

MFG463684

# Joint Effort: Vault and Fusion Lifecycle as the new dream couple

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coolOrange



## Learning Objectives

- Discover the out-of-the-box capabilities of powerFLC
- Understand the architecture and the different components of powerFLC
- Learn how to create custom workflows to transfer data between Vault and FLC
- Discover a variety of real-world use cases and the benefits for customers

## Description

When used together, Vault Professional software and Fusion Lifecycle software provide a combined solution that is the best of all worlds for product data management (PDM) and product lifecycle management (PLM). While Vault runs on-prem to keep your CAD data safe behind your firewall, Fusion Lifecycle is cloud-based for flexibility and ease of deployment. With powerFLC (Vault to Fusion Lifecycle connector) coolOrange offers an easy to use and flexible tool to combine Fusion Lifecycle and Vault processes. Previous versions of powerFLC were shipped with predefined workflows and with the latest version of powerFLC it is even possible to create custom workflows to synchronize any data between Vault and Fusion Lifecycle. This class demonstrates the advantages of using both products together and shows some of the endless possibilities of this integration.

## Speaker

Christian Gessner is a co-founder and Technical Evangelist at coolOrange. In this role, he helps customers and resellers to use the right technology and tools to successfully design, implement and customize Autodesk data management solutions. He has over 15 years of experience in software development with a focus on Autodesk data management products and Microsoft development technologies. Prior to coolOrange, Christian was member of the data management software engineering team at Autodesk.



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## Basics

### Connections

powerFLC uses *Autodesk Forge* to establish the communication between Vault and Fusion Lifecycle. More precisely, the communication is based on the Autodesk Forge NuGet package: <https://www.nuget.org/packages/Autodesk.Forge/>

### HTTP Requirements

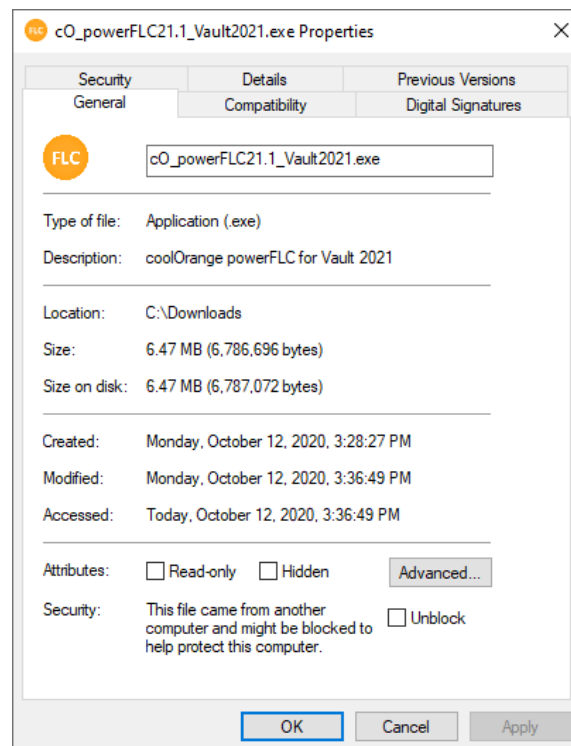
*Transport Layer Security* (TLS) 1.2 must be activated on the Job Processor machine to establish a connection to Forge and Fusion Lifecycle. TLS 1.2 is enabled by default on the latest Microsoft operating systems such as Windows 10.

### Download

The latest version of powerFLC can be downloaded from the coolOrange download portal: <http://download.coolorange.com/>

### Unblock

Depending on network and security policy settings, the downloaded file may be blocked by Windows. If this is the case, open the file properties of the downloaded installer package, enable the “Unblock” checkbox and apply the changes with “Apply” or “OK”:



*Note: The file can also be unblocked by using a PowerShell command:*

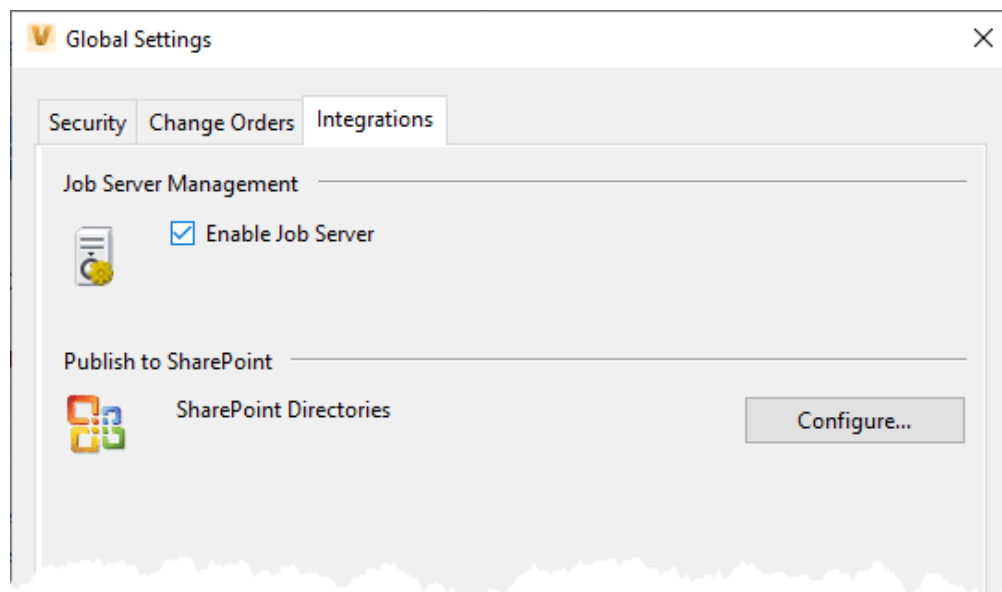
<https://docs.microsoft.com/en-us/powershell/module/microsoft.powershell.utility/unblock-file?view=powershell-6>

*Command:*

Get-Item "C:\c0\_powerFLC21.1\_Vault2021.msi" | Unblock-File

**Pre-requisites**

powerFLC workflows that are based on *powerJobs Processor* are using the *Autodesk Vault Job Processor* as a host to exchange data between Vault and Fusion Lifecycle. The option “Enable Job Server” has to be checked in the Vault settings to enable the Vault Job Processor functionality:



VAULT GLOBAL SETTINGS: “ENABLE JOB SERVER”

*More detailed information about the concept of the Vault Job Processor can be obtained from:*

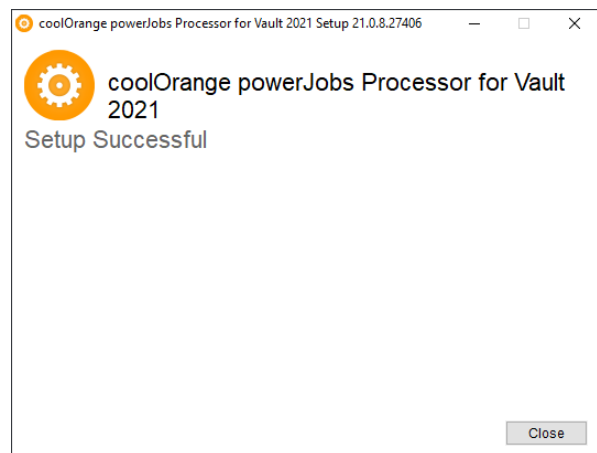
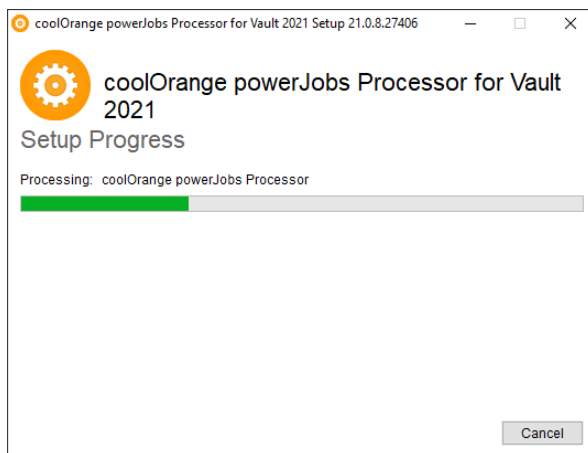
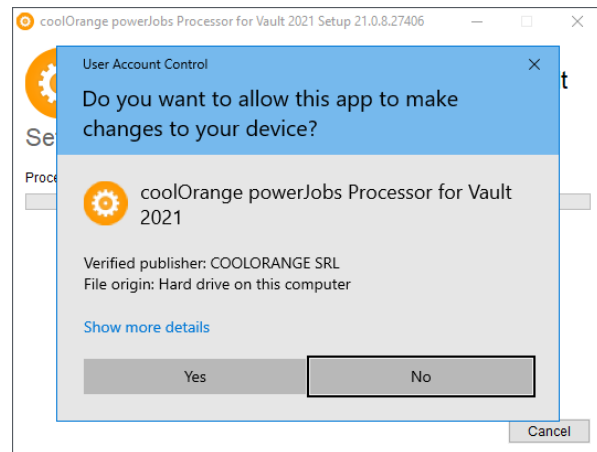
<https://knowledge.autodesk.com/support/vault-products/learn-explore/caas/CloudHelp/cloudhelp/2015/ENU/Vault/files/GUID-DAE28A42-45C3-4501-9BF2-78EE2F42808D-htm.html>

*powerFLC is hosted by powerJobs Processor. For that reason, powerJobs Processor must be installed prior to the powerFLC installation.*

### powerJobs Processor Installation

The setup can be started by executing the downloaded installer package exe-file. All settings are pre-configured, an installation wizard guides through a very straight forward installation process:

1. License Agreement page: Agree the license terms and conditions and click “Install”
2. User Account Control Dialog: click “Yes”
3. Setup Progress page: Wait for the installer
4. Confirmation page: click “Close”

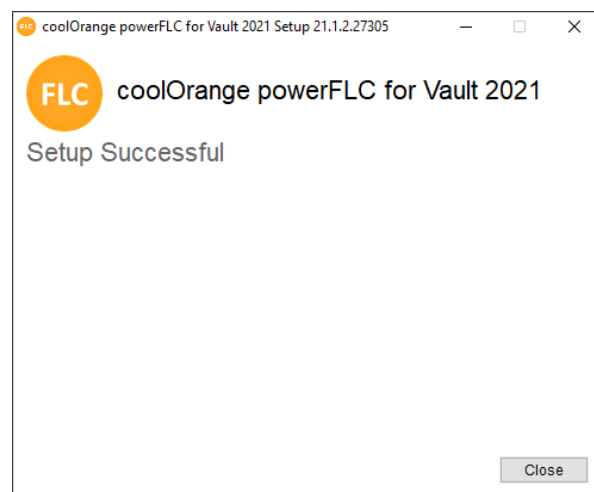
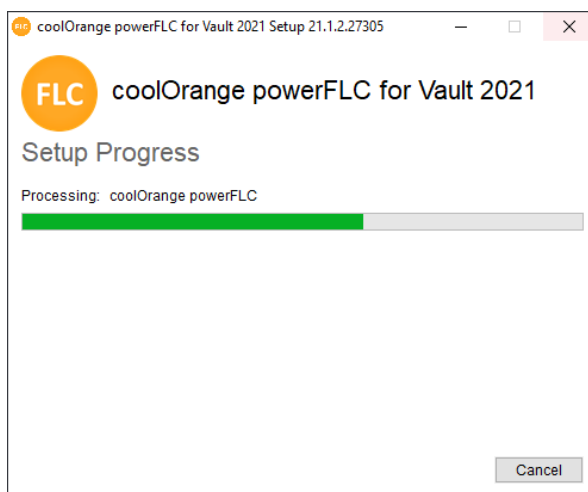
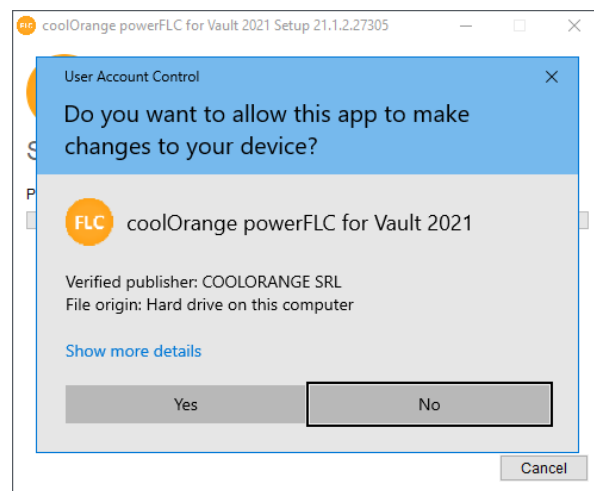


## powerFLC Installation

The setup can be started by executing the downloaded installer package exe-file (e.g. cO\_powerFLC21.1\_Vault2021.exe).

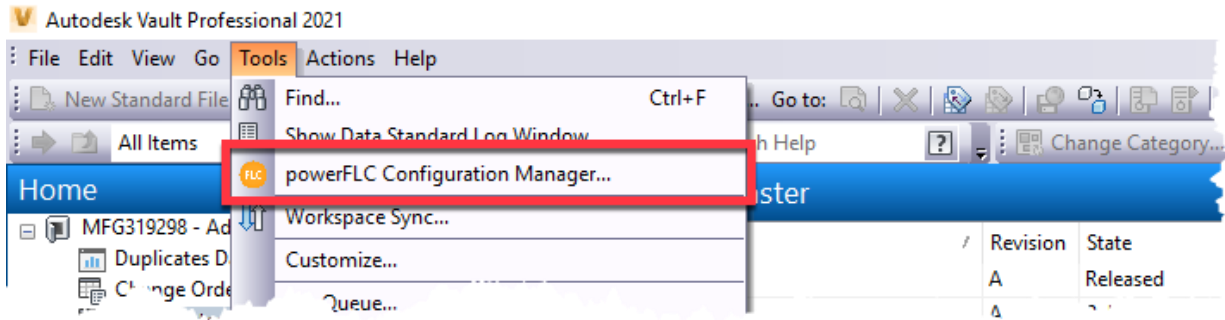
All settings are pre-configured, an installation wizard guides through a very straight forward installation process:

5. License Agreement page: Agree the license terms and conditions and click “Install”
6. User Account Control Dialog: click “Yes”
7. Setup Progress page: Wait for the installer
8. Confirmation page: click “Close”



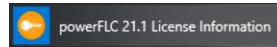
Once installed, the menu button “*powerFLC Configuration Manager...*” can be found in the Vault Explorer tools menu:





## Licensing and Activation

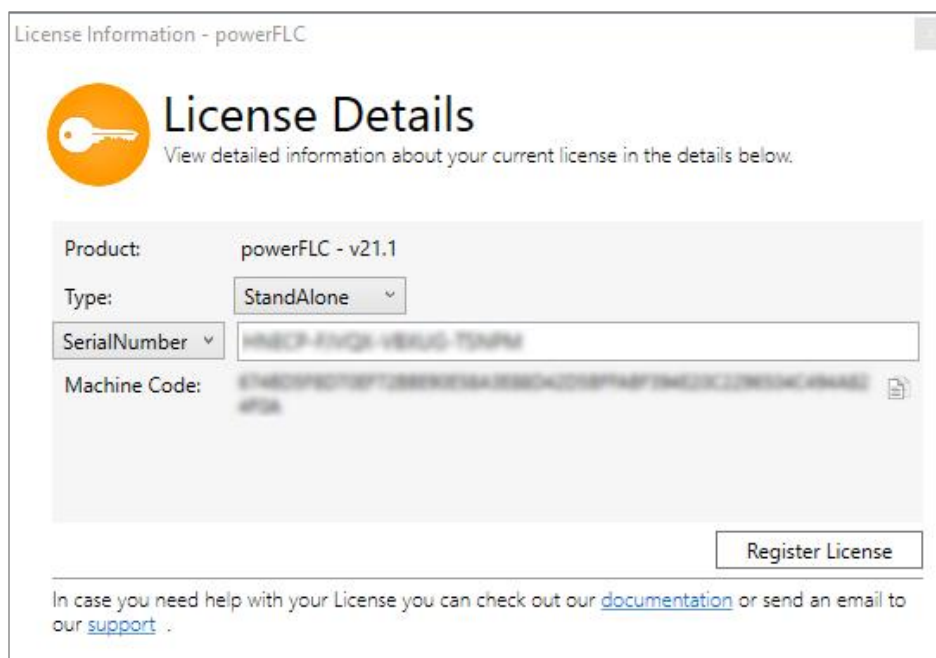
To activate powerFLC, a serial number needs to be provided. To enter the serial number, the License activation utility must be started from the start menu:




or by executing the exe file located at:

*C:\Program Files\coolOrangeModules\powerFLC\License.exe*

Once started, the serial number must be entered and submitted with “Register License”:



License Information - powerFLC

 **License Details**  
View detailed information about your current license in the details below.

Product: powerFLC - v21.1

Type: StandAlone

SerialNumber: [Input field containing a serial number]

Machine Code: [Input field containing a machine code]

In case you need help with your License you can check out our [documentation](#) or send an email to our [support](#).

LICENSE REGISTRATION UTILITY

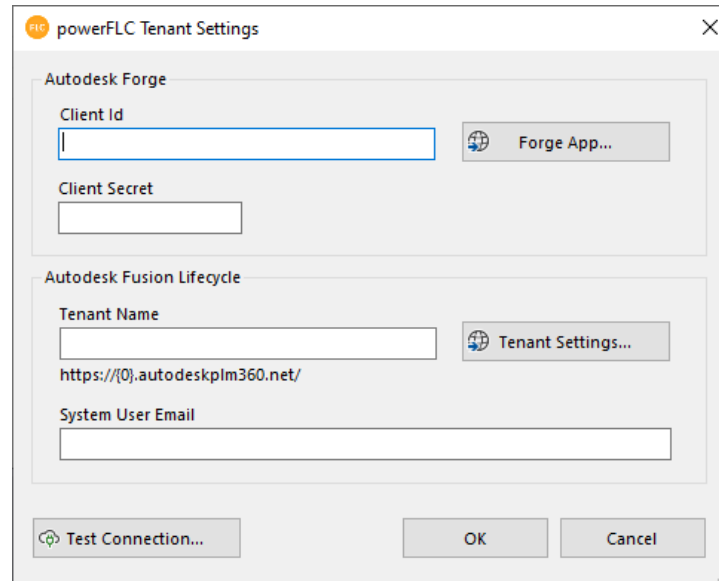
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*To request a trial license or to purchase powerFLC or any other product from coolOrange, please contact [sales@coolorange.com](mailto:sales@coolorange.com)*

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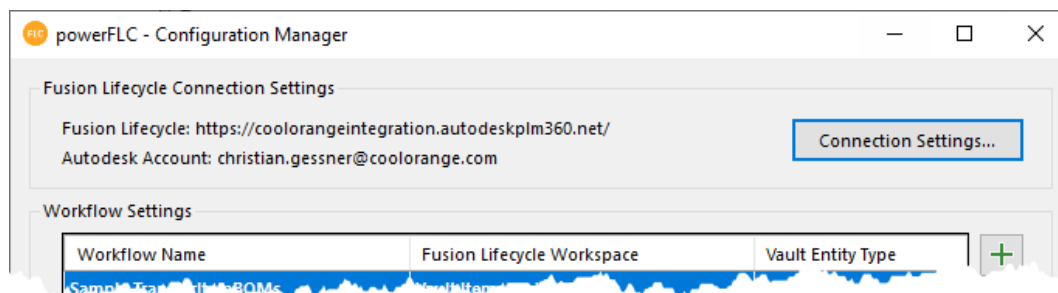


When launched the first time, a dialog appears to gather the information needed to connect to Fusion Lifecycle:



TENANT SETTINGS IN THE CONFIGURATION MANAGER

This dialog can also be exposed using the “Connection Settings...”-button in the *Configuration Manager* dialog:



## Forge App

For powerFLC to communicate with Fusion Lifecycle, a common platform is necessary that can be used by powerFLC and that is trusted by Fusion Lifecycle. This common platform is Autodesk Forge's *Authentication (OAuth) API*.

To get access to the Auth API a Forge app must be created:  
<https://forge.autodesk.com/en/docs/oauth/v2/tutorials/create-app/>

When creating a new app in Forge, the following information has to be provided:

Name	Description
APIs	At least one API must be chosen. None of the selected APIs will be used by powerFLC but only the Authentication API that is always available, independent of the selection
Name	Any name can be chosen
Description	Any description can be chosen
Callback URL	A valid URL must be provided. E.g. <a href="https://localhost">https://localhost</a> . This URL won't be used by powerFLC since this is only needed for 3-legged authentication

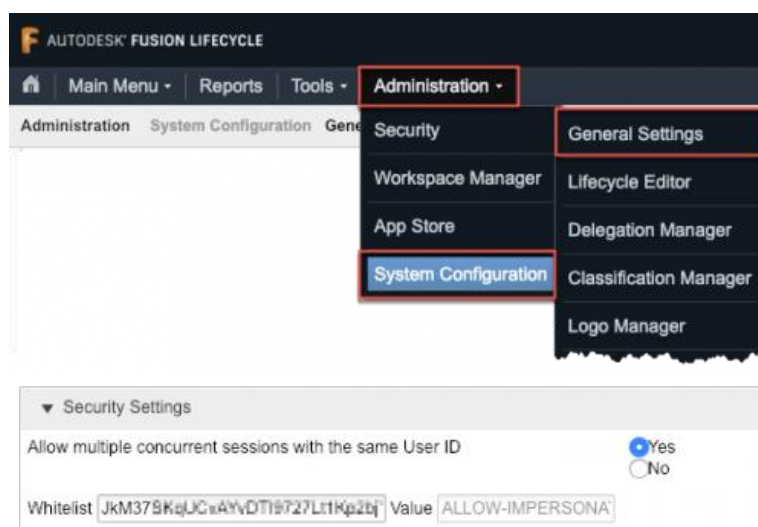
Once created, it provides a **Client ID** and a **Client Secret**.

## Fusion Lifecycle Whitelist

powerFLC uses Forge's 2-legged authentication to communicate with Fusion Lifecycle.

In order for Fusion Lifecycle to allow 2-legged authentication, the Forge Apps Client ID needs to be added to the whitelist in Fusion Lifecycle.

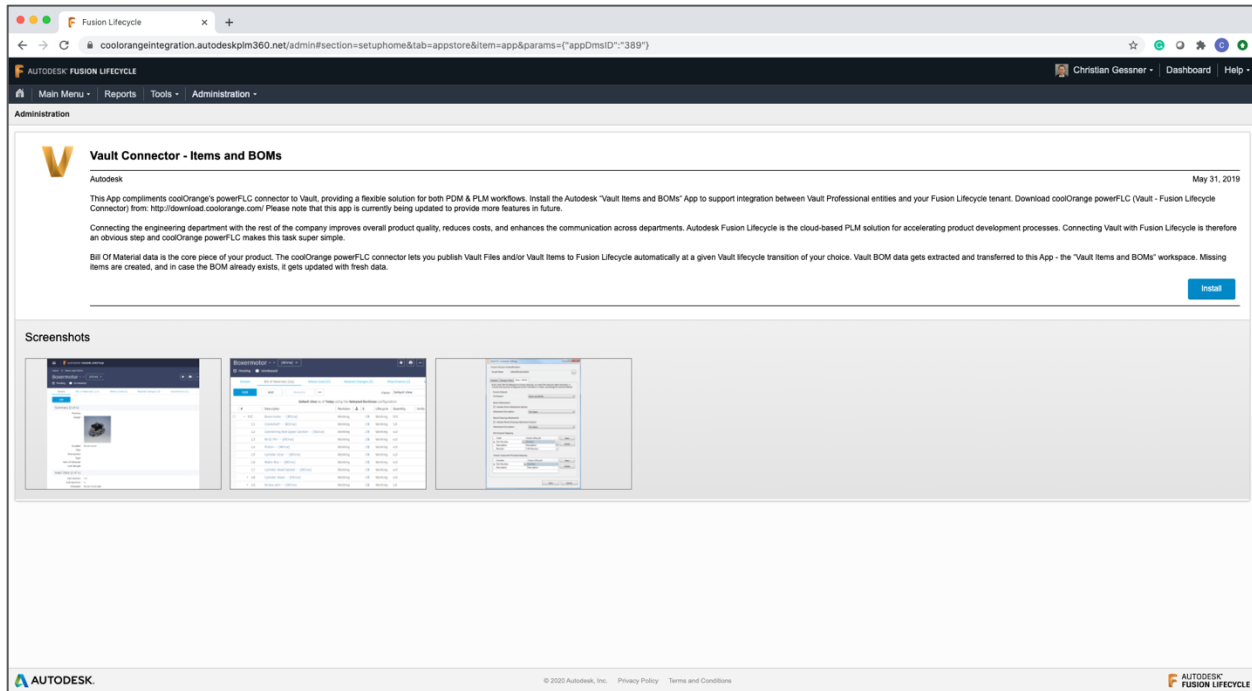
The whitelist can be modified in the *Security Settings*:  
*Administration -> System Configuration -> General Settings*



SECURITY SETTINGS - WHITELIST

## Fusion Lifecycle App Store Workspace

There is a special workspace available in the Fusion Lifecycle *App Store* that provides all necessary fields and configuration for the *Items and BOMs* workflow of powerFLC:



FUSION LIFECYCLE APP STORE: WORKSPACE FOR THE ITEMS AND BOMS WORKFLOW

To add this workspace to Fusion Lifecycle, "Install" needs to be clicked. After the installation, the necessary permissions have to be granted and the menus have to be adjusted in order to make this workspace visible.

## Out-of-the-box Capabilities

powerFLC is a highly configurable and customizable solution that connects Autodesk Vault with Autodesk Fusion Lifecycle. It is completely based on PowerShell commands (Cmdlets) and ships with a configurable sample workflow.

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*Note:*

*More information about Microsoft PowerShell Cmdlets can be found here:  
<https://docs.microsoft.com/en-us/powershell/scripting/developer/cmdlet/cmdlet-overview?view=powershell-7>*

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### powerFLC PowerShell Cmdlets

The foundation of powerFLC is a set of PowerShell Cmdlets that provides functionality to connect to Fusion Lifecycle, read, write and update item details and BOM information from and to Fusion Lifecycle as well as upload attachments to FLC items.

Detailed information about the powerFLC cmdlets will be discussed later in this document.

The cmdlets can be executed from any application that is able to execute PowerShell (e.g. Microsoft Windows PowerShell ISE or Visual Studio Code). In order to execute the commands in the context of Vault, coolOrange powerJobs Processor must be used. Each powerFLC license contains a powerJobs Processor license.

### powerFLC Configuration Manager

In order to allow administrators to adjust the workflows that are executed in a PowerShell environment, a Configuration Manager is available that allows to change settings and mappings in a graphical user interface rather than in a PowerShell script file.

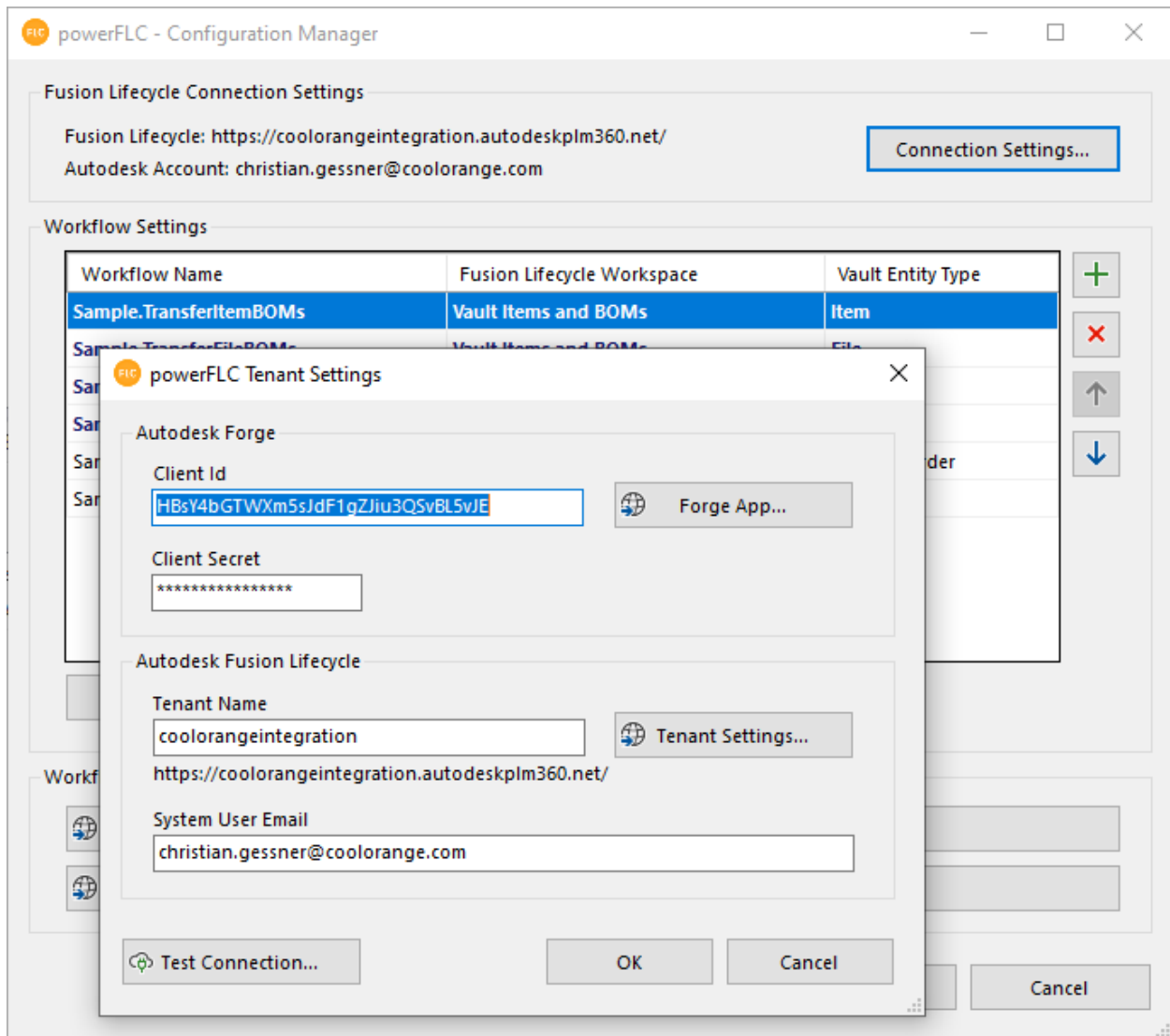
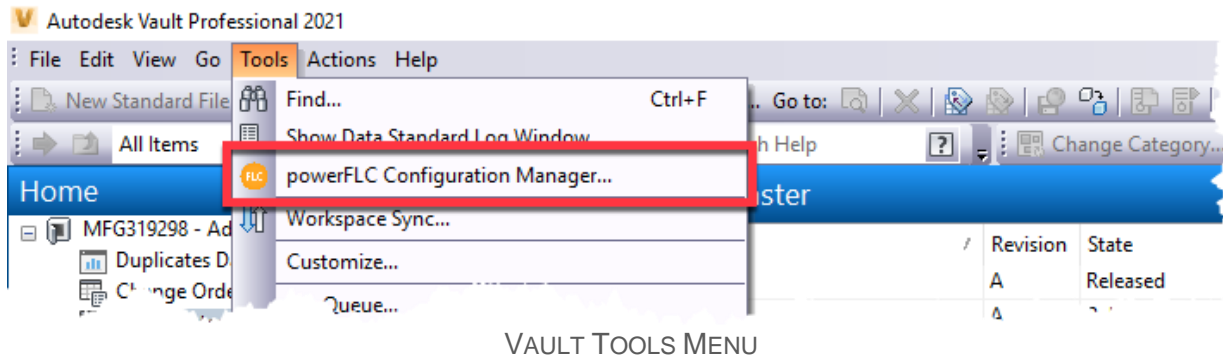
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*Note:*

*The Configuration Manager is not necessarily needed, since all settings can also be hardcoded to the PowerShell script file. However, the sample workflows are using this functionality to make the configuration seamless and easy.*

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The powerFLC Configuration Manager can be launched from the Vault Tools Menu:



POWERFLC – CONFIGURATION MANAGER

## Sample workflow: Item centric BOM transfer

The sample workflow that ships with powerFLC transfers Vault Item and Bill of Material information to Fusion Lifecycle and is not only meant to be a sample but can also be used out-of-the-box. Several workflow options and mappings are available to adjust the workflow to the customer's needs.

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*Note:*

*the Item centric BOM transfer workflow has been developed in collaboration product managers from Autodesk. It uses the latest Vault and Fusion Lifecycle functionality and is Autodesk's recommended way to transfer item and BOM information from Vault to Fusion Lifecycle.*

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## Additional Materials

### Workflow samples

In addition to the samples that are installed by the powerFLC installer, there are other samples available online: <https://github.com/coolOrangeLabs/powerflc-samples>

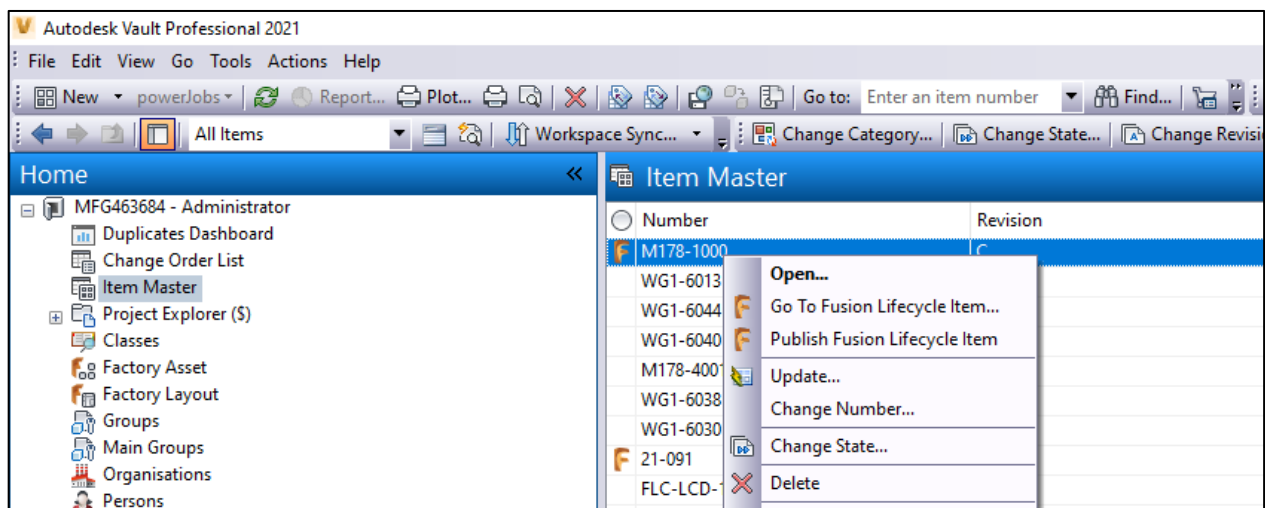
### Product documentation

<https://www.coolorange.com/wiki/doku.php?id=powerflc>

[https://www.coolorange.com/wiki/doku.php?id=powerjobs\\_processor](https://www.coolorange.com/wiki/doku.php?id=powerjobs_processor)

### Vault UI Extension

In order to interact with Fusion Lifecycle from within Vault a Vault Explorer Extension is available that extends the Vault Item and BOM workflow by introducing a context menu to the Vault items with commands to Navigate to the corresponding Fusion Lifecycle item and to publish the Vault item to Fusion Lifecycle:



VAULT UI EXTENSION

The sources can be downloaded from GitHub:

<https://github.com/coolOrangeLabs/powerflc-explorer-extension>

There are also compiled version available as MSI installers for different Vault versions:

<https://github.com/coolOrangeLabs/powerflc-explorer-extension/releases>

## AU 2020 Classes

### **Rapid Fusion Lifecycle Deployment When Time Is of the Essence**

**Author**

Vahid Zohrehvandi

**Description**

Fusion Lifecycle software can be deployed faster than any other PLM (product lifecycle management) tool on the market. This was tested for a company that wanted to take its ventilator project to production in the shortest time possible due to the COVID-19 ventilator shortage. A prototype of the ventilator was completed using Fusion 360 software. Now it is time to take it into mass production using Items and BOMs, ECO, and NPI Workspace of Fusion Lifecycle.

### **Shift Your Change Processes to a Higher Gear with Fusion Lifecycle**

**Author**

Peter Van Avondt

**Description**

Effective change management is critical to deliver your products and projects on time, with the right quality and within budget. Throughout the product lifecycle many changes can happen. Change management isn't just for engineering and manufacturing but also other stakeholders such as suppliers, service, and so on. In this class you will see how Fusion Lifecycle software can help you take control of change by offering a collaborative environment where product changes are fully defined, reviewed, approved, and implemented. We will show you the out-of-the-box workflows and see how we can easily extend them to respond to change requests in time, quickly discover and assess the scope of changes, learn the complete change history log, and manage team activities in context of your change activities.

### **Managing Bills of Materials: The Recipe for Your Product Design**

**Author**

Brian Schanen

**Description**

Your bill of materials (BOM) is the DNA of your product—how are you managing it? It's OK if you say Microsoft Excel—we can meet you where you are. In this session, you will learn about the proper care and feeding of your BOM, how to prevent using the wrong vendor to source your components, the evolution of the BOM, comparison and markup—what's changed, and how to see the history. The past, present, and future of your product's bill of materials.

## AU Online Classes

### **PDM and PLM United: Vault Fusion Lifecycle Connector—a Zero-Code Connector**

**Author**

Christian Gessner

**Description**

When used together, Vault Professional software and Fusion Lifecycle software provide a combined solution that is the best of all worlds for product data management (PDM) and product lifecycle management (PLM). While Vault runs on-premise to keep your CAD data safe behind your firewall, Fusion Lifecycle is cloud based for flexibility and ease of deployment. Sadly, this has made a seamless integration between the two difficult—until now. This class describes the benefits of the Vault Fusion Lifecycle Connector, including installation, configuration, and extensibility, so you can create a best-of-all-worlds solution.

**Link**

<https://www.autodesk.com/autodesk-university/class/PDM-and-PLM-United-Vault-Fusion-Lifecycle-Connector-Zero-Code-Connector-2019>

### **Fusion Lifecycle: The Future's So Bright We Gotta Wear Shades**

**Author**

Curtis Schmidt

**Description**

Learn how to increase efficiency and traceability of your design review and approval processes. This class will show how Fusion Lifecycle software coupled with Vault software will address inefficiencies in existing processes at Dynamic Attractions. This includes a shift from project-based systems to product-based systems. We'll show why a clean-slate approach is needed to align our CAD, Vault, and Fusion Lifecycle data with a new material requirement planning (MRP) system. We'll explain why we plan to only migrate some cleansed library and product data. We'll also cover how we have overcome the cultural hurdles and barriers to improvements; we're excited to finally move forward with a product lifecycle management (PLM).

**Link**

<https://www.autodesk.com/autodesk-university/class/Fusion-Lifecycle-Futures-So-Bright-We-Gotta-Wear-Shades-2019>

## **Bring It All Together: The Fusion Between PDM and PLM**

### **Author**

Peter Van Avondt

### **Description**

Vault product data management (PDM) software helps designers and engineers better organize design data, enhance documentation management, and streamline revision processes of their product data. Product data is not exclusively used by development teams but should also be available outside the engineering department. On the other hand, the engineers require data from upstream processes such as sales orders and specifications. And that's where a product lifecycle management (PLM) system like Fusion Lifecycle software comes into the play. Fusion Lifecycle serves as a company-wide information source for activities before, during, and after development actions, supported by automated processes. In this class, we will have a look at how both worlds (PDM and PLM) can be tied together to streamline the workflows throughout the whole product development cycle.

### **Link**

<https://www.autodesk.com/autodesk-university/class/Bring-It-All-Together-Fusion-Between-PDM-and-PLM-2019>