MFG463558

Reduce the Number of Component Setups using Multi-Axis Machine Tools

Simon Taylor
Cadline Ltd

Learning Objectives

- Learn how using Multiaxis machines can save time and money
- Discover what can be achieved by using Cad/Cam to program these machines
- Learn how to increase profit and save money

Description

Using a multiaxis machine tool is a great method for reducing the machining time when manufacturing components. This presentation will give an overview of how this software can speed up the process of programming multiaxis computer numerical control (CNC) machines to manufacture complex components. The focal point of this presentation will be showing how CAM can simplify the machining of complex components, while minimizing mistakes in the process and increasing productivity.

Speaker(s)

I am an application engineer at Cadline. I specialize in Cad/Cam solutions using Autodesk Inventor, Fusion 360, FeatureCAM and PowerMill. I have a wide knowledge of different manufacturing methods gained over 28 years working in a variety of different industries. I have also worked in the machine tool industry where I worked on a variety of projects from small business up to multi-national companies where I looked at picking the right machine for the parts customer was wanting to manufacture. Also, in this role I had to look at Tooling, Workholding/Fixturing and Time Studies to ensure we could deliver time savings on the solutions offered. In my spare time I enjoy cycling, going to the cinema and long walks with my dogs.

Introduction

This industry talk provides some insight into how and why using multi-axis machine tools can save time and money when compared with using standard cnc machinery. We will look at how we can identify how many operations would be needed to machine a part before we even cut any metal. We will also be showing how using a Cad/Cam package can save time with programming more complicated parts.

This handout with give a better understanding of some of the benefits of looking at multi-axis machines and how they are not as daunting to program as you might think using modern Cad/Cam systems.

Why look at multi-axis machines?

It is a very good question and depending on your company and the parts you make, there might be different answers to the question.

Are you getting more complicated parts to machine, which are getting tighter tolerances which you have trouble meeting?

Machines taking longer to setup parts due to having multiple fixture setups?

Need to utilize your number of hours for the week and are looking at unmanned running overnight?

Want to save money with fixturing costs and reduced setups?

If some of these answers sound familiar, it's because a lot people are looking at how they can bring their costs down by using the latest cnc machine technology and reducing the number of different setups/operations required to machine a part.

The latest CNC machines might have a few more tricks up their sleeves with what they can do and programming them is straightforward with the latest Cad/Cam systems.

Why use a Cad/Cam system?

A lot of customers now provide 3D models along with their drawings for parts which need to be manufactured. It is a lot quicker to load a 3D model into a Cad/Cam system and create toolpaths for components.

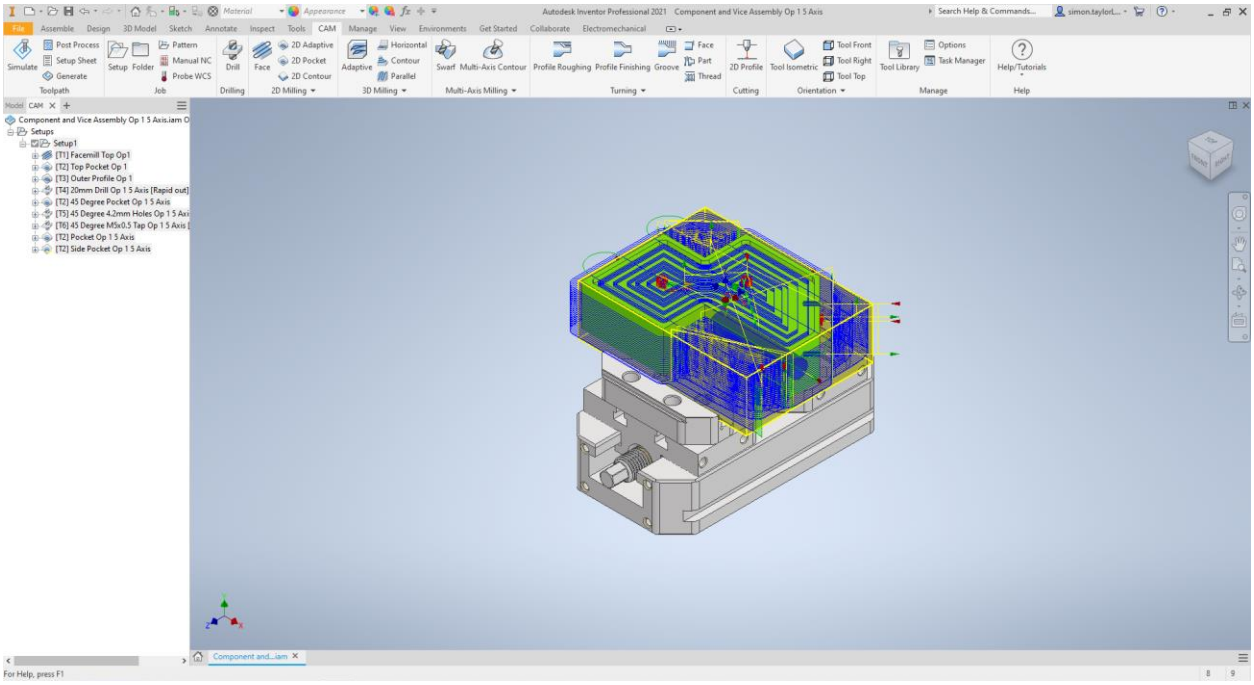
It also means that instead of programming machine directly off the controller which with some machines means you cannot be running a G-Code program at the same time. Other benefits include having a variety of different toolpath strategies available for machining more demanding components.

There is also the capability to program a variety of different machine tools from VMC/HMC, Turn, Mill/Turn, Wire EDM, Laser and Routers. This means that you can program most machines you would ever need to.

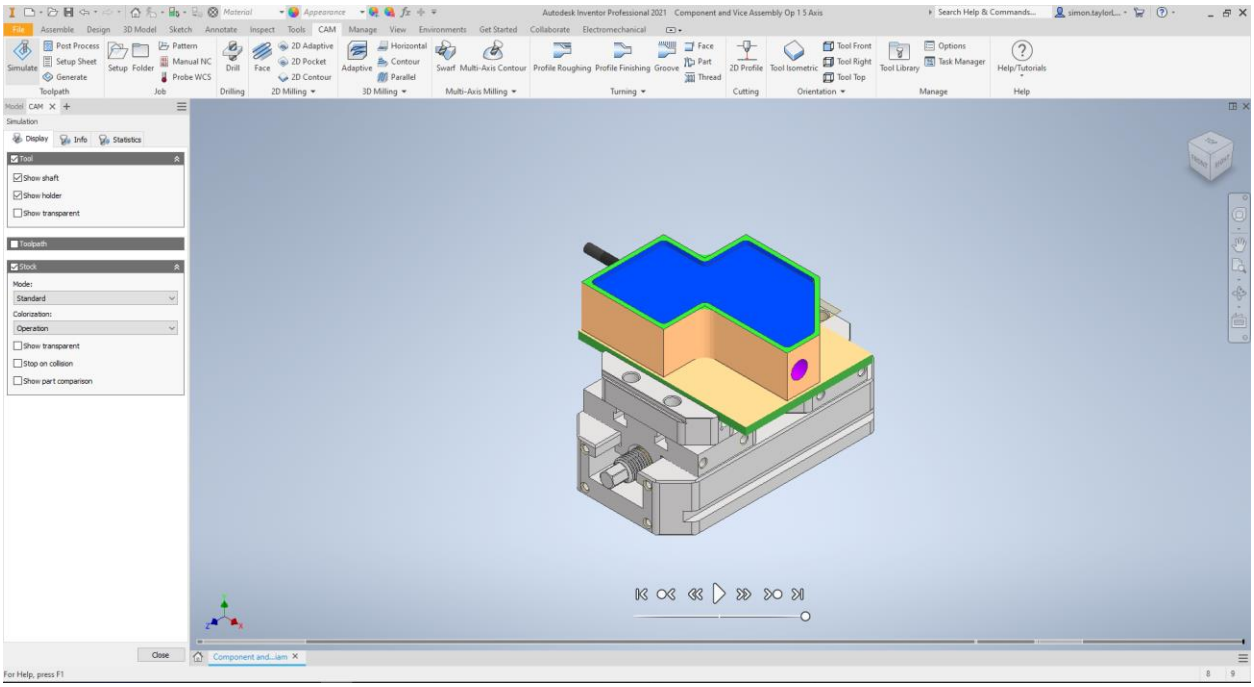
You can program a part once and if you need to change the machine its running on, you can reprocess your Cad/Cam session and change the Post Processor to the controller of the CNC machine your transferring the part to.

Below is an example of a Cad/Cam package.

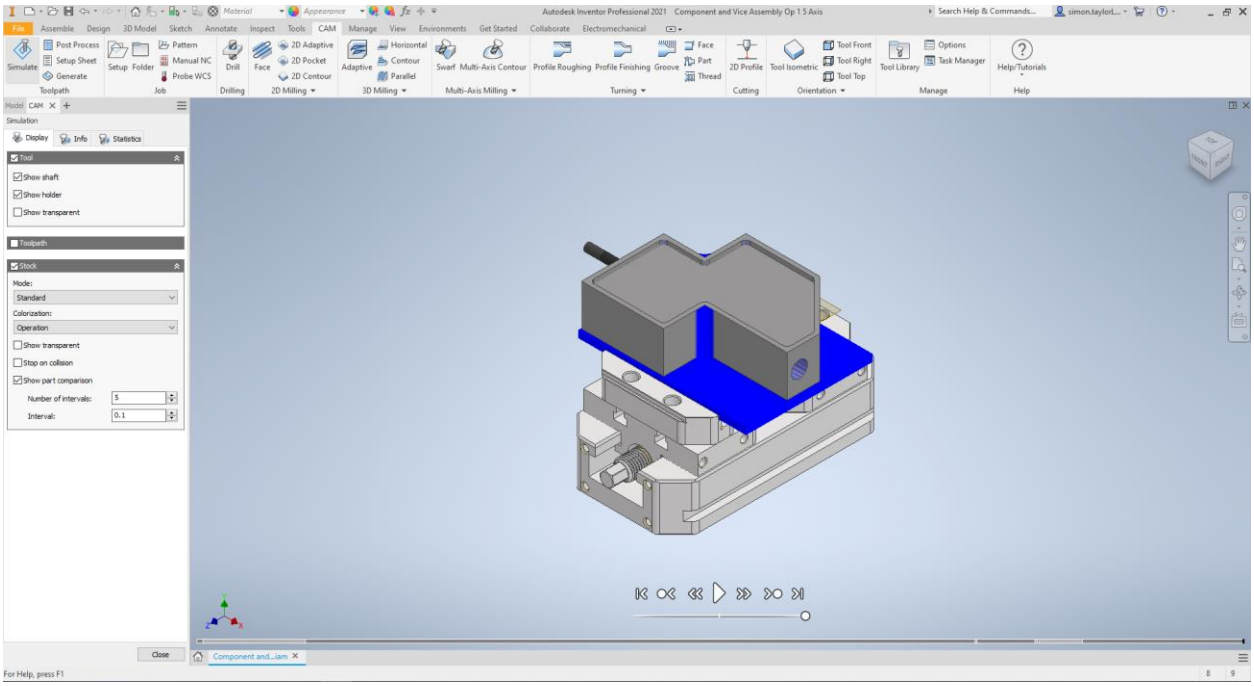
This is Autodesk Inventor Cad software working with a Cam add-in called InventorCAM.



We can apply machining strategies on a 3D Model and then run a simulation to ensure it is giving us the results we would expect, see below: -



We can even see where excess material might still be on the part, see below: -



As you will see with the presentation there is a lot of that both multi-axis machines and Cad/Cam can bring to the table.

Conclusion

Understanding what new machinery and software solutions can bring to the world of manufacturing is a big subject. With this presentation I have tried to simplify how we can look at making components, but with what is being shown can be scaled to machining much bigger and even more complicated parts.