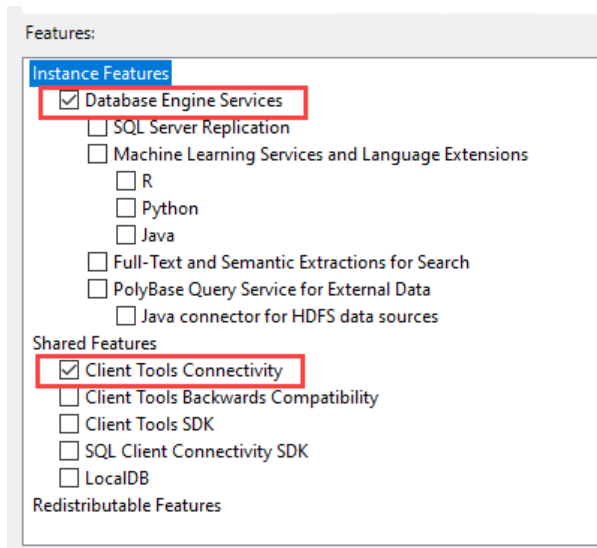
## 8 Install Rules

On the Install Rules page, each Rule should have a Status of “Passed”, but you may see a warning for Windows Firewall. Disregard this warning and click “Next”.



## 9 Feature Selection

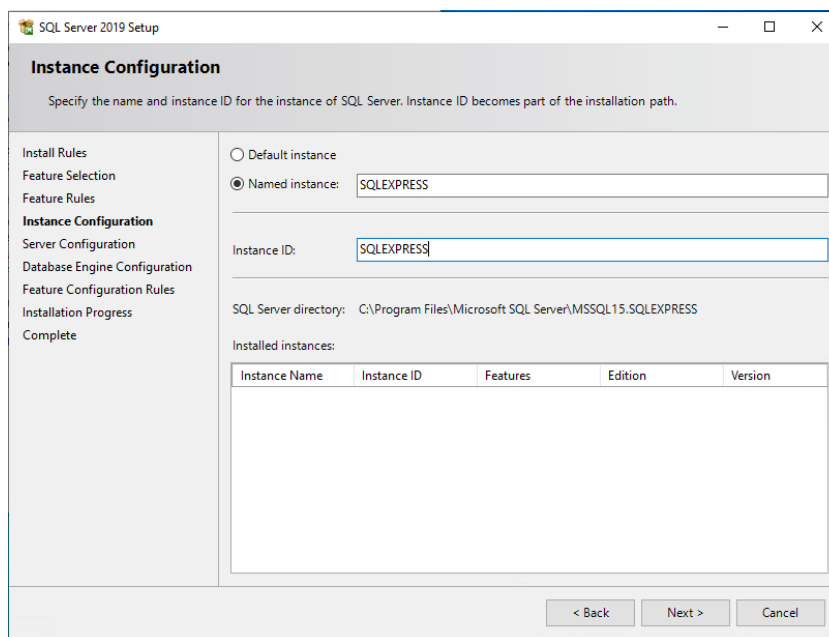
On the Feature Selection page, click the “Unselect All” button. In the Features list, only select the following Instance Features: Database Engine Services and Client Tools Connectivity:



Keep all other default values and click "Next". The Feature Rules page will open very briefly, and then the Instance Configuration page will open.

## 10 Instance Configuration

If not already selected, choose "Named Instance" and enter "SQLEXPRESS" for both the Named Instance and the Instance ID:



Click "Next".

## 11 Server Configuration

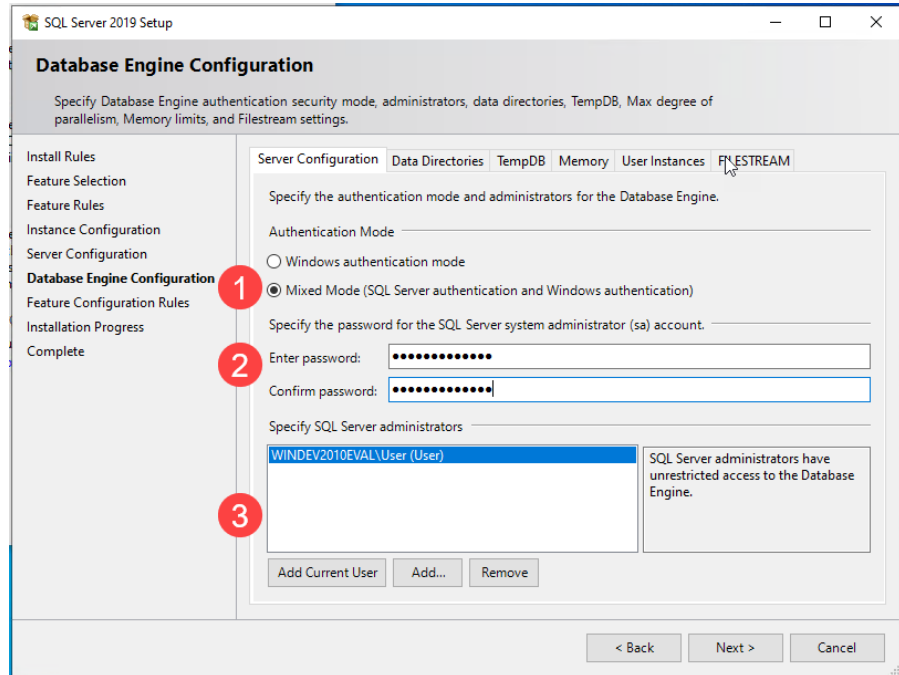
Change no values and click "Next".

## 12 Database Engine Configuration

On the Server Configuration tab, **1)** select "Mixed Mode", **2)** specify the password for the SQL Server system administrator (sa) account, and **3)** if the current user installing SQL is not displayed in the "Specify SQL Server

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administrators” list, click the “Add Current User” button. **IMPORTANT:** Ensure that you make a copy of the sa password and keep it in a secure location.



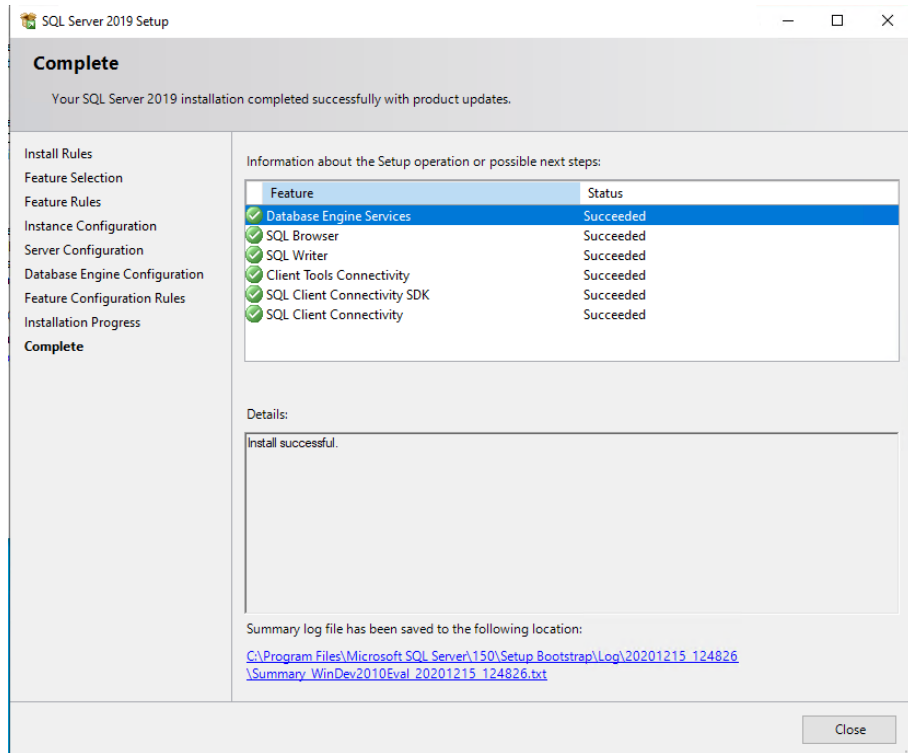
Do not change any of the values on any other tab in the Database Engine Configuration page. Click “Next”. The Feature Configuration Rules page will open very briefly, and then the Installation Process page will open.

### 13 Installation Process

SQL Server Express is now being installed and progress bar will appear. When the process completes the Complete page will open.

### 14 Complete

The Status for each Feature in the list should be “Succeeded”. Click the “Close” button.



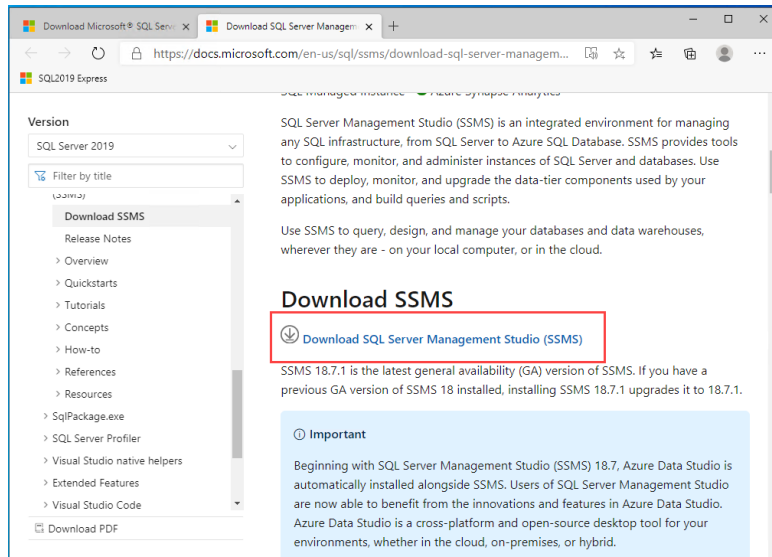
## Install SQL Server Management Studio (SSMS)

You may be curious as to why you need to install something else other than SQL Server itself. SQL Server, like other modern relational databases, uses a client-server architecture. The database itself is the server and contains all the data and the capability to add, modify, delete, and access the data. A client is needed to connect to the database and perform specific commands. The most popular client by far for SQL Server is Microsoft's SQL Server Management Studio (SSMS), which you will install in this section.

### 15 Download SSMS

**IMPORTANT:** You should still be logged in to the computer as an administrator for the following steps. The SQL Server Installation Center window should still be open (if it is not, then you can launch it from the start menu). Click the Install SQL Server Management Tools link. A download page will open in your web browser; click the Download SQL Server Management Studio (SSMS) link:

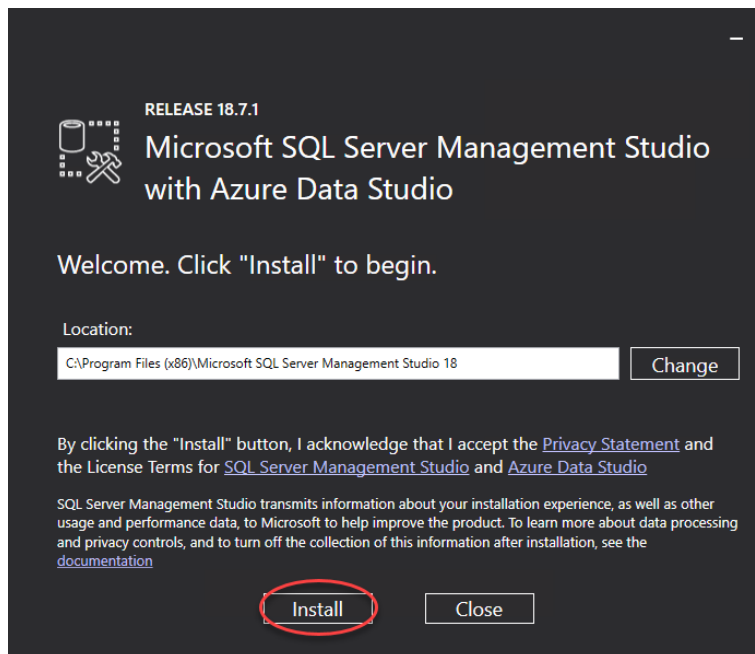
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## 16 Open the installer

Once downloaded, open the installer file (you will need to provide admin permission).

- 17 **Click the “Install” button to begin.** A progress screen will appear. Let it progress through until completion, then you will see a screen indicating successful setup – click close. SQL Server Management Studio (SSMS) is now installed. You can pin SSMS to your taskbar or Start menu.



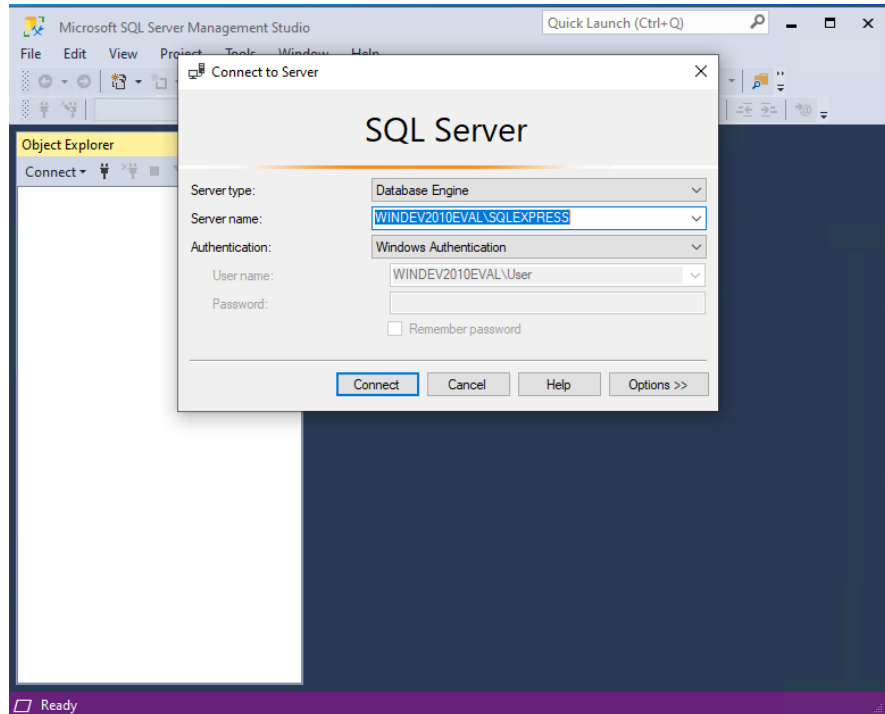
## Configure SQL Server Express for Use with DoseControl

Still logged in as an administrator, follow the remaining steps to configure SQL Server Express so that DoseControl will work on your system.

## 18 Connect to your Database Server

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If not already, open SQL Server Management Studio (SSMS) (you can locate SSMS in the Window Start menu). In the Connect to Server window, the Server name field should automatically display your SQLEXPRESS server. Authentication should be set to Windows Authentication. Click “Connect”.



## 19 Configure SQL Authentication logins

**Step 1:** Expand the “Security” folder for the SQL server on which your DoseControl database will reside. Right-click on “Logins” and select “New Login...”.

**Step 2:** In the “General” section, enter the Login name **gexapp** (all lower case, no spaces). Select “SQL Server Authentication”. Enter a Password and Confirm password. Unless your IT department or database administrator require you to enable a password enforcement policy, uncheck “Enforce password policy”.

**IMPORTANT:** Ensure that you make a copy of the password and keep it in a secure location.

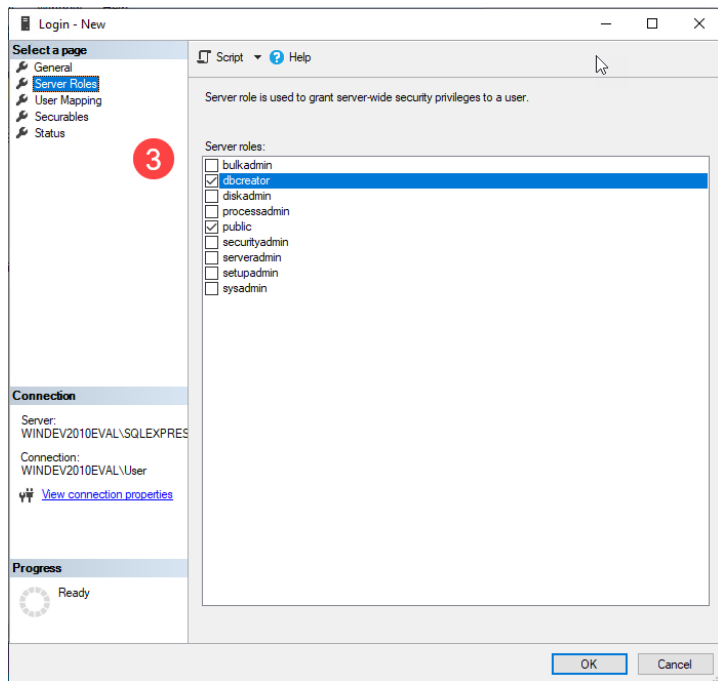
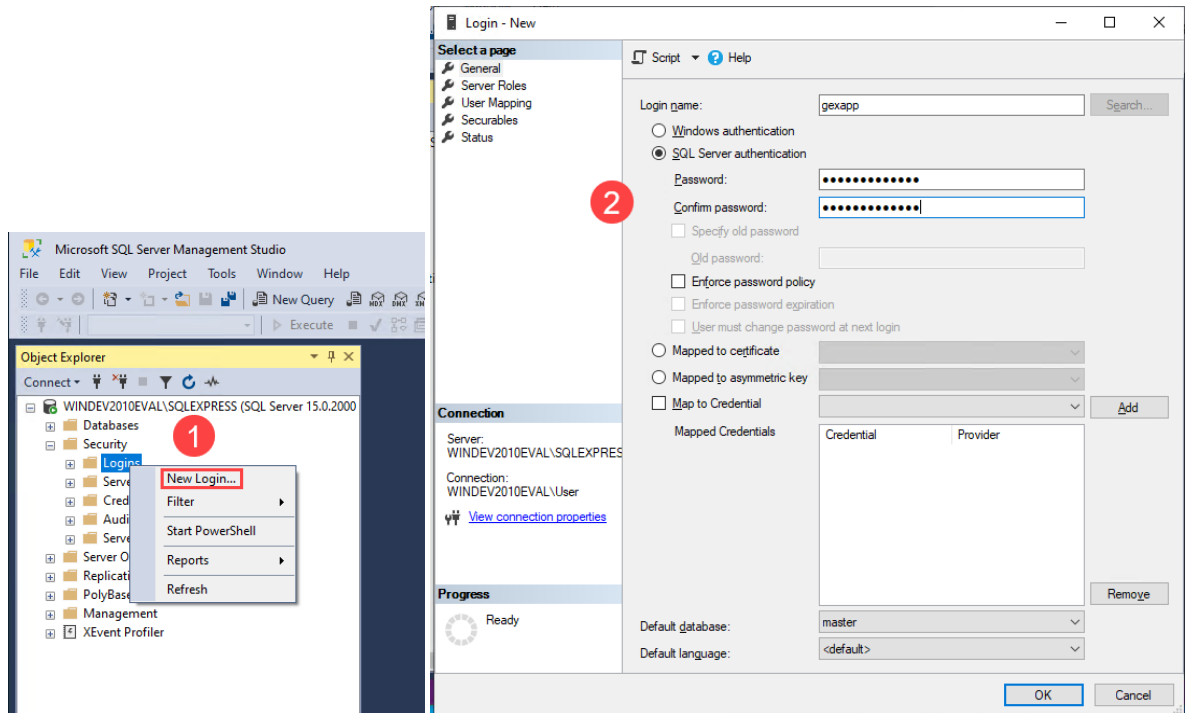
**Step 3:** Next, select the “Server Roles” section and ensure “dbcreator” and “public” are selected. Click OK.

**Step 4:** As a security precaution, expand the Logins folder, right click the “sa” login, and select Properties. Open the Status section, and under Login, select Disabled and then click “OK”.

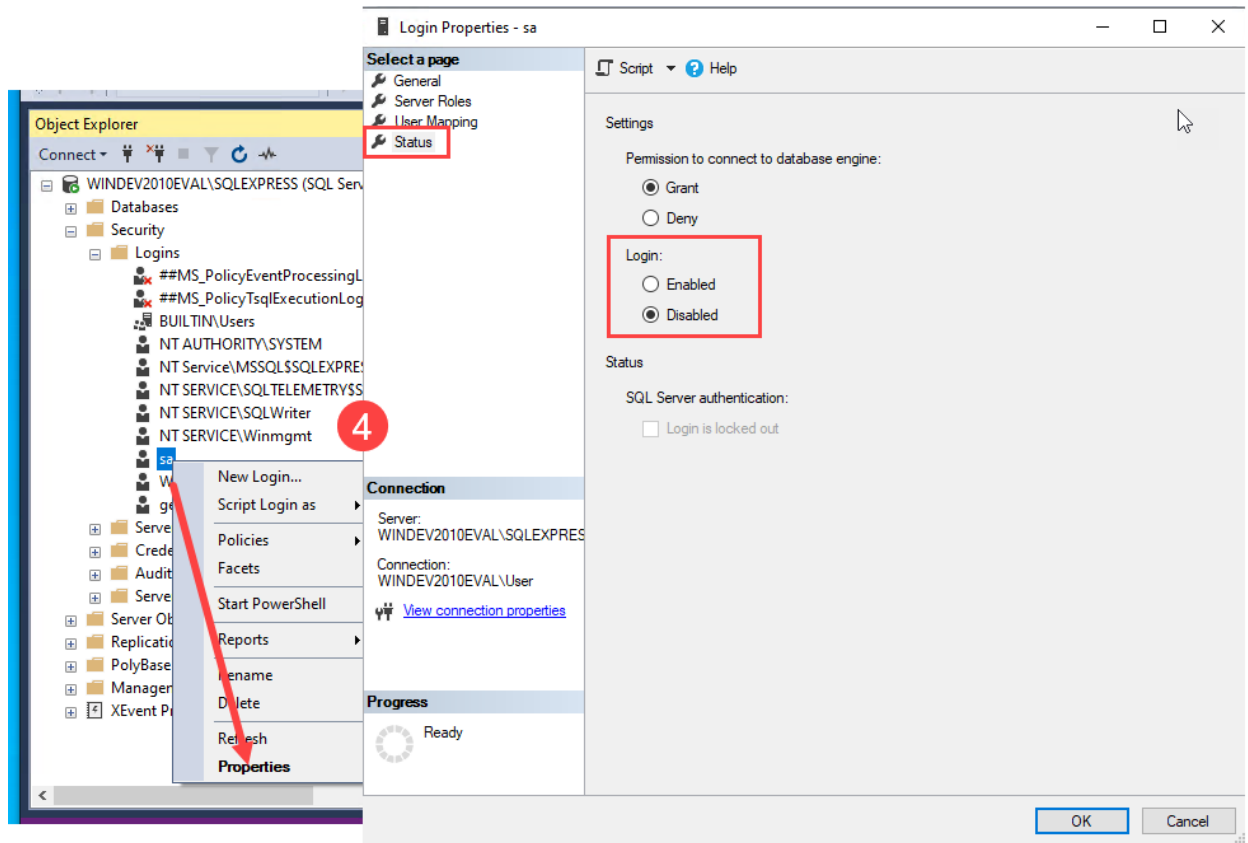
**See the following screenshots for clarification:**

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## Create a Connection String for DoseControl

**NOTE:** The following steps are written explicitly for Basic License users creating a connection string in SQL Server Express. Premier or Enterprise License users, please consult your IT or technical support team.

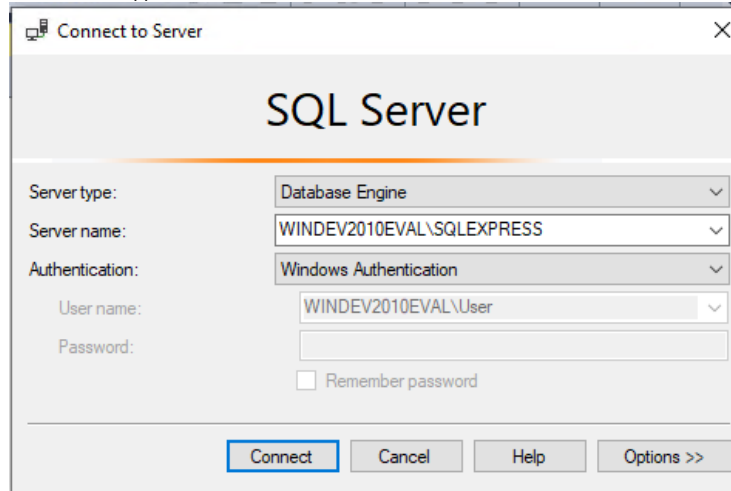
The connection string that DoseControl will use to connect to the database will take the following form, and you will replace the highlighted portions with your system's values:

Data Source=<servername\datasource>; Initial Catalog=GEXApp; User ID=gexapp; Password=<your gexapp login password>; MultipleActiveResultSets=true;

- 20 If SSMS is still open, close it and reopen it. If not, you can launch SSMS from the start menu.
- 21 To get the **Data Source** value for your connection string, make note of the **Server name (Data Source)** that appears in the Connect to Server window. Based on the preceding steps it should appear as <YOURCOMPUTERNAME>SQLEXPRESS (including the backslash). For example, the GEX test

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environment appears as **WINDEV2010EVAL\SQLSERVER**:



- 22 The Initial Catalog value is the name of the database where the DoseControl data will reside. It will be named **GEXApp**.
- 23 The connection string's **User ID** value is the Login **gexapp** that you created in the preceding step **Configure SQL Authentication logins**.
- 24 The connection string's **Password** value was also set in the **Configure SQL Authentication logins** step. You **must** use the password that you saved in that step.
- 25 The DoseControl connection string uses Multiple Active Results Sets. (For information about SQL Server data operations, please see the Microsoft documentation [here](#).)
- 26 You may copy this and use the following connection string when installing DoseControl, **but you must change the Data Source and Password values to your specific values**:  

```
Data Source= WINDEV2010EVAL\SQLSERVER; Initial Catalog=GEXApp; User Id=gexapp;  
Password=password1234; MultipleActiveResultSets=true;
```
- 27 Keep a copy of this connection string available. You will enter the connection string in DoseControl after installing the software as part of the setup process. (See Step 11 below under [First Time Installation of Software - Installation Instructions](#)).

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## 14 APPENDIX 2: Backup & Restore Database Instructions for Microsoft SQL Server Express (Basic License)

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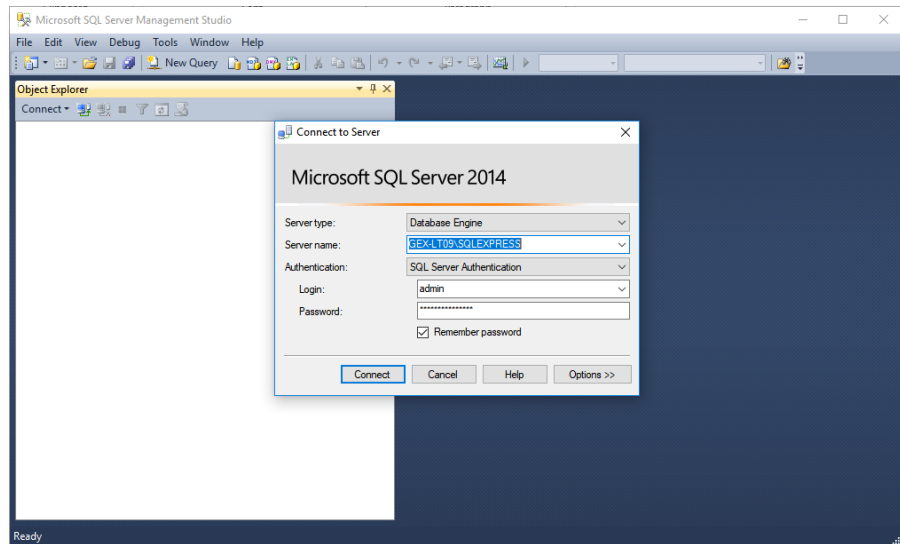
It is important to back-up the database from time to time. Scheduled backups are recommended. For large-scale users, this means setting up automated backups on servers, which will not be discussed here. Herein is a manual method for backing up a SQL Server Express database using Microsoft's SQL Server Management Studio (SSMS).

### IMPORTANT

You must perform the following steps using an account that has administrative privileges for the computer that is hosting SQL Server.

### Step-by-Step Instructions for Creating a SQL database Backup:

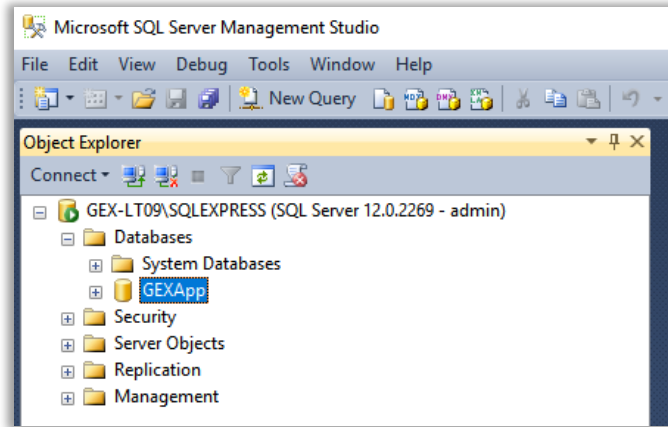
- 1 First, login to SSMS using either a) your SQL Windows Authentication administrator login or b) another user/password that has the appropriate permissions (for example, a SQL Server Authentication login with admin privileges).



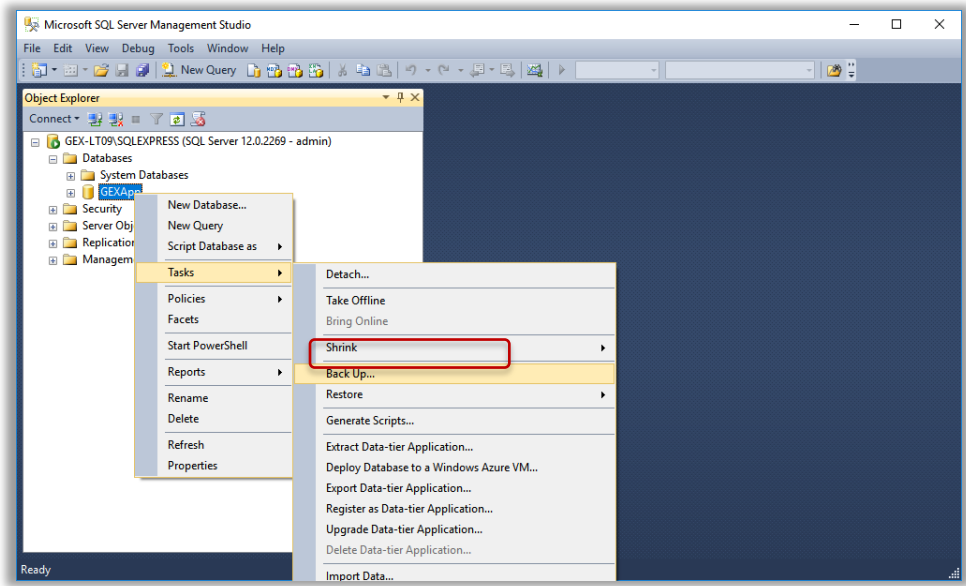
- 2 Expand the "Databases" folder to locate the database instance that you wish to backup. In this example it is called "GEXApp".

---

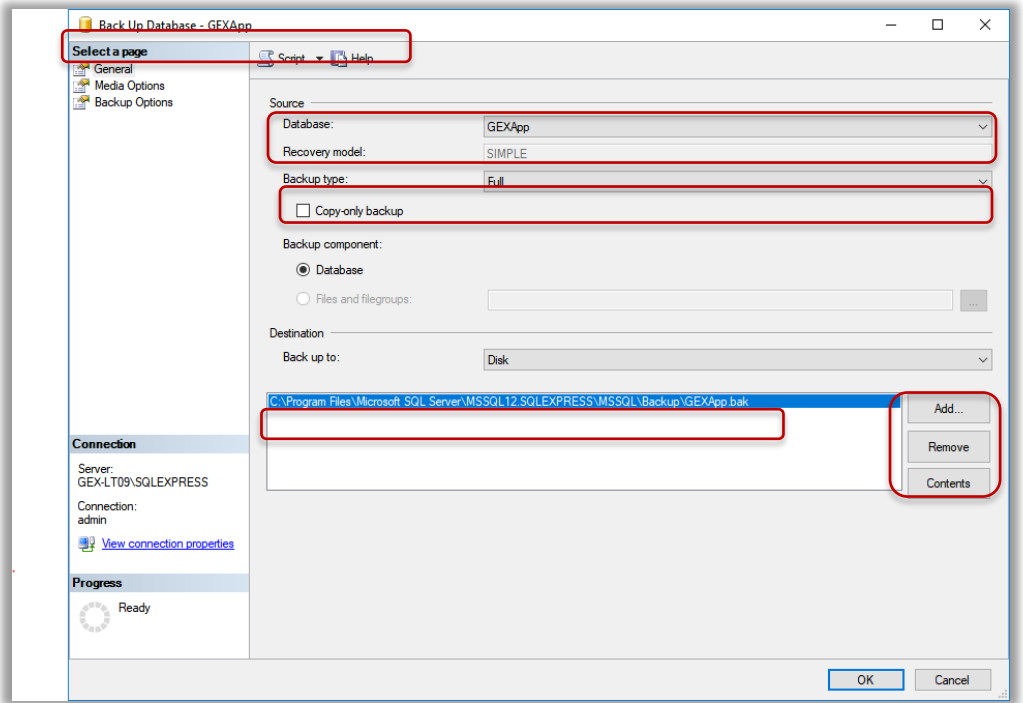
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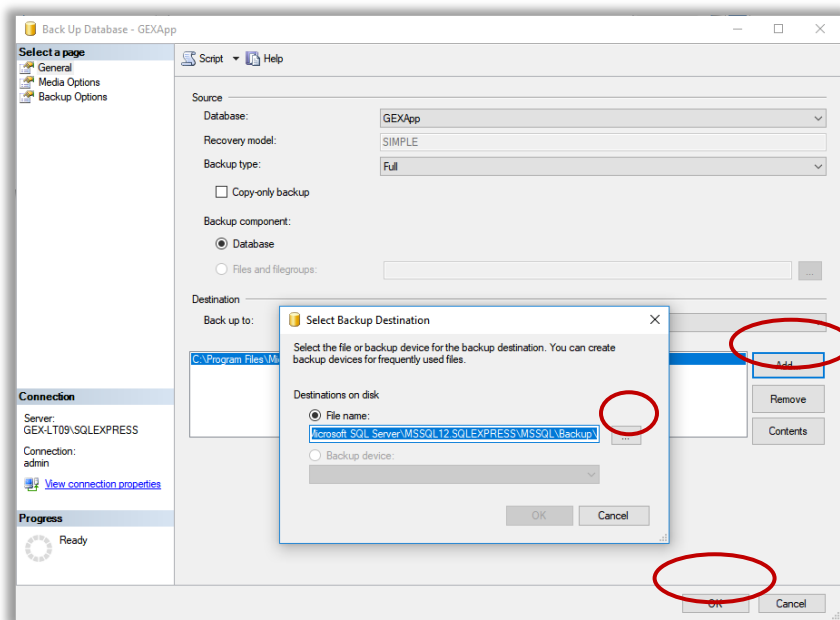
- 3 Right-click on the instance name and select "Tasks -> Back Up".



- 4 The Back Up Database menu will open. The settings should default as shown but check your setting against this example.

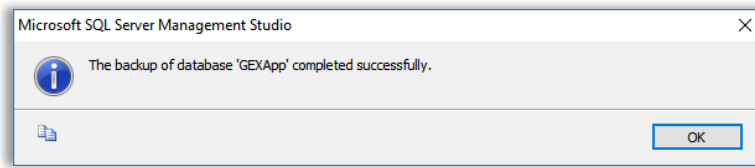


- 5 The file pathway for the backup is listed. The default is into the Program Files folder on the C: drive and it is suggested you do not change it because the Restore function you use if you need to restore from backup will default to this location. If you must, use the 'Add' and 'Remove' buttons to change the pathway to any location on the C: drive except the desktop. Do not backup to the desktop.
- 6 Press the 'Add' button and a dialog box will allow you to navigate to a location of your choosing. Name the backup file with the \*.bak file extension. Press 'OK' on the bottom of the screen to start the backup.



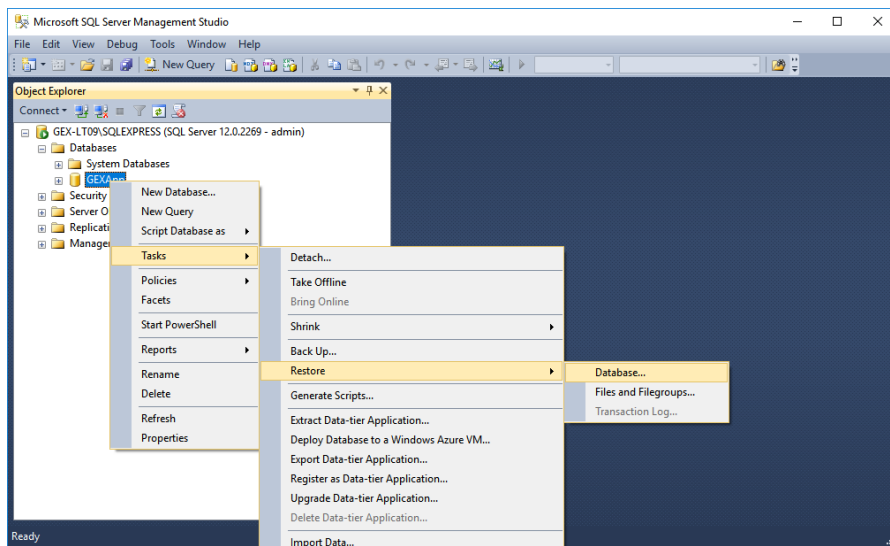
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- 7 SSMS provides a confirmation pop up window about successful completion of the backup, otherwise it will note errors or issues. The backup is complete. The resulting file is located in the specified location and has a \*.bak file extension.

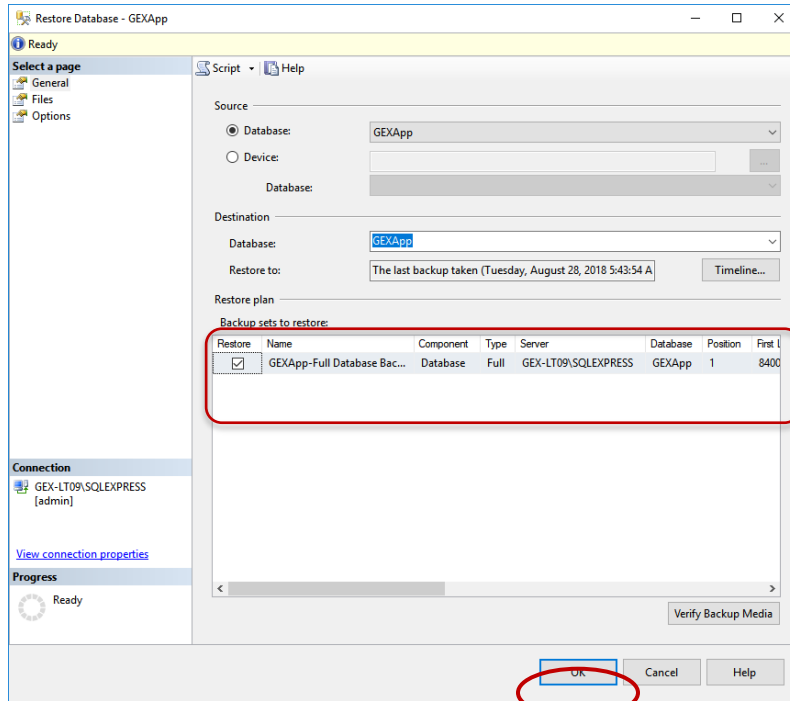


### Step-by-Step Instructions for Restoring a SQL database from a Backup:

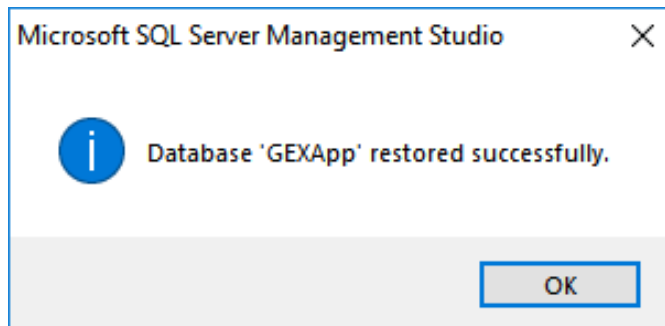
- 1 To restore a database from a \*.bak file, login and navigate to the database instance in SSMS.
- 2 Right-click on the instance name and select "Tasks -> Restore -> Database...".



- 3 The Restore Database menu opens. There will be a list and you can select an older backup if desired. Then press the 'OK' button at the bottom of the screen.



- 4 The restore process is now complete. SSMS will report success or errors upon restore.





## 15 APPENDIX 3: PDF Report Data Fields

This section describes the default PDF report types and data fields. Most data fields are automatically output from DoseControl; the **bolded** data fields need to be configured under Report Headers by the Admin. If you require different data fields, layout, logos, etc. contact GEX. GEX can create a custom PDF template for you using any dosimeter measurement data and user input fields that you wish and designed in a layout that meets your needs.

### **Exporter Type: GEX Default PDF**

**Description:** 2 dosimeters/pouch, routine process monitoring dosimetry. All fields in the table below are included in this report.

**Report header setup:** None.

FIELD NAME:	DESCRIPTION:	FIELD NAME:	DESCRIPTION:
<b>Report Version:</b>	Version number of the report	<b>Tote No:</b>	Tote number (tote or carrier)
<b>DSM Batch ID:</b>	Dosimeter batch ID (from Calibration configuration)	<b>Abs 1:</b>	Absorbance measurement of dosimeter 1
<b>DSM Thickness:</b>	Dosimeter thickness (from Calibration configuration)	<b>Abs 2:</b>	Absorbance measurement of dosimeter 2
<b>Prepared by:</b>	Username that is logged in at the time of report processing	<b>Avg. Abs</b>	Average absorbance of Abs 1 and Abs 2
<b>Date and Time:</b>	Date/time report was processed; will say "not processed" for unprocessed report	<b>Dose (kGy)</b>	Calculated dose in kGy (uses calibration coefficients in Calibration)
<b>Instrument ID:</b>	Spectrophotometer serial number (from Calibration configuration)		

<h1>Dosimetry Report</h1>					
DSM Calibration ID: DA mock reader copy					
<b>Report ID:</b> 2pk default test			<b>Prepared By:</b> Administrator		
<b>Report Version:</b> 1			<b>Date and Time:</b> Not Processed		
<b>DSM Batch ID:</b> DA			<b>Instrument ID:</b> Mock Spectrophotometer		
<b>DSM Thickness:</b> 0.0174					
<b>Position</b>	<b>Tote No.</b>	<b>Abs 1</b>	<b>Abs 2</b>	<b>Avg. Abs</b>	<b>Dose (kGy)</b>
ref 1	33	0.507	0.507	0.507	31.2
ref 1	35	0.507	0.507	0.507	31.2
		0.507	0.507	0.507	31.2

*Example of Default PDF report*

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**Exporter Type: Standard 1 Pack PDF**

**Description:** 1 dosimeters/pouch, routine process monitoring dosimetry. All fields in the table below are included in this report.

**Report header setup:** None.

FIELD NAME:	DESCRIPTION	FIELD NAME:	DESCRIPTION:
Report Version:	Version number of the report	Tote No:	Tote number (tote or carrier)
DSM Batch ID:	Dosimeter batch ID (from Calibration configuration)	Abs 1:	Absorbance measurement of dosimeter 1
DSM Thickness:	Dosimeter thickness (from Calibration configuration)	Dose (kGy)	Calculated dose in kGy (uses calibration coefficients in Calibration)
Prepared by:	Username that is logged in at the time of report processing		
Date and Time:	Date/time report was processed; will say "not processed" for unprocessed report		
Instrument ID:	Spectrophotometer serial number (from Calibration configuration)		

# Dosimetry Report

DSM Calibration ID: P1B3-G30

**Report ID:** c123Std1pk  
**Report Version:** 1  
**DSM Batch ID:** B3 Film - DA  
**DSM Thickness:** 0.0185

**Prepared By:** Michelle Cowan  
**Date and Time:** Not Processed  
**Instrument ID:** Lab G30

Position	Tote No.	Abs 1	Dose (kGy)
10	44	0.473	26.0
11	44	0.478	26.3
12	44	0.641	38.1
13	44	0.640	38.1

*Example of Standard 1Pack PDF Report*

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## Exporter Type: Ref Dose 1 Pack PDF

**Description:** 1 dosimeters/pouch, routine process monitoring dosimetry with reference position information. All fields in the table below are included in this report.

**Report header setup:** Required. Go to **Setup > Report Headers** and set up the four Fields list in **bold**. Must enter these fields exactly, case sensitive.

<b>FIELD NAME:</b>	<b>DESCRIPTION:</b>	<b>FIELD TYPE:</b>	<b>SPECIAL VALUE FIELD:</b>
Report ID:	Unique name/identifier of the report	Text	
Report Version:	Version number of the report	Whole number	
DSM Batch ID:	Dosimeter batch ID (from Calibration configuration)	Text	
Catalog Number:	Identifying information item being processed	Text	
Prepared by:	Username that is logged in at the time of report processing	Text	
Date and Time:	Date/time report was processed; will say "not processed" for unprocessed report	Text	
Instrument ID:	Spectrophotometer serial number (from Calibration configuration)	Text	
Position:	Dosimeter position (reference, description)	Text	
Carrier:	Carrier number/ID	Text	
Absorbance:	Absorbance measurement of dosimeter 1	Decimal number	
Thickness:	Dosimeter thickness	Decimal number	
Calculated Dose (kGy)	Calculated dose in kGy (uses calibration coefficients in Calibration and Dmin or Dmax ratio)	Decimal number	
Required Dose (kGy)	Required dose according to process specifications	Decimal number	
<b>Min spec</b>	Minimum dose for the process	Decimal number	Min Dose
<b>Max spec</b>	Maximum dose for the process	Decimal number	Max Dose
<b>Ref:Min Ratio</b>	Ratio of min dose to the dosimeter reference position	Decimal number	Ref to Min Ratio
<b>Ref:Max Ratio</b>	Ratio of max dose to the dosimeter reference position	Decimal number	Ref to Max Ratio

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# Dosimetry Report

DSM Calibration ID: P1B3-G30

Report ID: 1234 RefD1pk      Prepared By: Administrator  
 Report Version: 1      Date and Time: Not Processed  
 DSM Batch ID: B3 Film - DA      Instrument ID: Lab G30  
 Catalog Number: A567

Position	Carrier	Absorbance	Thickness	Dose (kGy)
1	1	0.363	0.0185	18.8
2	1	0.590	0.0185	34.3
3	1	0.474	0.0185	26.1
4	1	0.493	0.0185	27.4
5	1	0.640	0.0185	38.1
6	1	0.479	0.0185	26.4

	Reference Dose (kGy)	Carrier	Correlation Factor	Calculated Dose (kGy)	Required Dose (kGy)
Min Dose (kGy)	18.8	1	0.02	0.4	10.0
Max Dose (kGy)	38.1	1	0.02	0.8	70.0

**WARNING! The required minimum dose has not been met.**

Example of Reference Dose 1 Pack PDF Report

## Exporter Type: Ref Dose 2 Pack PDF

**Description:** 2 dosimeters/pouch, routine process monitoring dosimetry with reference position information. All fields in the table below are included in this report.

**Report header setup:** Required. Go to **Setup > Report Headers** and set up the four Fields list in **bold**. Must enter these fields exactly, case sensitive.

FIELD NAME:	DESCRIPTION:	FIELD TYPE:	SPECIAL VALUE FIELD:
Report ID:	Unique name/identifier of the report	Text	
Report Version:	Version number of the report	Whole number	
DSM Batch ID:	Dosimeter batch ID (from Calibration configuration)	Text	
Catalog Number:	Identifying information item being processed	Text	
Prepared by:	Username that is logged in at the time of report processing	Text	
Date and Time:	Date/time report was processed; will say "not processed" for unprocessed report	Text	
Instrument ID:	Spectrophotometer serial number (from Calibration configuration)	Text	
Position:	Dosimeter position (reference, description)	Text	
Carrier:	Carrier number/ID	Text	
Absorbance:	Absorbance measurement of dosimeter 1	Decimal number	
Thickness:	Dosimeter thickness	Decimal number	
Calculated Dose (kGy)	Calculated dose in kGy (uses calibration coefficients in Calibration and Dmin or Dmax ratio)	Decimal number	
Required Dose (kGy)	Required dose according to process specifications	Decimal number	
<b>Min spec</b>	Minimum dose for the process	Decimal number	Min Dose
<b>Max spec</b>	Maximum dose for the process	Decimal number	Max Dose
<b>Ref:Min Ratio</b>	Ratio of min dose to the dosimeter reference position	Decimal number	Ref to Min Ratio

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<b>Ref:Max Ratio</b>	Ratio of max dose to the dosimeter reference position	Decimal number	Ref to Max Ratio
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## Dosimetry Report

**DSM Calibration ID:** P1B3-G30-2

**Report ID:** RD2P      **Prepared By:** Administrator  
**Report Version:** 1      **Date and Time:** Not Processed  
**DSM Batch ID:** B3 Film - DA      **Instrument ID:** Lab G30  
**Catalog Number:** 543

Position	Carrier	ABS 1	ABS 2	Avg.	Thickness	Dose (kGy)
12	44	0.591	0.591	0.591	0.0185	34.4
		0.589	0.588	0.589	0.0185	34.2

	Reference Dose (kGy)	Carrier	Correlation Factor	Calculated Dose (kGy)	Required Dose (kGy)
Min Dose (kGy)	34.2		1.00	34.2	10.0
Max Dose (kGy)	34.4	44	1.50	51.6	50.0

**WARNING! The required maximum dose has been exceeded.**

Example of Reference Dose 2 Pack PDF Report

### 16 APPENDIX 4: Excel Report Data Fields

The DC Export worksheet contains a dosimeter report's exported data from DoseControl. (Excel template is provided by GEX in the installation folder.)

Report ID	Rpt Version	Pathway	DSM Batch	Status	Last Edited By	Last Edited Date	Last Edited Time UTC	Export Date	Export Time UTC							
Minimum Dose	Maximum Dose	Min Dose Spec	Max Dose Spec	Meets Spec?												
Comments																
DosimeterID	Position	TotID	Ao	AI - 1	AI - 2	AI - 3	AI - 4	Thickness	Response	Dose	Corr Fact.	Corrected Dose	CalibrationID	Inst ID	Inst SN	WL (nm)

Data always exported from DoseControl.

Report Header fields. These fields depend on the Admin setup of report headers fields in DoseControl.

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## Data exported from DoseControl software

This table describes the data exported from DoseControl software:

FIELD NAME:	DESCRIPTION:
<b>Report ID:</b>	Unique name/identifier of the report, entered at new report creation
<b>Rpt Version:</b>	Version number of the report
<b>Pathway:</b>	Irradiation pathway for report, selected from configured Pathways
<b>DSM Batch:</b>	Dosimeter batch ID (from Calibration configuration)
<b>Status:</b>	Status of report, processed or incomplete
<b>Last Edited by:</b>	Username that is logged in at the time of most recent report activity
<b>Last Edited date:</b>	Date of most recent report activity
<b>Last Edited time UTC:</b>	Time of most recent report activity, in UTC
<b>Export Date:</b>	Date of report export activity
<b>Export Time UTC:</b>	Time of report export activity, in UTC
<b>Minimum Dose</b>	Minimum dose of the dosimeter batch calibration (from Calibration configuration)
<b>Maximum Dose</b>	Maximum dose of the dosimeter batch calibration (from Calibration configuration)
<b>Min Dose Spec</b>	Minimum dose for the process
<b>Max Dose Spec</b>	Maximum dose for the process
<b>Meets Spec?</b>	Does the measured dose of the dosimeters in report meet the spec? Y/N
<b>Comments</b>	Report comments
<b>Dosimeter ID</b>	Dosimeter ID number, serial number
<b>Position:</b>	Dosimeter position (reference, description)
<b>TotalID:</b>	Tote ID/Carrier number
<b>A<sub>0</sub></b>	Background absorbance measurement (usually 0)
<b>Ai-1</b>	Absorbance measurement of dosimeter 1
<b>Ai-2</b>	Absorbance measurement of dosimeter 2
<b>Ai-3</b>	Absorbance measurement of dosimeter 3
<b>Ai-4</b>	Absorbance measurement of dosimeter 4
<b>Thickness</b>	Dosimeter thickness (from Batches configuration)
<b>Response</b>	Calculated response value $R=(A_i-A_0)/t$ (A <sub>i</sub> is the average of all the dosimeter replicates)
<b>Dose</b>	Measured dose (dose measured by the spectrophotometer)
<b>Correction factor</b>	Correction factor (from Calibration configuration)
<b>Corrected dose:</b>	Dosimeter reading's corrected dose. $Cdose=$ correction factor x measured dose
<b>Calibration ID:</b>	Calibration ID (from Calibration configuration, laboratory provided cal ID)
<b>Instrument ID:</b>	Spectrophotometer name
<b>Inst SN</b>	Spectrophotometer serial number (from Calibration configuration)
<b>Wavelength:</b>	Spectrophotometer set wavelength for measurement (from Calibration configuration)

## Additional Report Header Data Fields

The additional report header data fields section of DC Export is called the Report Headers, as configured by the Admin in DoseControl settings, Report Headers screen. Upon export to Excel, these fields will populate in the same sequence configured in the Report Header setup.

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Report ID	Rpt Version	Pathway	DSM Batch	Status	Last Edited By	Last Edited Date	Last Edited Time UTC	Export Date	Export Time UTC
RD1PK with field1		ebeam1	DA	Incomplete	Administrator	05-Jun-2020	20:08	05-Jun-2020	20:09
Batch Number	G-000034								
Product Quantity	33								
Product Min Dose	5.00								
Product Max Dose	35.00								
Ref to Min Ratio	0.90								
Ref to Max Ratio	1.01								
Minimum Dose	Maximum Dose	Min Dose Spec	Max Dose Spec	Meets Spec?					
31.20	31.20	5.00	35.00	True					
Comments	N/A								

**EDIT FIELDSET: RD1PK default fields**

Exporter Type: Ref Dose 1 Pack PDF

Name: RD1PK default fields

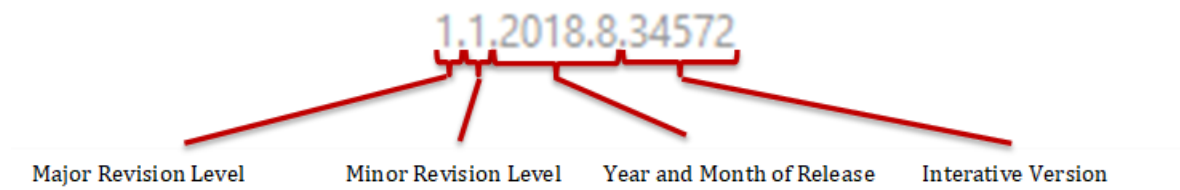
External Id: RD1PK default fields

FIELD NAME	FIELD TYPE	EXTERNAL ID	LABEL	SPECIAL VALUE	SEQUENCE	REQUIRED	IS EDITABLE	ADDITIONAL VALIDATION	DELETE
Batch Number	Text		Batch Number		4	✓	✓	Edit	
Product Quantity Waste	Whole		Product Quantity Waste		5	✓	✓	Edit	
Product Min Dose Spec	Decr		Product Min Dose Spec	Min Dose	6	✓	✓	Edit	
Product Max Dose Spe	Decr		Product Max Dose Spe	Max Dose	7	✓	✓	Edit	
Ref to Min Ratio	Decr		Ref to Min Ratio	Ref to Min	8	✓	✓		
Ref to Max Ratio	Decr		Ref to Max Ratio	Ref to Max	9	✓	✓		

## 17 APPENDIX 5: Validation & Compliance, Software History & Versions

DoseControl software was developed for use on laptop and desktop PCs running Microsoft Windows using the .NET platform. The primary coding language is C#. This software is copyright protected under the laws of the United States of America. DoseControl® is a registered trademark of GEX Corporation.

The development has been version controlled and each new software build is automatically assigned a unique ID number. The version number is shown in the lower right-hand corner of the DoseControl screen at all times. The current formatting of the version number is explained below.



Iterative Version – a unique number that identifies a specific software build. This increasing number is automatically generated by the software that manages the DoseControl application code. Note: This number was 4 digits and with this release it has expanded to 5 digits.

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Year/Month of Release – determined by the date in which the build is assembled by the software development team.

Minor Version – manually issued by GEX when there is a significant addition, reduction or change in functionality.

Major Version – manually issued by GEX. Goes up by one digit when there is a significant change in the overall architecture, user interface, or scope of the software

## Validation and Compliance

GEX has validated the DoseControl system and the associated instructions for installation and operation. The documentation is available for audit at our offices in Palm City, FL U.S.A. or electronic copies may be purchased.

- Compliant with ISO 11137, ISO/ASTM 51275, 51261, 51649, 52628 consensus standards.
- Compliant with electronic records requirements of US FDA 21 CFR, Part 11 with the exclusion of electronic signatures.
- An internal GEX assessment has determined that this software and the lifecycle design comply with all applicable sections of EU Annex 11 with regard to electronic records.

### NOTE

*User responsibilities:* The end-user must follow and abide by the system security and product documentation for the installation, maintenance, and operation of this product in order to be fully compliant with the above listed guidelines.

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## 18 APPENDIX 6: Licensing

This software is for use by licensed operators only. Licensing is provided to each customer in the *GEX Software License Terms and Conditions* document provided to each customer with purchase.

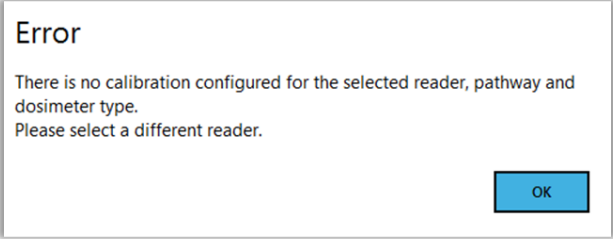
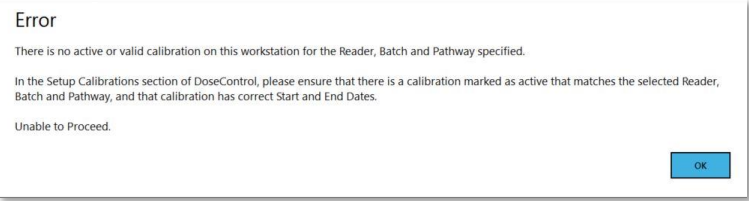
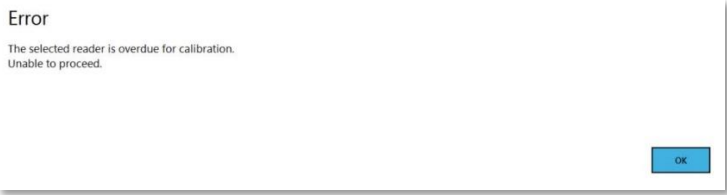
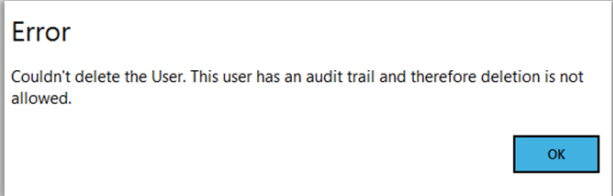
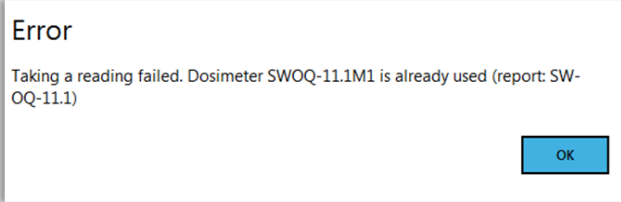
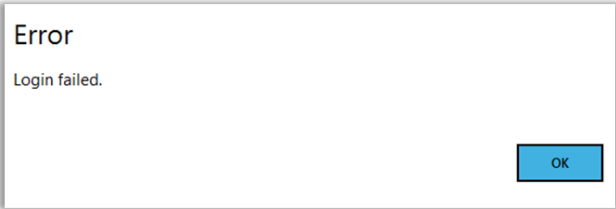
### Open Source and Third-Party Software Licenses

GEX's DoseControl software incorporates certain open source and third-party software components. By ordering, using or installing the DoseControl Software, and pursuant to GEX's Software License Terms and Conditions, you agree to be bound by the terms of the following licenses:

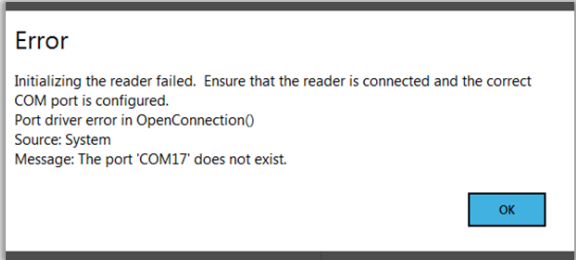

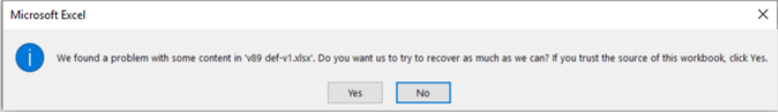
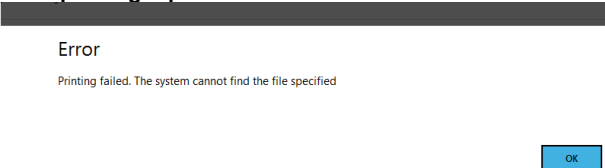
Name	Source	License Link
AsyncEnumerator	MIT	<a href="https://opensource.org/licenses/MIT">https://opensource.org/licenses/MIT</a>
AutoMapper	MIT	<a href="https://github.com/AutoMapper/AutoMapper/blob/master/LICENSE.txt">https://github.com/AutoMapper/AutoMapper/blob/master/LICENSE.txt</a>
CommonServiceLocator	MS-PL	<a href="https://opensource.org/licenses/MS-PL">https://opensource.org/licenses/MS-PL</a>
ef-enum-to-lookup	MIT	<a href="https://opensource.org/licenses/MIT">https://opensource.org/licenses/MIT</a>
EntityFramework	Microsoft	<a href="https://www.microsoft.com/web/webpi/eula/net_library_eula_enu.htm">https://www.microsoft.com/web/webpi/eula/net_library_eula_enu.htm</a>
EPPlus	LGPL-3.0	<a href="https://opensource.org/licenses/LGPL-3.0">https://opensource.org/licenses/LGPL-3.0</a>
Extended.Wpf.Toolkit	MS-PL	<a href="https://github.com/xceedsoftware/wpftoolkit/blob/master/license.md">https://github.com/xceedsoftware/wpftoolkit/blob/master/license.md</a>
Hashids.net	MIT	<a href="https://github.com/ullmark/hashids.net/blob/master/LICENSE.txt">https://github.com/ullmark/hashids.net/blob/master/LICENSE.txt</a>
LinqKit	MIT	<a href="https://raw.githubusercontent.com/scottksmith95/LINQKit/master/license.txt">https://raw.githubusercontent.com/scottksmith95/LINQKit/master/license.txt</a>
MahApps.Metro	MIT	<a href="https://github.com/MahApps/MahApps.Metro/blob/master/LICENSE">https://github.com/MahApps/MahApps.Metro/blob/master/LICENSE</a>
MahApps.Metro.Resources	MIT	<a href="https://github.com/MahApps/MahApps.Metro.Resources/blob/master/LICENSE">https://github.com/MahApps/MahApps.Metro.Resources/blob/master/LICENSE</a>
Microsoft.VisualStudio.SlowCheetah	MIT	<a href="https://raw.githubusercontent.com/Microsoft/slow-cheetah/master/LICENSE">https://raw.githubusercontent.com/Microsoft/slow-cheetah/master/LICENSE</a>
morelinq	Apache	<a href="http://www.apache.org/licenses/LICENSE-2.0">http://www.apache.org/licenses/LICENSE-2.0</a>
Newtonsoft.Json	MIT	<a href="https://raw.githubusercontent.com/JamesNK/Newtonsoft.Json/master/LICENSE.md">https://raw.githubusercontent.com/JamesNK/Newtonsoft.Json/master/LICENSE.md</a>
NLog, NLog.Config, NLog.Schema	BSD 3-clause	<a href="https://raw.githubusercontent.com/NLog/NLog/master/LICENSE.txt">https://raw.githubusercontent.com/NLog/NLog/master/LICENSE.txt</a>
NSubstitute	BSD 3-clause	<a href="https://raw.githubusercontent.com/nsubstitute/NSubstitute/master/LICENSE.txt">https://raw.githubusercontent.com/nsubstitute/NSubstitute/master/LICENSE.txt</a>
Oracle.ManagedDataAccess	Oracle	<a href="http://www.oracle.com/technetwork/licenses/distribution-license-152002.html">http://www.oracle.com/technetwork/licenses/distribution-license-152002.html</a>
PDFSharp	MIT	<a href="http://www.pdfsharp.net/PDFsharp_License.ashx">http://www.pdfsharp.net/PDFsharp_License.ashx</a>
PDFSharp.MigraDoc	MIT	<a href="http://www.pdfsharp.net/MigraDoc_License.ashx">http://www.pdfsharp.net/MigraDoc_License.ashx</a>
Prism.Core, Prism.Mef, Prism.Unity, Prism.Wpf	MIT	<a href="https://github.com/PrismLibrary/Prism/blob/master/LICENSE">https://github.com/PrismLibrary/Prism/blob/master/LICENSE</a>
Rx-Core, Rx-Interface, Rx-Linq, Rx-Main, Rx-PlatformServices	Apache 2.0	<a href="https://github.com/Reactive-Extensions/Rx.NET/blob/develop/LICENSE">https://github.com/Reactive-Extensions/Rx.NET/blob/develop/LICENSE</a>
System.ValueTuple	MIT	<a href="https://github.com/dotnet/corefx/blob/master/LICENSE.TXT">https://github.com/dotnet/corefx/blob/master/LICENSE.TXT</a>
Unity	Apache 2.0	<a href="https://github.com/unitycontainer/unity/blob/master/LICENSE">https://github.com/unitycontainer/unity/blob/master/LICENSE</a>
WindowsAPICodePack	Microsoft	<a href="https://github.com/aybe/Windows-API-Code-Pack-1.1/blob/master/LICENCE">https://github.com/aybe/Windows-API-Code-Pack-1.1/blob/master/LICENCE</a>

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## 19 APPENDIX 7: Troubleshooting

<p><b>Calibration Not Configured</b></p> 	<p>Cause: If there is not a calibration configured or active for the Pathway, Batch, and Reader that is being use, this message will appear.</p> <p>Resolution: Add a configuration or activate a calibration.</p>
<p><b>No Active or Valid Calibration Error</b></p> 	<p>Cause: The dosimeter batch calibration is overdue.</p> <p>Resolution: Re-calibrate the dosimeter batch and activate a valid calibration.</p>
<p><b>Reader Overdue for Calibration</b></p> 	<p>Cause: The spectrophotometer is overdue for a complete performance verification</p> <p>Resolution: Perform the complete performance verification, and go to Setup&gt;Readers&gt;change the 'Next Calibration Date' to a future date for the next performance verification due date.</p>
<p><b>Delete User Error</b></p> 	<p>Cause: If the System Administrator tries to delete a User from the MSSQL User Management module (and that user already has performed an action in the system), then that user cannot be deleted.</p>
<p><b>Duplicate Dosimeter</b></p> 	<p>Cause: If a user tries to scan or enter a Dosimeter ID that already exists in the system.</p> <p>Resolution: Enter a unique Dosimeter ID. System does not allow duplicate IDs.</p>
<p><b>Login Failure</b></p> 	<p>Cause: Incorrect username and/or password.</p>

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<p><b>Open Connection( ) or Port Driver Error</b></p> 	<p>Cause: Indicates a physical disconnect between the reader and the software.</p> <ul style="list-style-type: none"> <li>• Check that the spectrophotometer is connected to the PC (G30 home screen &gt; Settings &gt; Connect to PC)</li> <li>• Check to see if the correct COM port and baud rate are configured in Reader setup.</li> <li>• Check to see if the reader USB cable is disconnected or plugged into an incorrect port.</li> </ul>
<p><b>Reader not responding</b></p> 	<p>Cause: Indicates a disconnect between the reader and the software.</p> <ul style="list-style-type: none"> <li>• Ensure the spectrophotometer USB cable is connected to the PC.</li> <li>• Check that the spectrophotometer is connected to the PC (G30 home screen &gt; Settings &gt; Connect to PC)</li> <li>• For G30 and Evo users: Ensure the Reader baud rate is set to 115200 and the Device Manager properties for the instrument is also 115200.</li> <li>• For G20 users: Ensure the Reader baud rate is set to 9600 and the Device Manager properties is also 9600.</li> </ul>
<p><b>Error for MS Excel report</b></p> 	<p>Cause: An error message like this screenshot indicates a problem with the Excel template that is uploaded to DoseControl.</p> <p>Resolution: Open the Excel template file and check each tab for errors in formulas.</p>
<p><b>Error message: 'You don't have permission to save in this location'</b></p>	<p>Cause: Windows permission issue.</p> <p>Resolution: Contact your IT administrator to obtain permission. This issue particularly occurs when you try to save Office 2010 or Office 2007 documents in Windows 10, Windows 8 or Windows 7.</p> <p><a href="https://youtu.be/HeARH0JrWnc">https://youtu.be/HeARH0JrWnc</a></p>
<p><b>Error printing report file</b></p> 	<p>Cause: The report file has been moved from the configured storage location or is blocked due to a change to the user's network.</p> <p>Resolution: Contact your IT administrator.</p>
<p><b>Evolution Slit Wheel Error</b>  Error message: 'IReader Method: SetSpectralBandwidth_SLIT1 N/A Message: Motor not homed, position undefined (reader command: SLIT1, error type: MotorUnhomed) Code:2&gt;SLIT-1 -6'</p>	<p>Error message can be for SLIT1 or SLIT2.  Cause: The Evolution reader needs to be repaired.</p> <p>Resolution: Contact GEX Customer Support, or Thermo if you have purchased the reader directly from Thermo.</p>

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## 20 APPENDIX 8: Customer Support

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### IMPORTANT

To help GEX Support provide the best service, please make a copy (screen capture) of any error messages and be able describe the details of your issue.

#### **GEX Customer Support by Web (fastest response)**

General Support information

<https://www.gexcorp.com/support.html>

Request assistance & submit a support ticket for DoseControl software

<https://gexcorp.atlassian.net/servicedesk/customer/portal/2>

GEX document library

<https://library.gexcorp.com/>

#### **GEX Customer Support by Phone**

Office hours: Monday – Friday, 8am to 5pm GMT-7 November through March, GMT-8 April through October.

Email: [cs@gexcorp.com](mailto:cs@gexcorp.com)

Phone: +1 303-400-9640

#### **GEX Customer Support by Email**

Email: [cs@gexcorp.com](mailto:cs@gexcorp.com)

#### **Formal correspondence**

GEX Corporation

Attn: Customer Service

7330 S. Alton Way, Suite 12i

Centennial, CO 80112 U.S.A.

Office: +1 303 400-9640

Fax: +1 303 400-9831

Website: <https://www.gexcorp.com/support.html>

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