



Requirements – PSCAD v4.6.3 Updates 4 and 5

1. HARDWARE

| Category | Recommendations |
|-------------------------|--|
| Computer ^[1] | Good motherboard with fast front-side speed 8 GB + of fast high quality RAM ^[2] Solid state hard drive 64 bit operating system 4 + CPU cores ^[3] with a decent CPU ranking One USB 2.0 port or better if “Legacy Lock-based Licensing” is used (see Section 4.2) Internet connection |

2. USAGE

| Category | Requirements |
|-----------------------|--|
| Operating System | Microsoft® Windows 7 SP1 and Windows 10 ^[4] (officially supported) <ul style="list-style-type: none">64-bit Windows is recommended.It may be possible to run on a virtual machine.The following additional operating systems may also work: Microsoft® Windows 8 and 8.1, and Windows Server 2008 R2 SP1, 2012 R2, 2016 and 2019PSCAD version 4.6 and higher is not supported on: Microsoft® Windows XP, Windows Vista, and Windows 7 SP0 |
| Prerequisite Software | Microsoft® Visual C++ 2015 Redistributables, x86 and x64 ^[5] Microsoft® .NET Framework 4.6.1 Full, minimum ^[6] |
| Launching and Running | Microsoft® Windows User privileges |
| User Profile | Mandatory user profiles are not supported |
| Licensing | See Section 4 |
| Third Party Software | A compatible FORTRAN compiler is required. For details, refer to Selecting your FORTRAN compiler . |
| Execution Permissions | The application executable files must be whitelisted in all protection software: <ul style="list-style-type: none">For PSCAD:<ul style="list-style-type: none">The path may be set generally, as: %PROGRAMFILES%\PSCAD<version>Or, the path may be specified as: For the 32-bit edition: C:\Program Files (x86)\<version>\bin\win\pscad.exe For the 64-bit edition: C:\Program Files (x86)\<version>\bin\win64\pscad.exe For both editions: C:\Program Files (x86)\<version>\bin\win\tline.exe C:\Program Files (x86)\<version>\utilities |



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| Execution Permissions (continued) | <ul style="list-style-type: none"> For the Intel® Parallel Studio Composer Edition for FORTRAN: %PROGRAMFILES%\Intel For Microsoft® Visual Studio: %PROGRAMFILES%\Microsoft Visual Studio <version> <p>Allow the user execute permissions to the following within %SYSTEM32%:</p> <ul style="list-style-type: none"> cmd.exe conhost.exe <p>The executable files created by the application must be permitted in all protection software. See listing in Appendix F of Resolving Issues.</p> |
| Folder Permissions | <p>The user must have full permissions for the following folder and sub-folders:</p> <ul style="list-style-type: none"> Common Documents folder (e.g. C:\Users\Public\Documents) <p>The following sub-folders will be created, and the user must have full permissions:</p> <ul style="list-style-type: none"> C:\Users\<your username>\AppData\Local\Manitoba HVDC Research Centre C:\ProgramData\Manitoba HVDC Research Centre |
| Communication Over TCP/IP | This is required for PSCAD and the executables listed above for the purpose of simulation control and data collection for plots. |
| Network Ports | Ports 30,000 to 40,000 must be available to allow PSCAD and EMTDC communication |

3.1 INSTALLATION – General

| Category | Requirements |
|---------------------------|---|
| Registry Keys Permissions | <p>32-bit registry keys (used by PSCAD (32-bit) and PSCAD (64-bit)):</p> <ul style="list-style-type: none"> HKCU\Software\Manitoba HVDC Research Centre\Pscad HKCU\Software\Manitoba HVDC Research Centre Inc\Pscad HKLM\Software\Manitoba HVDC Research Centre\Pscad HKLM\Software\Manitoba HVDC Research Centre Inc\Pscad <p>64-bit registry keys (used by PSCAD (64-bit) only):</p> <ul style="list-style-type: none"> HKCU\Software\Manitoba HVDC Research Centre\Pscad HKCU\Software\Manitoba HVDC Research Centre Inc\Pscad HKLM\Software\Manitoba HVDC Research Centre\Pscad HKLM\Software\Manitoba HVDC Research Centre Inc\Pscad |

3.2 INSTALLATION – InstallShield Wizard Installer

| Category | Requirements |
|--|---|
| General Requirements | As listed in Section 3.1 |
| Downloading | Internet connection |
| Installing (and removing) the Software (PSCAD, License Manager, GFortran, Prerequisites, Sentinel Drivers) | Microsoft® Windows Administrator privileges |

3.3 INSTALLATION – Installer Utility

| Category | Requirements |
|----------------------|--|
| General Requirements | As listed in Section 3.1 |
| Downloading | Internet connection |
| Running | Microsoft® Windows Administrator privileges |
| Logging | The following sub-folders will be created, and the user must have full permissions: C:\Users\ <your username> \AppData\Local\Manitoba HVDC Research Centre\Installer |

3.4 INSTALLATION – MyUpdater

| Category | Requirements |
|--|--|
| General Requirements | As listed in Section 3.1 |
| Access to Product Downloads | Add the first or both of the following URLs to all anti-virus/firewall whitelists: https://products.pscad.com ftp://ftps.pscad.com |
| Installing | Microsoft® Windows Administrator privileges Internet connection |
| Launching (to Install or Update Software) | Microsoft® Windows Administrator privileges Internet connection |
| Launching (to Uninstall Software) | Microsoft® Windows Administrator privileges |
| Launching (to Launch Installed Software) | Microsoft® Windows User privileges (unless otherwise specified) |
| Connection to Publication Server | Add the first or both of the following URLs to all anti-virus/firewall whitelists: http://publisher.pscad.com:80/ net.tcp://publisher.pscad.com:443/ |
| Supported Protocols | TLS 1.0, TLS 1.1, TLS 1.2 |

4.1 LICENSING – Certificate Licensing

| Category | Requirements |
|--|--|
| Certificate | MyCentre user account with access to a licensed WorkGroup |
| Operational Requirements | Supported on a local desktop, or remote desktop, or over virtual private network (VPN). Not guaranteed in a cloud desktop environment, but could be verified using diagnostic tools. |
| Connection to the License Server | Add both of the following URLs to all anti-virus/firewall whitelists: <ul style="list-style-type: none"> http://licensing.pscad.com:80/Licensing net.tcp://licensing.pscad.com:443/Licensing |
| Activate/Release/Refresh a Certificate | Microsoft® Windows User Privileges Internet connection |
| Using Certificates | The following sub-folders will be created for certificates for PSCAD v4.5.1...v4.6.3: <ul style="list-style-type: none"> Path: C:\Users\Public\Documents\Manitoba HVDC Research Centre\Licensing\Licenses Required permissions: FullControl for Everyone |



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| | <p>The following sub-folder should already exist and will be used:</p> <ul style="list-style-type: none"> • Path: C:\ProgramData\Microsoft\Crypto\RSA\MachineKeys • Required permissions: Read, Write for Everyone |
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|---------------------|---------------------------|
| Supported Protocols | TLS 1.0, TLS 1.1, TLS 1.2 |
|---------------------|---------------------------|

4.2 LICENSING – Legacy Lock-based Licensing - General

| Category | Requirements |
|--|---|
| Licensing Media | <p>The License Database File must be installed on the licensed machine</p> <p>The Sentinel USB Lock must be installed on the licensed machine</p> |
| To Communicate with the Sentinel Lock | <p>Sentinel Driver software^[7] to use the Sentinel USB lock</p> <p>For Microsoft® Windows 10 (all releases), Sentinel System Driver 7.6.0 or better is required.</p> <p>For Microsoft® Windows 10 Build 1803 or better, the following is required: Sx32w.dll, version 7.1.0.14</p> <p>One USB 2.0 port or better</p> |
| To Install a License Database File | Microsoft® Windows Administrator Privileges |
| To Use the License Update Tool | <p>Microsoft® Windows Administrator Privileges</p> <p>Internet connection is required if downloading the posted (current) version</p> |
| To Activate a License | Microsoft® Windows User Privileges |
| Access to Obtain and Retain Licensing Settings | <ul style="list-style-type: none"> • Settings accessible to everyone on the specified machine: HKEY_LOCAL_MACHINE\SOFTWARE\Manitoba HVDC Research Centre Inc\PSCAD\License <p>Note</p> <p>Microsoft® Windows Administrator Privileges are required to modify them.</p> <ul style="list-style-type: none"> • Settings applicable only to specified individuals on a machine: HKEY_CURRENT_USER\Software\Manitoba HVDC Research Centre Inc\PSCAD\License <p>Note</p> <p>Only Microsoft® Windows User-level Privileges are required to read or modify them, unless prohibited by a group policy.</p> |

4.3 LICENSING – Legacy Lock-based Licensing –Local Licensing

| Category | Requirements |
|----------------------|--|
| General Requirements | As listed in Section 4.2 |
| Machine | <p>Supported on a local machine, but may be possible to use virtual private network (VPN) to remote log in.</p> <p>Not supported in a cloud desktop environment.</p> |
| Firewall | Ports 2053 and 2054 must be open |

4.4 LICENSING – Legacy Lock-based Licensing – Network Licensing

| Category | Requirements |
|----------------------|--------------------------|
| General Requirements | As listed in Section 4.2 |



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| Machine – Client | Supported on a local machine, but may be possible to use virtual private network (VPN) to connect to the server. Not supported in a cloud desktop environment (generally they are not connected to the corporate network). Internet connection is required if using VPN for a remote License Manager. |
| Machine – Server | Supported on a physical machine, but may be possible to use a virtual server. Contact the PSCAD Support Desk support@mhi.ca for details. |
| License Manager Software | Must be installed as applicable: <ul style="list-style-type: none"> On the server, if the license is hosted on the server and shared over the network with client machines On the client machine, if the license is used locally on the client machine and has more than one seat |
| ICMP Ping Echo and ICMP Ping Reply | Must be enabled on the firewall for the host and client machines |
| TCP/IP and UDP/IP on Ports 2053 / 2054 | Must be open on the firewall |
| NetBIOS (if used) Port 137 | Must be allowed on the server |
| Start / Stop / Restart the License Manager Service | Microsoft® Windows Administrator Privileges |
| Using the License Manager Setup Tool | Microsoft® Windows Administrator Privileges Internet connection is required if downloading the posted (current) version |

5. THE LICENSE MANAGER (v1.45)

| Category | Requirements |
|--|---|
| Operating System | Microsoft® Windows 7 SP1 and Windows 10 (32-bit and 64-bit) (officially supported) The following operating systems may also work: <ul style="list-style-type: none"> Microsoft® Windows 8 and Windows 8.1 Microsoft® Windows Server 2008 R2 SP1, Windows Server 2012 R2, 2016 and 2019 The License Manager is not supported on the following: Microsoft® Windows XP, Windows Vista, Windows 7 SPO Supported on a physical machine, but may be possible to use a virtual server. The USB lock must be connected. Contact the PSCAD Support Desk support@mhi.ca for details. |
| Prerequisite Software | Microsoft® Visual C++ 2017 Redistributables, x86 Microsoft® .NET Framework 4.0 Full, minimum |
| Installation | Microsoft® Windows Administrator Privileges |
| Start/Stop/Restart the License Manager | Microsoft® Windows Administrator Privileges |
| License Manager Setup Tool | Microsoft® Windows Administrator Privileges Internet connection is required if downloading the posted (current) version |
| Running/Restarting the License Manager | Whitelist the License Manager executable files in this folder: <i>C:\Program Files (x86)\HVDC Lmgr\WinNT</i> |
| TCP/IP and UDP/IP on Ports 2053 / 2054 | Must be open on the firewall |



6. DIAGNOSTIC TOOLS

| Category | Requirements |
|--------------------------------|---|
| Running the Get Info tool | Microsoft® Windows User Privileges Internet connection is required if downloading the posted (current) version |
| Running the FORTRAN Medic Tool | Microsoft® Windows User Privileges Internet connection is required if downloading the posted (current) version |
| Viewing Log Files | Microsoft® Windows User Privileges |

Notes

1. PSCAD is a numerically intensive power system transients simulator; a fast and efficient personal computer is recommended for best results. To obtain specifications for extremely high workloads, please contact the PSCAD Support Desk for information (support@mhi.ca).
2. Personal computers configured with slower processors and lesser RAM may be used, but slower execution performance will result. In other words, simulation speed increases with processor speed and amount of installed RAM.
3. Generally, the faster the better. We recommend at least a four-core processor to take advantage of Parallel and High Performance Computing (refer [here](#) and [here](#)). Additional licensed capabilities may be purchased to maximize these features. For more information, refer to the [Requirements](#) manuals or contact the Support Desk (support@mhi.ca).
4. The PSCAD product is sold as a 32-bit and 64-bit application. On a 64-bit machine, both applications are installed. On a 32-bit machine, only the 32-bit application is installed.
5. The 32-bit edition of Visual C++ Redistributables is required on Microsoft® Windows 32. Both the 32-bit and 64-bit editions of Visual C++ Redistributables are required on Microsoft® Windows 64. If this prerequisite software is not already installed, the user will be prompted to install it when PSCAD is installed.
6. If this prerequisite software is not already installed, the user will be prompted to install it when PSCAD is installed.
7. Sentinel System Driver 7.6.0 is installed automatically alongside PSCAD v4.6.3 Update 4 and License Manager v1.45.



DOCUMENT TRACKING

| Rev. | Description | Date |
|------|--|-------------|
| 0 | Initial | 22/Jul/2020 |
| 1 | Updated versions of Windows servers in Chart 2 | 22/Oct/2020 |
| 2 | Update to folder permissions in Chart 4.1 | 27/Oct/2020 |
| 3 | Update to Chart 5 | 21/Dec/2020 |