



## FeneVision Hardware & Software Requirements

### Overview

Server requirements (processor/core, memory, disk, network, and Internet bandwidth) will increase based on number of users, transactions, and configuration. It is recommended that these requirements can be easily upgraded to meet the future demand.

### Guiding Principles & Initial FAQs

The following guiding principles and frequently asked questions have been considered:

- We are installing software for a new implementation, what is the best hardware to use?  
*Follow the requirements listed in this document.*
- We are a smaller operation and use physical servers (not virtualized), what should we do?  
*Follow the requirements listed in this document.*
- We have old hardware and have the capability to rebuild our infrastructure, what should we do?  
*Move to a virtualized configuration and follow the requirements listed in this document.*
- We have old hardware and are unable to upgrade our hardware, what should we do?  
*Have a conversation with FeneTech and your IT department to identify the best path forward.*

### Definitions of Servers

- FeneVision Database (SQL) Server – The server where Microsoft SQL Server will run. Databases such as FVMaster, FVOptiGlass, and FVTransLog will be hosted on this server.
- FeneVision WEB Server – The server where the FeneVision WEB website is hosted. Only a requirement for customers using the FeneVision WEB module.
- FeneVision Application Server – The server where FeneVision API will be hosted.
- Remote Desktop Services (RDS) Server – The server where multiple users can log in and use FeneVision applications (CORE, Tracking, Opti-Glass, etc.). Required for Mobile Tracking, Mobile Trucking, and Mobile Inventory.
- FeneVision Test Server – The server where a test version of the production environment will exist. This includes an instance of Microsoft SQL Server.
- FeneVision Dev Server – The server where a test version of the test environment will exist. This includes an instance of Microsoft SQL Server. Configuration changes start here and then can be moved to the FeneVision Test Server for acceptance testing before being moved to the FeneVision Database Server (to go live). This server is optional. It is helpful to have this to make configuration changes easier to manage.

## FeneVision Database Server

Component	Requirements
CPU Speed	Intel Xeon or AMD Epyc - 3.X Turbo GHz or higher
CPU Cores	4+
RAM	128GB+
Storage	Raid 1 Array SSDs – OS and Applications – 250GB+ Raid 10 Array SSDs – Database/Log files – 1TB+ Raid 1 Array SSDs (NVME preferred) – SQL TempDB – 64GB+
Operating System	Microsoft Server 2016+
SQL Server Software	Microsoft SQL Server 2017+ Microsoft SQL Server Reporting Services
Other Software/Features	Microsoft Internet Information Services Microsoft .NET Framework 4.8 Microsoft .NET 6
Networking	Two - 1 GbE Network Interfaces – Teamed

### Notes

Get the highest speed processor you can get. Prioritize clock speed over number of cores. A processor with 4 cores at 3.8 GHz is better for SQL Server performance than a processor with 8 cores at 2.4 GHz. This will provide not only better performance but is cheaper because SQL Server Standard Edition is licensed per CPU core.

If the SQL Server is running in a virtualized environment, the CPU and RAM needs to be dedicated to the SQL Server VM. They cannot be shared with other virtual machines.

FeneVision will require a version of SQL Server that is still under Microsoft mainstream support. You can find the details of version support here: <https://docs.microsoft.com/en-us/sql/sql-server/end-of-support/sql-server-end-of-support-overview?view=sql-server-ver16#lifecycle-dates>. Look for the “Mainstream Support end year” column.

For drives, ensure proper partition offset, block size (64K NTFS) & stripe unit size. In a virtualized environment, the block size of the host would need to match the VM to ensure performance is gained. Follow vendor recommendations for storage configuration.

## FeneVision WEB Server

Component	Requirements
CPU Speed	Intel Xeon or AMD Epyc - 3.X Turbo GHz or higher
CPU Cores	4+
RAM	16GB+
Storage	Raid 1 Array SSDs – OS and Applications – 160GB+
Operating System	Microsoft Server 2016+
Other Software/Features	Microsoft Internet Information Services Microsoft .NET Framework 4.8 Microsoft .NET 6
Networking	Two - 1 GbE Network Interfaces – Teamed

### Notes

For security reasons, the FeneVision WEB Server should be a separate server from the FeneVision Database Server.

The FeneVision WEB Server must also be hosted at the same location as the FeneVision Database Server.

There are a few additional steps an IT professional would need to do to make WEB publicly accessible. These steps are outside what FeneTech can do as we do not manage customer networks or firewalls.

- Configure external access with a public domain for outside access to WEB
  - Ex. <https://www.CustomersDomain.com/wc>
    - This is the customer accessible website
  - (Optional) Ex. <https://www.CustomersDomain.com/wcadmin>
    - For exposing the admin site publicly.
- Configure SSL for WEB
  - The SSL certification should be signed by a trusted CA and installed on the WEB server.
    - Generally this is setup via an HTML redirect

## FeneVision Application Server (Optional)

Component	Requirements
CPU Speed	Intel Core i7 or AMD Ryzen - 3.X Turbo GHz or higher
CPU Cores	4+
RAM	16GB+
Storage	Raid 1 Array SSDs – OS and Applications – 160GB+
Operating System	Microsoft Server 2016+, Microsoft Windows 10+ Pro
Other Software/Features	Microsoft Internet Information Services Microsoft .NET Framework 4.8 Microsoft .NET 6
Networking	Two - 1 GbE Network Interfaces – Teamed

### Notes

The application server can be hosted on the WEB or Database server. It is acceptable to be on a shared server. For peak performance, it should be its own server.

## FeneVision Test Server

Component	Requirements
CPU Speed	Intel Core i7 or AMD Ryzen 3.X Turbo GHz or higher
CPU Cores	4+
RAM	32GB+
Storage	Raid 1 Array SSDs – OS and Applications – 250GB+ Raid 10 Array SSDs – Database files – 500GB+
Operating System	Microsoft Server 2016+, Microsoft Windows 10+ Pro
SQL Server Software	Microsoft SQL Server 2017+ Developer Edition Microsoft SQL Server Reporting Services
Other Software/Features	Microsoft Internet Information Services Microsoft .NET Framework 4.8 Microsoft .NET 6
Networking	1 GbE Network Interface

### Notes

For best results, try to match the FeneVision Test Server as closely as possible to the FeneVision Database Server.

## FeneVision Dev Server (Optional)

Component	Requirements
CPU Speed	Intel Core i7 or AMD Ryzen 3.X Turbo GHz or higher
CPU Cores	4+
RAM	32GB+
Storage	Raid 1 Array SSDs – OS and Applications – 250GB+ Raid 10 Array SSDs – Database files – 500GB+
Operating System	Microsoft Server 2016+, Microsoft Windows 10+ Pro
SQL Server Software	Microsoft SQL Server 2017+ Developer Edition Microsoft SQL Server Reporting Services
Other Software/Features	Microsoft Internet Information Services Microsoft .NET Framework 4.8 Microsoft .NET 6
Networking	1 GbE Network Interface

### Notes

For best results, try to match the FeneVision Dev Server as closely as possible to the FeneVision Database Server.

## Remote Desktop Services Server

Component	Requirements
CPU Speed	Intel Xeon or AMD Epyc - 3.X Turbo GHz or higher
CPU Cores	12+
RAM	64GB+
Storage	Raid 1 Array SSDs – OS and Applications – 250GB+
Operating System	Microsoft Server 2016+
Other Software/Features	Microsoft Internet Information Services Microsoft .NET Framework 4.8 Microsoft .NET 6
Networking	Two - 1 GbE Network Interfaces – Teamed

## EServer Server

Component	Requirements
CPU Speed	Intel Core i5 or AMD Ryzen 2.X Turbo GHz or higher
CPU Cores	2+
RAM	8GB+
Operating System	Microsoft Windows 10+ Pro, <i>Microsoft Windows Server 2012, 2012 R2, 2016, 2019 or 2022 required when using more than one modem</i>
Other Software/Features	Microsoft .NET Framework 4.8 Microsoft .NET 6 Modem(s) <ul style="list-style-type: none"> <li>• Controller based Class 1/2.0 fax modem</li> <li>• US Robotics 5686G (serial), US Robotics 5637 (USB) or equivalent</li> <li>• Dedicated analog phone line</li> <li>• A serial or USB port for each modem</li> </ul>
Networking	1 GbE Network Interface

## Miscellaneous Server Requirements

- Comprehensive backup solution - *See section titled "Backup Solution" below*
- Antivirus software can be installed, but exclusions must be made (<https://support.microsoft.com/en-us/help/309422>)
- SQL Server shall not be installed on the domain controller or RDS server (<https://support.microsoft.com/en-us/help/2032911>)
- Consult your IT Admin/MSP for the most cost-effective licensing option for each type of server. Note: Be aware that CAL licensing will put limitations on the number of WEB users.

## Physical Clients

Primary Application	FeneVision CORE	FeneVision Tracking/Trucking	FeneVision TigerStop HMI <sup>1</sup>	FeneVision GED	FeneVision Opti-Glass	FeneVision Opti-Break/Opti-Temp IN
<b>CPU</b>	Intel Core i5 or AMD Ryzen 3.X Turbo GHz or higher, and at least 4 cores	Intel Core i3 or AMD Ryzen 2.X Turbo GHz or higher		Intel 2.X Ghz	Intel Core i7 or AMD Ryzen 3.X Turbo GHz or higher, and at least 8 cores	
<b>RAM</b>	16 GB	8 GB		1 GB	16 GB	16 GB
<b>Network</b>	1 GbE Network Interface or WiFi	1 GbE Network Interface or WiFi	100MB Network Interface	100MB Network Interface	1 GbE Network Interface or WiFi	1 GbE Network Interface or WiFi
<b>Display</b>	Minimum 1280 x 1024 resolution	Minimum 1280 x 1024 resolution	Minimum 1024 x 768 resolution	Minimum 1024 x 768 resolution	Minimum 1280 x 1024 resolution	Minimum 1280 x 1024 resolution, touchscreen <sup>2</sup> , additional large secondary monitor recommended
<b>Ports</b>	N/A	USB or RS232 port for barcode scanner <sup>3</sup>	RS232 port <sup>4</sup>	RS232 port	N/A	N/A
<b>Operating System (OS)</b>		Microsoft Windows 10+ Pro	Microsoft® Windows® 8.1 Pro, Windows® 10 Pro, Windows® 11 Pro	Microsoft® Windows® 98	Microsoft Windows 10+ Pro	Microsoft Windows 10+ Pro
<b>Additional Software</b>	Microsoft .NET Framework 4.8	Microsoft .NET Framework 4.8 Microsoft .NET 6	-	-	Microsoft .NET Framework 4.8 Microsoft .NET 6	Microsoft .NET Framework 4.8 Microsoft .NET 6

### Additional Requirements

- Comprehensive backup solution - See section titled "Backup Solution" below.
- Client stations must be Active Directory Domain joined to authenticate against the SQL Server and SSRS
- Antivirus software can be installed, but exclusions must be made (<https://support.microsoft.com/en-us/help/309422>)

<sup>1</sup> To use TigerStop HMI, each saw must be unlocked for remote control. Contact your TigerStop representative for more information.

<sup>2</sup> Touch technology that works with gloves is recommended

<sup>3</sup> Trucking requires two RS232 ports and two barcode scanners for dual-dock mode

<sup>4</sup> Appropriate cable for machine interfacing required

## Mobile/Web Clients

Application	FeneVision Mobile Delivery Client	FeneVision Mobile Tracking/Inventory/Trucking	FeneVision WEB Client
Device	Apple iPad or iPhone iOS 12.1 or higher Android tablets and phones V11 or higher	Mobile scanning device running Microsoft Windows CE 5.0 or equivalent Mobile scanning device running Android V4.4.4 or higher	Any modern, up-to-date, mainstream web browser Any operating system
Hardware	16 GB Storage	38-Key functional keypad, 1-D or 2-D Built-in scanner device, 3.2-inch Touchscreen	
Network	WiFi or Cellular Data	WiFi	
Software		Remote Desktop Client App	

## Notes

- FeneVision Mobile Delivery requires a FeneVision WEB Server
  - Cellular data recommended for real-time uploads from Mobile Delivery
- FeneVision Mobile Tracking/Inventory/Trucking requires an RDS Server and appropriate CALs for each client connecting to the server. Consult your IT Admin/MSP for the most cost-effective licensing option.
- Microsoft Edge is required for the Sunroom Designer Module WEB integration

## Physical Hardware

### Label Printers

#### *Model*

Zebra ZT411 or ZPL II Compatible

Note: ZPL compatibility is typically only required for Windows industry

#### *Printer Resolution*

Window Manufacturers – 203 DPI

Glass Fabricators – 300 DPI

### FeneVision Tracking/Trucking Barcode Scanners

USB or Serial scanners can be used with Tracking and Trucking

Trucking requires serial scanners when running in Multi-Dock mode

#### *Scanner Requirements*

USB scanners must support ASCII(2) (STX) preamble and postamble characters

#### *Recommended Models*

Zebra/Symbol Scanners (USB or RS232)

LS2208 – Wired Scanner (requires cable to communicate with computer)

LI3678-SR – Wireless Scanner (requires cradle and cable to communicate with computer)

### Mobile Inventory/Tracking/Trucking Devices

#### *Recommended Models*

Datalogic Skorpion X3

## Additional Requirements

### Backup Solution

FeneTech requires that all customers implement a disaster-recovery backup solution. Backups should occur a minimum of daily, but the customer can backup more often if the desired RTO (Return to Operation) is less than 24 hours. Backups should be “air-gapped,” either with using tapes, or another type of WORM (Write Once, Read Many) storage. Backups will need to be secure from ransomware/virus/network attacks, as well as other physical threats (power disruptions, flooding, fire, wind, etc.)

FeneTech will setup a nightly backup of the databases to the FeneVision SQL Server as part of the SQL maintenance jobs. This backup is NOT intended for disaster recovery. These backups are intended for non-critical items, such as addressing configuration mistakes or for assistance with a support issue. Using the backups from the maintenance jobs as your only backup solution is NOT supported and can leave your FeneVision installation vulnerable.

The backup solution will need to backup all SQL databases on the FeneVision SQL Server, as well as the “FeneTech/FeneVision Shared Directory.” If the customer has virtualized their environment, backup software which can take a backup of the entire virtual machine is advised. This will reduce RTO, as the customer may be able to restore the machine without FeneTech assistance. If the machine is not imaged and/or SQL needs to be reinstalled as part of the restoration, FeneTech will need to provide an emergency server setup, which is not covered by the FeneVision Support and Maintenance Agreement.

### Active Directory

On most modules, FeneVision utilizes Windows Authentication to connect to the SQL server. This requires that the user who is actively logged into the current windows session have credentials that the SQL server recognizes. This is done with the help of Active Directory and is similar to how users authenticate for network file share access.

Customers are encouraged to have two Active Directory servers on network that the SQL server and clients can access for authentication. Two servers help data availability/redundancy. The Active Directory servers must be running a currently supported version of Windows Server, or the customer may run into version compatibility issues when SQL Servers attempts to authenticate user requests.

### Remote Access

FeneTech staff will need access to the FeneVision SQL Server during the implementation stages. This allows FeneTech staff to work with the customer to configure, train, and assist with the FeneVision implementation. FeneTech uses ConnectWise to provide access. ConnectWise is installed and configured as part of the initial server setup.

### Authentication

A “FeneTech Security Group” will need created in Active Directory as part of the initial setup. Users who will need access to use FeneVision, including reports, will need to be part of this Active Directory group.

To use most FeneTech programs, users will also need individual employee accounts created within FeneVision CORE. It is recommended that “Windows Authentication” be selected for these users. This provides single sign-on (SSO) functionality, allowing customers to use the same username and password between FeneVision and their workstation. Using Windows Authentication for employees also allows for enforcement of password security (ex. complexity & expiration), as Windows passwords are managed by rules within Active Directory.

## Frequently Asked Questions

### *When should the minimum requirements be exceeded?*

Minimum requirements were designed for systems with one manufacturing location and an average database size. Exceeding requirements is typically recommended if you will have multiple manufacturing locations, or if you have a database that is larger than average, or if you have many simultaneous users. Exceeding requirements is optional and is often done in preparation for growth, or as an investment in a server that will last longer before it requires replacement.

### *How do I exceed the minimum requirements?*

The most common ways to exceed requirements are to:

- Increase drive space to allow for more backup storage and database growth.
- Increase processor speed or number of cores, processor speed will have the largest impact
  - Note SQL licensing can increase dramatically with an increase in processor cores
- Increase RAM
  - SQL standard edition will consume up to 250GB of RAM - adding OS, SSRS, and other applications, the maximum utilization will be around 300GB. For customers with an FVMaster database that exceeds 128GB in size, aim for 200GB+ of RAM. RAM should exceed the size of that database whenever possible.
- Add more drive arrays to allow simultaneous read/write of data used by SQL server
  - Adding a third drive array to separate data and log files is a typical upgrade that is recommended.
  - The optimal SQL server configuration has 4 separate drive arrays. One for the operating system, one for SQL data files, one for SQL log files, and one for SQL temp database files.

### *I want to build the best server possible, do you have any recommendations?*

There are many factors that come into play so this question is best answered on an individual user basis. It is dependent on environmental factors, quantity of users, quantity of locations, and modules used. Please reach out to FeneTech to schedule a meeting to discuss server specifications with your IT personnel before purchasing any hardware.

### *I am getting SSD drives, and I prefer to partition one drive array into multiple drive letters instead of multiple drive arrays, is that allowed?*

Partitioning one drive into multiple drive letters is acceptable if performance is not impacted. SQL server will read and write to multiple drive arrays at the same time so the connection to the single drive array should not be an I/O bottleneck. FeneTech cannot identify if a problem exists at the time of server setup so this is the responsibility of user's IT personnel.

### *I plan on virtualizing, are there any recommendations for a virtual environment?*

- The server that is hosting the virtual environment must exceed the minimum requirements documented to ensure there are enough resources left to allocate to the virtual server to meet or exceed the minimums.
- Ensure that the server hosting the virtual environment is not performing server maintenance at the same time as the SQL server to eliminate the chance of database corruption.

### *Can I use SAN storage for the SQL server?*

Yes, as long as the necessary performance is maintained. Also ensure there are no conflicts sharing SAN storage with other devices. SQL server is very resource intensive; any bottlenecks or latency can cause significant issues with server performance.

### *Do I need to do RAID 10 or can I use a different RAID configuration?*

RAID 10 is the minimum requirement for the data & log drive. RAID 6 is not recommended as it may decrease disk performance.

RAID 1 is the minimum requirement for the OS drive. It can be upgraded to RAID 5 or RAID 10.