Chapter 4: Installation Requirements

This chapter describes the requirements for hardware, operating system software and system configuration prior to installing Citect SCADA and any of its components.

These requirements will vary subject to the components of Citect SCADA that you attempt to install on any computer. Refer to chapter 3 “Installation Description” to determine the components that you want to install. This chapter identifies the basic hardware and system software requirements, as well as requirements specific to each particular component.

Before you begin to install Citect SCADA, it is recommended that you install the latest updates from Microsoft® for your operating system and system software.

Hardware Requirements

Selecting hardware is dependent upon a number of factors such as:

- the role of the hardware in your SCADA system
- the amount of I/O, alarms, trends and the frequency of change
- number of clients (for servers)
- server clustering
- complexity of your user interface
- degree of customization.

The requirements below have been tested using a simulated SCADA system with 10 clients connected maintaining a server CPU load of less than 25% and should be used as a guideline only taking into account the impact of the factors listed above.

Your SCADA system may require more or less powerful hardware.

Hard Disk Drive (HDD) indicates an estimate of the required amount of space to install the software, store your projects and runtime data.

Computer Performance

General computer performance will be affected by the major elements of CPU, RAM, Bus and HDD speed.
Chapter 4: Installation Requirements

The clock speed no longer defines how powerful a CPU is; the required processor is defined according to an average CPU mark given by PassMark® Software. To check CPU performance, for example for a Core i3 CPU, type “PassMark Core i3” in the search engine of your internet browser. This will give you the CPU’s calculated performance as compared to other similar well-known processors. You can then compare the result against the recommendations below.

**Note:** In general, it is recommended that all computers in your SCADA network utilize no more than approximately 25% CPU in normal state. This allows the system to be responsive, and at the same time have sufficient computing resources available to handle abnormal situations.

### Client Recommendation

<table>
<thead>
<tr>
<th>CPU PassMark®</th>
<th>Cores*</th>
<th>RAM</th>
<th>HDD*</th>
<th>Graphics*</th>
<th>Screen Resolution*</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>2</td>
<td>4 GB</td>
<td>10 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
</tbody>
</table>

1. The complexity of your pages such as number of graphical animations and Ccode running in the background will impact your client CPU choice.
2. If you plan to use this computer as a deployment client, your HDD needs to have the required space for the the number of configured version and space for an additional two versions of your project.
3. DirectX 9 or later with WDDM 1.0 Driver.
4. Citect SCADA supports lower and higher resolutions.

### Server Recommendation

<table>
<thead>
<tr>
<th>I/O per Server*1</th>
<th>CPU PassMark®</th>
<th>Cores</th>
<th>RAM</th>
<th>HDD*</th>
<th>Graphics*</th>
<th>Screen Resolution</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact (&lt;1,500 pts)</td>
<td>1800</td>
<td>1</td>
<td>4 GB</td>
<td>10 GB</td>
<td>64 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
<tr>
<td>Small (&lt;15,000 pts)</td>
<td>4500</td>
<td>4</td>
<td>8 GB</td>
<td>20 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
<tr>
<td>Medium (&lt;50,000 pts)</td>
<td>8000</td>
<td>4</td>
<td>8 GB</td>
<td>100 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
</tbody>
</table>
Chapter 4: Installation Requirements

<table>
<thead>
<tr>
<th>I/O per Server*1</th>
<th>CPU PassMark®</th>
<th>Cores</th>
<th>RAM</th>
<th>HDD*2 *3</th>
<th>Graphics*4</th>
<th>Screen Resolution</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large (&lt;200,000 pts)</td>
<td>10000</td>
<td>8</td>
<td>16 GB</td>
<td>500 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>1 GbE</td>
</tr>
</tbody>
</table>

1. This is a recommendation for a single server only running I/O, alarms, trends and reports. For larger systems, services can be distributed to their own computer and/or clustering can be used to add additional servers. System resources of CPU and Memory should be increased when:
   - using clustering
   - the rate of change of data (I/O or Alarms) is high.
2. If you plan to use this computer as a deployment server, your HDD needs to have the required space for the the number of configured versions and space for an additional two versions of your project.
3. Disk space is an estimate only and includes:
   - Runtime components
   - Compiled project
   - 20% of the I/O trending with a change on average every 10 seconds, 24 x 7 for 3 months.
   - Alarm changes equal to the number of I/O changing per day
4. DirectX 9 or later with WDDM 1.0 Driver.

Engineering Workstation Recommendation

<table>
<thead>
<tr>
<th>Total System Size</th>
<th>CPU PassMark®</th>
<th>Cores</th>
<th>RAM</th>
<th>HDD*1 *2 *3</th>
<th>Graphics*4</th>
<th>Screen Resolution</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact (&lt;1,500 pts)</td>
<td>2000</td>
<td>2</td>
<td>8 GB</td>
<td>10 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
<tr>
<td>Small (&lt;15,000 pts)</td>
<td>2000</td>
<td>2</td>
<td>8 GB</td>
<td>20 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
<tr>
<td>Medium (&lt;50,000 pts)</td>
<td>4250</td>
<td>4</td>
<td>8 GB</td>
<td>50 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
<tr>
<td>Large (&lt;500,000 pts)</td>
<td>4250</td>
<td>4</td>
<td>8 GB</td>
<td>50 GB</td>
<td>128 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
<tr>
<td>Huge</td>
<td>8000</td>
<td>4</td>
<td>8 GB</td>
<td>100 GB</td>
<td>128 MB of</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
</tbody>
</table>
Chapter 4: Installation Requirements

<table>
<thead>
<tr>
<th>Total System Size</th>
<th>CPU PassMark®</th>
<th>Cores</th>
<th>RAM</th>
<th>HDD</th>
<th>Graphics</th>
<th>Screen Resolution</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>(&gt;500,000 pts)</td>
<td>dedicated</td>
<td>VRAM.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. SSD is recommended for Engineering computers for a smoother and faster experience. If a non-SSD is used, select a minimum RPM of 7200.
2. If the Engineering machine is being used as a Deployment Server, the size of the HDD will determine how many versions of your system you can retain.
3. Disk space is an estimate only and includes:
   - Full Citect SCADA installation including optional components and documentation
   - Project Assets for the specified system size
4. DirectX 9 or later with WDDM 1.0 Driver.
5. Citect Studio is designed for a minimum desktop resolution of 1920 x 1080.

HMI Recommendation

<table>
<thead>
<tr>
<th>System Size*1</th>
<th>CPU PassMark®</th>
<th>Cores</th>
<th>RAM</th>
<th>HDD</th>
<th>Graphics*2</th>
<th>Screen Resolution</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact (&lt;1,200 pts)</td>
<td>1400</td>
<td>1</td>
<td>8 GB</td>
<td>10 GB</td>
<td>64 MB of dedicated VRAM</td>
<td>1920 x 1080</td>
<td>100 Mb</td>
</tr>
</tbody>
</table>

1. HMI Client/Server combination.
2. DirectX 9 or later with WDDM 1.0 Driver.

System Software

The following table indicates the system software that is needed on any computer onto which you want to install the Citect SCADA All Core Components installation and all optional components.

<table>
<thead>
<tr>
<th>Citect SCADA Component</th>
<th>Minimum System Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Core Components</td>
<td>Windows 10 or Windows 8</td>
</tr>
<tr>
<td>Operating System</td>
<td></td>
</tr>
</tbody>
</table>
### Chapter 4: Installation Requirements

<table>
<thead>
<tr>
<th>Citect SCADA Component</th>
<th>Minimum System Software</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Windows Server 2012</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2012 R2</td>
</tr>
<tr>
<td></td>
<td>Windows 7 with Service Pack 1 (32 Bit and 64 Bit) or Windows Server 2008 R2 with Service Pack 1 (32 Bit and 64 Bit)</td>
</tr>
<tr>
<td></td>
<td>Microsoft .NET Framework 4.6.1 (installed with Citect SCADA if not already installed)</td>
</tr>
<tr>
<td></td>
<td>Microsoft .NET Framework 2.0 (x64) is required by &quot;Schneider Electric License Manager&quot; and &quot;Schneider Electric Software Update&quot; if using Windows Server 2012</td>
</tr>
<tr>
<td></td>
<td>Internet Explorer Version 9.0 or greater</td>
</tr>
<tr>
<td></td>
<td>A Local Area Network (LAN) if you want to have multiple clients access a remote server</td>
</tr>
<tr>
<td></td>
<td>If running under virtualization with VMWare, the minimum system requirement is VMWorkstation 6.03 and later</td>
</tr>
</tbody>
</table>

### Virtualization Host Support

- The following virtualization environments are supported:
  - Microsoft Hyper-V: based on the version of Windows
  - VMware 5.0: basic virtualization without High Availability and Disaster Recovery
  - VMware Workstation

  For further information on virtualization, please refer to the online Knowledge Base (http://www.citect.schneider-electric.com/scada/vijeo-citect/find-answers/knowledge-base).

  For further information on virtualization, please refer to the online Knowledge Base (http://www.citect.schneider-electric.com/scada/citectscada/find-answers/knowledge-base).

### Citect SCADA WebServer

As for Citect SCADA all Core Components with the addition of:

A LAN running TCP/IP

and

Microsoft Internet Information Services (IIS) See Microsoft IIS Compatibility for information.

### Product Documentation

As for All Core Components.

### Project DBF Add-in for Excel

As for All Core Components, and Microsoft Excel 2007 or later. Microsoft Excel 2013 (32 bit only)
**Chapter 4: Installation Requirements**

**Note:** Use an NTFS file system on the target drive for the Web Server software, otherwise you won’t have effective access to the necessary Windows security settings (that is, the Folder Properties dialog will not have a Security tab). If you are currently using a FAT/FAT32 system, convert the drive to NTFS before installing the Web Server software.

**Microsoft IIS Compatibility**

For correct operation of the WebServer, install the appropriate Microsoft Internet Information Services (IIS) feature for your operating system:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>IIS version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 10</td>
<td>10.0</td>
</tr>
<tr>
<td>Windows 8.1</td>
<td>8.5</td>
</tr>
<tr>
<td>Windows Server 2012 R2</td>
<td>8.5</td>
</tr>
<tr>
<td>Windows 8</td>
<td>8.0</td>
</tr>
<tr>
<td>Windows Server 2012</td>
<td>8.0</td>
</tr>
<tr>
<td>Windows 7</td>
<td>7.5</td>
</tr>
<tr>
<td>Windows Server 2008 R2</td>
<td>7.5</td>
</tr>
<tr>
<td>Windows Server 2008</td>
<td>7.0</td>
</tr>
</tbody>
</table>

**Components recommended for Web Server Installation**

| Web Management Tools       | IIS6 Management Compatibility
|                            | IIS6 Metabase and IIS6 Configuration compatibility
|                            | IIS Management Console
|                            | IIS Management Services
| Application Development Features | ASP
|                               | ISAPI Extensions
| Common HTTP Features         | Default Document
|                               | Directory Browsing
|                               | HTTP Errors
|                               | HTTP REDIRECTION
|                               | Static Content
|                               | WebDAV Publishing
### Components recommended for Web Server Installation

<table>
<thead>
<tr>
<th>Component</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and Diagnostics</td>
<td>HTTP Logging</td>
</tr>
<tr>
<td>Performance Features</td>
<td>Static Content Compression</td>
</tr>
<tr>
<td>Security</td>
<td>Basic Authentication</td>
</tr>
<tr>
<td></td>
<td>Request Filtering</td>
</tr>
<tr>
<td></td>
<td>Windows Authentication</td>
</tr>
</tbody>
</table>

### Runtime Only Server or Client System Software

An installation of a Citect SCADA Runtime Only Server or Client has the same **hardware** and **system software** requirements as the Core.

### Virtualization Host Support

You can run components of your Citect SCADA system in a virtual environment. The following virtualization environments are supported:
- Microsoft Hyper-V: based on the version of Windows
- VMware Workstation: basic virtualization without High Availability and Disaster Recovery
- VMware vSphere

For further information on virtualization, please refer to the online Knowledge Base (http://www.citect.schneider-electric.com/scada/citectscada/find-answers/knowledge-base).

### Anti-virus Software Setup

![WARNING]

**SYSTEM PERFORMANCE DEGRADATION**

The "on access" scan in anti-virus products can lock files used by Citect SCADA, usually having the effect of slowing Citect SCADA down whilst it waits for the scan of that file to finish.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**
Chapter 4: Installation Requirements

CAUTION

INOPERABLE SYSTEM OR LOSS OF DATA

In some extreme cases, anti-virus software may (incorrectly) detect certain patterns within data files as being viruses. Depending on the anti-virus configuration, this may result in files being relocated or deleted, resulting in data being lost or the system being inoperable.

Failure to follow these instructions can result in injury or equipment damage.

It is recommended that the following directories are excluded from scanning by any anti-virus products:
- Program Files installation directory (including files and sub directories)
- Data and Logs directories
- Any alarm server archive paths

The above exclusions are recommended for "on access" or "real time" scans that run continuously and scan each file that is read from or written to.

Software Protection

Citect SCADA supports two different software licensing models:
- Sentinel Licensing (using USB keys)
  Sentinel Licensing is a legacy licensing solution for Citect SCADA. It uses physical USB keys that plug in to each computer in your Citect SCADA system. The USB key contains details of your user license, such as its type and I/O point count.
  When you upgrade to a new version of Citect SCADA, you are required to update your Sentinel keys. To do this, you need to retrieve an authorization code from Schneider Electric (Australia) Pty. Ltd.’s online License Generator (see Updating Your Hardware Key).
- FLEXERA Softkey Licensing
  The FLEXERA softkey solution stores license information on a FlexNet Enterprise License Server. The Citect SCADA client process will retrieve licenses from this server as required by the Citect SCADA system. To activate and administer licenses, you use the Floating License Manager (see Floating Point License Manager).

In both cases, Citect SCADA uses a Dynamic Point Count Licensing to determine if your system is operating within the limitations of your license agreement. This process tallies the number of I/O device addresses being used by the runtime system.

A point limit is allocated to each type of license included in your license agreement. These license types include:
Chapter 4: Installation Requirements

- Full Server Licenses
- Control Client Licenses
- View-only Licenses.

A special OPC Server License is also available if you want to run a computer as a dedicated OPC server. For more information, contact Technical Support.

**Note:**
- There is no distinction between a Control Client and an Internet Control Client.
- There is no distinction between a View-Only Client and an Internet View-Only Client.

**See Also**
- Demo Mode

**Updating Your Hardware Key**

When you upgrade to a new version of Citect SCADA, you need to update any existing Sentinel USB hardware keys to enable the system to run.

**To update a Sentinel USB key with CIUSAFL**:  
1. Plug the key you would like to update in a local USB port.  
2. Open Citect Studio.  
3. On the Activity Bar, select Licensing from the menu.  

   OR

   Click the Licensing icon.

4. On the Sentinel Key Update panel, click Launch.

   The CIUSAFL dialog box will appear.

5. Retrieve the Serial Number for the key from CIUSAFL.

6. Visit [www.citect.schneider-electric.com/license-generator](http://www.citect.schneider-electric.com/license-generator), and enter the serial number in the USB Key Serial Number field.

7. Click Submit.

   If the key is validated, an authorization code will be generated.

8. In CIUSAFL, enter the generated code in the Authorization Code field.

9. Click Update.

   CIUSAFL will display a Return Code to confirm if the update was successful. See the table below for an explanation of the return code values.
Chapter 4: Installation Requirements

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The key was updated successfully.</td>
</tr>
<tr>
<td>1,3</td>
<td>Either the KeyID or the Authorization code you entered is invalid.</td>
</tr>
<tr>
<td>2</td>
<td>Either the KeyID or the Authorization code you entered has been corrupted.</td>
</tr>
<tr>
<td>4,16</td>
<td>Either the KeyID or the Authorization code you entered is invalid.</td>
</tr>
<tr>
<td>9</td>
<td>No hardware key could be found.</td>
</tr>
</tbody>
</table>

**Note**: Each time you run the Sentinel Key Update, a different Key ID is generated which is normal. However, if you obtain an authorization code but do not immediately update the hardware key, you can enter the same authorization code the next time you run the update.

Floating Point License Manager

If your Citect SCADA system uses FLEXERA Softkey Licensing, you need to activate your licenses to allocate the computers in your system. To do this, you use the Schneider Electric (Australia) Pty. Ltd. Floating License Manager.

**Note**: If you have purchased softkey licenses for your Citect SCADA system, the required activation codes will be emailed to you from scada.orders@schneider-electric.com.

**To activate a license using Floating License Manager:**

1. Obtain the required license activation code from the purchase confirmation email.
2. Open Citect Studio.
3. On the Activity Bar, select **Licensing** from the menu.

   OR

   Click the **Licensing** icon.

4. On the **License Manager** panel, click **Launch**.

   The Schneider Electric (Australia) Pty. Ltd. Floating License Manager will appear. It will include a list of the floating licenses that are already available on the FlexNet Enterprise License Server.

5. Click **Activate**.
6. On the dialog that appears, select an **Activation Method**, then click **Next**.
7. Enter the **Activation ID** that was emailed to you, then click **Next**.
The following steps will be determined by activation method you selected. If you require assistance, click the Help button for instructions.

8. To finalize the activation process, you will be prompted to restart the FlexNet License Administrator. Click Yes.

The license you have activated will now appear in the list displayed in the Floating License Manager.

There are several other tasks you can perform with Floating License Manager. For more information on its supported functionality, see the documentation that is available from the Help menu.

See Also

Dynamic Point Count Licensing

Dynamic Point Count Licensing

Citect SCADA counts I/O device addresses dynamically at runtime.

The client process keeps track of the dynamic point count. This includes variable tags used by the following:

- Alarms
- Trends
- Reports
- Events
- OPC DA Server
- EWS Server
- Pages and Super Genies
- Cicode functions (TagRead, TagWrite, TagSubscribe, TagGetProperty and TagResolve)
- Any tag referenced by Cicode
- Reads or writes using DDE, ODBC, CTAPI or external OPC DA clients.

A particular variable tag is only counted towards your point count the first time it is requested. Even if you have configured a certain tag on a particular page in your project, the variable tag will not be counted towards your point count unless you navigate to that page and request the data.

You should also be aware of the following:

- A dynamic point count is tag based, not address based. For example, two tags that use the same PLC address will be counted twice.
- For the multi-process mode, each server component will accumulate its own point count which will add to the total of the client dynamic point count.
If two trend tags use the same variable tag, it will be counted once. If two server components use the same tag(s) (say alarm and trend), the tags will not be counted twice when the point count gets totaled in the client process.

- For the multi-process mode, the client component will also accumulate its own point count, which will include all the variable tags that are used by the process.
- For the multi-process mode, the machine point count will be the point count of the client component, or the point count added up from each server component, depending on whichever is bigger. If the server point count is greater than 500, the client component point count is disregarded.
- Reading properties of a tag with TagGetProperty() or TagSubscribe() will cause that tag to be included in the point count, even if the value is not read.
- Persisted I/O (memory devices), local variables and disk I/O variable tags will not count towards the dynamic point count, unless they are written to by an external source (via OPC, DDE, ODBC, or CTAPI). For example, if you use an OPC client to write to a local variable, each local variable will be counted once the first time it is used.

**Note:** You can use the CitectInfo() Cicode function or the General page in the Citect SCADA Kernel to determine the point count status of a client process. See the [Licensing Statistics](#) for the Page General Kernel command.

**See Also**

Demo Mode

**Demo Mode**

You can run Citect SCADA without the hardware key in demonstration (demo) mode. Demo mode lets you use every Citect SCADA feature normally, but with runtime and I/O restrictions.

In demo mode, you can run multiple processes (with the networking model selected as "stand alone"), or in single process mode.

The following demonstration modes are available:

- 15 minutes with a maximum of 50,000 real I/O.
- 10 hours with a maximum of one dynamic real I/O. This is useful for demonstrations using memory and disk I/Os. Citect SCADA starts in this mode if no hardware key is available. If the system detects that you are using more than one real I/O point at runtime, then it will swap to the 15 minutes demo mode.
**Note:** Writing to any tag through DDE, CTAPl, or ODBC will cause that tag to contribute to the dynamic point count even if it is a memory or disk I/O point. So if you write to more than one point through these interfaces, it will swap to the 15 minute demo mode.