VICI
Virtual Inventory Communications Interface
1.1. Application Overview

DEFEND3D is a patented secure transmission service for remote data streaming. Our security protocol provides end to end protection by keeping the original Gcode file on the source PC/server allowing you to utilise virtual inventory to manufacture parts in remote locations without any file transfer in the process.

All manufacturing jobs are recorded in detail, providing an audit trail throughout the entire digital supply chain. Variables such as device settings, type of device, type of material, etc. can be set to enforce manufacturing standards and to ensure the highest quality in the production process.

1.2. Software Breakdown

The DEFEND3D ecosystem is broken down into three high-level software components for the end user, used within the Virtual Inventory Communications Interface, VICI.

**VICI Box**
Software application to provide UI to securely share Gcode files to the VICI Server.

**VICI**
Software application to provide UI for retrieving and streaming Gcode files from the VICI Server.

**VICI Database**
Management of encrypted files, access rights and functionality.
The VICI Suite

2.1. Introduction

Within the VICI Suite, comes the ability to create and manage an array of Virtual Inventory within your organisation. This comprehensive database application is easily structured and arranged logically for optimal use within your organisation for simple management and storage of digital asset files.

The VICI Suite starts with 1 department with the option to upgrade at any time. Within the department, multiple catalogues can be created and from there, unlimited contributors can be invited and assigned to specific or multiple catalogues with the ability to populate and print through the VICI applications.

The VICI Suite consist of the following roles with the ability for Super Administrator to upgrade the number of Department Administrators at any time. With each new Department Administrator, comes the option to add a new department within your organisation.

- 1 x Super Administrator
- 1 x Department Administrator
- Unlimited Contributors

2.2. Licenses

In total, the VICI Suite subscription contains the following, with 1 instance of each VICI application assigned to the Super Administrator by default. Each license allows the successful installation of the VICI application on a new machine and is linked against user credentials.

- 2 x VICI Box Licenses
- 2 x VICI Print Licenses
- Unlimited Contributors
Roles and Responsibilities

3.1. Super Administrator

Your organisation is equipped with the role of a Super Administrator to handle permissions and overall management. At all times, the Super Administrator has full control over the organisation subscription with the ability to upgrade, downgrade, or create a custom plan at any time.

To begin, the role of the Super Administrator is to create a department within the organisation and assign a Department Administrator accordingly. From there, the Super Administrator has full access and control over all Virtual Inventory added within the department. This can all be managed from the DEFEND3D web portal; however, the Super Administrator also has the option to install either or VICI Box and VICI Print if they wish to participate in the population and/or printing of Virtual Inventory.

The Super Administrator can also add, remove, and set roles of Contributors within the organisation. Contributors are given access level rights to restrict the use, access or even visibility of files as needed.

3.2. Department Administrator

The department Administrator can create new branches within their department, in the form of Sub-Catalogues. The Department Administrator can then invite an unlimited number of Contributors, with full control over their access level, and assign them to specific or multiple Sub-Catalogues.

The Department Administrator is responsible for monitoring and managing their department and can track user and product activity within their Admin Dashboard. Like the role of Super Administrator, they have administrator rights to control and overwrite any meta-data related to Virtual Inventory, with the ability to edit or remove data when necessary.

3.3. Contributors

Once invited, Contributors receive an email with pre-defined credentials which allow them to access the pre-installed version of either-or VICI Box and VICI Print, based on the access levels permitted.

From there, Projects can be created within the departments giving contributors the ability to create a platform amongst themselves or with their Department
Administrator, where they can then populate secure data to a shared repository, without sharing the file and with full control over their IP.

3.4. Messenger

All roles have access to a Messenger feature within each application, allowing them to communicate with ease whilst using VICI.
User Guide: Super Administrator

4.1. Software Installation

This step is optional for the Super Administrator but is recommended if they wish to participate in the population and printing of Virtual Inventory. Alternatively, they can monitor and manage the organisation from the DEFEND3D web portal.

Installers for both VICI applications can be found within the Subscription page. Once requested, the Super Administrator will receive email confirmation with access to the installers, along with an active License Key to get started.

4.2. Inviting Users

As Super Administrator, invite users to the organisation by setting out roles and responsibilities.

Follow the steps below to Invite a Department Administrator:

1. Access the Admin tab from the DEFEND3D web portal and select ‘Invitations’
2. In the ‘Create an Invitation’ section, select the role ‘Administrator’
3. Enter a valid email address and either enter or generate a password
4. Assign either a VICI Box or VICI Box and VICI Print License from the drop-down
5. Create a new Department and manually enter the Department name
6. Send invitation

Follow the steps below to Invite a Contributor:

1. Access the Admin tab from the DEFEND3D web portal and select ‘Invitations’
2. In the ‘Create an Invitation’ section, select the role ‘Contributor’
3. Select an Access level:
   I. Box and Print Access – Ability to log in to both applications to populate and print
   II. Print (Restricted) Access – Limited access to VICI Print only
   III. Print (Full) Access – Full access to VICI Print only
4. Enter a valid email address and either enter or generate a password
5. Assign a VICI Print License if applicable
6. Select a department from the drop-down list
7. Send invitation

Once invited, the Super Administrator can see the status of users as Active or Inactive and can remove any user at any time with prompts in place to assist with handover of content of users.

4.3. Upgrading Licenses

The Super Administrator can request additional license keys by clicking the ‘Upgrade’ button on their Admin page. Upon request, they will have the option to specify additional licenses required per application. The process for reviewal and confirmation of the upgrade can take up to 48 hours and the Super Administrator will be kept informed via email.
5.1. Invitation

To use VICI, a Department Administrator role must first be created by the Super Administrator. Activation and account details are then sent via email.

5.2. Software Activation

Once invited, the Department Administrator will receive their invitation via email with access to the DEFEND3D Web Portal where they will be prompted for the first time to activate their account via email. If they have not received any accreditation, they should contact their Super Administrator.

5.3. Software Installation

Once the account is activated, the Department Administrator will have access to install either VICI Box, or both VICI Box and Print, based on the invitation set up by the Super Administrator. Upon installing the VICI application, they will be prompted for the first time to enter a License Key, which will be delivered via email.

5.4. Inviting Contributors

The Department Administrator can invite unlimited Contributors to their department and assign access to Sub-Catalogues with specified access rights.

Follow the steps below to Invite a Contributor:

1. Access the Department tab from the DEFEND3D web portal and select ‘Invitations’
2. Enter a valid email address and either enter or generate a password
3. Create a new Catalogue and manually enter the Catalogue name
4. Send invitation

This process can be repeated until all Contributor roles required have been added to the department.

Once invited, the Department Administrator can see the status of Contributors as Active or Inactive and can remove any Contributor at any time with prompts in place to assist with handover of content.
6.1. VICI Box

The VICI BOX application allows permitted users to add digital IP in the format of Gcode. Users are then responsible for ensuring the Gcode file is sliced using correct settings, with the correctly intended printer selected.

Users can then populate the digital catalogue with the relevant meta-data with an option to specify which users will be restricted from viewing and printing specific models from the digital catalogue, before sharing the product to the Department, specific Catalogue(s), and/or a Project.

The VICI Box application is used for populating the digital catalogue with Virtual Inventory, whilst protecting the IP of CAD engineers. The application consists of 2 pages:

**Home**
An embedded version of the DEFEND3D Web Portal, allowing users to monitor and manage their virtual inventory, send, and receive messages, and track the product lifecycle of their Virtual Inventory from printing status to quantity and more.

**Add File**
This is where the core part of the application takes place, where the file is encrypted using the DEFEND3D patented security algorithm. Files at no point leave the machine and remain secure on the device being used.

6.2. Adding Virtual Inventory

VICI Box provides the user with three functionalities to add virtual inventory:

**FDM**
Fused Deposition Modelling
6.3. FDM Functionality

The VICI Box application allows users to add Virtual Inventory in the format of Gcode. Users are responsible for ensuring the Gcode file is sliced using correct settings, with the correctly intended device selected.

Two options are available when adding Virtual Inventory: Single file and Folder. For items containing multiple components, it is recommended users place all files within a single folder before saving. This way they can select the folder directly within VICI Box. Once added, users can review the object in a preview mode with basic functionality to verify the model is correct before submitting.

6.4. Single File Selection

Follow the steps below to add a single Gcode file in VICI Box:

1. Open the VICI Box software application
2. Enter your Login details
3. Click the ADD FILE button
4. Choose the FDM function, and then click on ‘Single Gcode’ and select your Gcode file
5. Select the device the file has been sliced for from the dropdown list and confirm
6. A preview will display on the right side of the screen
7. Click on SUBMIT and wait for the file to finish processing
8. Click on EDIT PRODUCT
9. Add relevant metadata for your product
10. Set the Access Level for the Product
11. Share the product to Department, Catalogue and/or Project
12. Click SAVE

Step 12 will make the product live on the catalogue.
6.5. Folder Selection

Follow the steps below to add a Gcode folder in VICI Box:

1. Open the VICI Box software application
2. Enter your Login details
3. Click the ADD FILE button
4. Choose the FDM function, and then click on ‘Gcode Folder’ and select your file
5. Select the device the file has been sliced for from the dropdown list and confirm
6. A preview will display on the right side of the screen with an option to review each item
7. Click on SUBMIT and wait for the file to finish processing
8. Click on EDIT PRODUCT
9. Add relevant metadata for your product
10. Set the Access Level for the Product
11. Share the product to Department, Catalogue and/or Project
12. Click SAVE

Step 12 will make the product live on the catalogue.

Note: All products in the folder should be prepared for the same machine

6.6. CNC Functionality

In addition to additive manufacturing, the DEFEND3D solution also extends to CNC protocol for subtractive manufacturing.

If your organisation is interested in utilising CNC within the VICI software, please get in touch through the DEFEND3D website to arrange integration of your chosen hardware.

Follow the steps below to add a CNC sliced Gcode file in VICI Box:

1. Open the VICI Box software application
2. Enter your Login details
3. Click the ADD FILE button
4. Choose the CNC function, and then click on ‘Add Gcode’
5. Select the device the file has been sliced for from the dropdown list and confirm
6. A preview will display on the right side of the screen
7. Click on SUBMIT and wait for the file to finish processing
8. Click on EDIT PRODUCT
9. Add relevant metadata for your product
10. Set the Access Level for the Product
11. Share the product to Department, Catalogue and/or Project
12. Click SAVE
6.7. DICOM Functionality

DICOM functionality allows users to convert DICOM data in to an STL format based on selected tissue type selected. The STL file is then available for download, allowing users to slice using external slicing software, before adding the sliced Gcode file back into VICI Box.

6.8. Convert DICOM

Follow the steps below to convert a DICOM in to an STL file:

1. Open the VICI Box software application
2. Enter your Login details
3. Click the ADD FILE button
4. Choose the DICOM function, and then click on ‘Convert DICOM’ and continue
5. Select the type of file you would like to add: ‘Compressed’ or ‘Folder’
6. Select the Tissue Type you would like converted to an STL and click PROCESS
7. Save the file
8. The saved file will then require slicing using external slicing software.

Follow the steps below to add the sliced DICOM file.

1. Open the VICI Box software application
2. Enter your Login details
3. Click the ADD FILE button
4. Choose the DICOM function, and then click on ‘Add DICOM’ and continue
5. Select the device the file has been sliced for from the dropdown list and confirm
6. A preview will display on the right side of the screen
7. Click on SUBMIT and wait for the file to finish processing
8. Click on EDIT PRODUCT
9. Add relevant metadata for your product
10. Set the Access Level for the Product
11. Share the product to Department, Catalogue and/or Project
12. Click SAVE

Step 12 will make the product live on the catalogue.
7.1. VICI Print

VICI Print is the desktop application intended for the end user to access the digital catalogue and One-Click-Print, from a remote location and outside of the trusted environment.

The catalogue is logically arranged and easily managed offering a thumbnail visual display to allow the end user to filter and locate desired products available before adding them to a print queue. Each product page clearly displays the meta-data added by the admin in VICI Box, such as estimated time of print, recommended printing advice and product details. Additional features include the option to contact the designer for support or report a product if faulty.

The application consists of 3 pages, as well as an additional messenger feature for receiving messages or notifications from a VICI Box user.

Account
Upon launching the VICI Print application, you will land on the Account page where you can manage your personal details. You also have the option to connect to a 3D printer in the Device Settings tab on the left, but this can be done from your products page too.

Catalogue
In the catalogue you will find all the products available for your access level. At the top of the screen, you will find a selection of options to filter your search by, such as device, keywords, or categories. For adding the product to your orders click on ‘Add to Queue’.

Products
Once a product has been added from the Catalogue, it will appear in the Products page under your Print Queue. Simply connect to a device and click the Stream button to start printing. You will be prompted to ensure proper calibration before it starts.
Messenger
The messenger feature is a message service that connects designers and users. Once a user reports a product or contacts a designer, a chat thread will be created where the designer and user can communicate directly.

7.2. One-Click Print

Follow the steps below to access and stream via VICI Print:

1. Browse Catalogue
2. Select Model
3. Add to Queue
4. Connect Device
5. Start Streaming
VICI Applications: System Requirements

8.1 VICI Box

- RAM: 8GB minimum, 12GB or more recommended
- DISK SPACE: 4GB minimum, 20GB recommended
- VIDEO CARD: Nvidia, AMD, or Intel, post 2015. 512MB video memory
- CPU: AMD or Intel, post 2015
- NETWORK: Ethernet or wireless connectivity to Local Area Network.
- Operating system: Windows

8.2 VICI Print

- RAM: 4GB minimum, 8GB or more recommended.
- DISK SPACE: 2.5GB minimum.
- VIDEO CARD: Nvidia, AMD, or Intel, post 2015. 512MB video memory.
- CPU: AMD or Intel, post 2015.
- CONNECTIVITY: USB Cable.
- NETWORK: Ethernet or wireless connectivity to Local Area Network.
- Operating system: Windows.

Requires access to a supported printer or CNC machine.