Requirements – PSCAD v5.0.0

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
	8 CPU cores (minimum 4)[3] with a decent CPU ranking
	One USB 2.0 port or better if "Legacy Lock-based Licensing" is used (Section 4.2)
	Internet connection

2. USAGE

Category	Requirements
Operating System	Microsoft® Windows 7 SP1 64-bit and Windows 10 64-bit[4] (officially supported)
	• 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 2019
	• Not supported on: Microsoft®Windows XP, Windows Vista, and Windows 7 SP0
Prerequisite Software	Microsoft® Visual C++ 2017 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:
	• For PSCAD:
	o The path may be set generally, as: %PROGRAMFILES%\PSCAD**<version>**
	o Or, the path may be specified as: C:\Program Files (x86)**<version>**\bin\win64\pscad.exe C:\Program Files (x86)**<version>**\bin\win\tline.exe C:\Program Files (x86)**<version>**\utilities
	• For the Intel® Parallel Studio Composer Edition for FORTRAN: %PROGRAMFILES%\Intel
	• For Microsoft® Visual Studio: %PROGRAMFILES%\Microsoft Visual Studio **<version>**

	Allow the user execute permissions to the following within %SYSTEM32%:
	• cmd.exe
	• conhost.exe
	The executable files created by the application must be permitted in all protection software. See listing in Appendix F of [Resolving Issues]().
Folder Permissions	The user must have full permissions for the following folder and sub-folders:
	• Common Documents folder (e.g. C:\Users\Public\Documents)
	The following sub-folders will be created, and the user must have full permissions:
	• 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 in *Execution Permissions* 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	32-bit registry keys (used by PSCAD (64-bit)):
	• 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
	64-bit registry keys (used by PSCAD (64-bit)):
	• 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
	• The user must have full permissions for the following path:
	C:\Users\Public\Documents\

Logging	The following sub-folder 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: • 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: • Path: C:\Users\Public\Documents\Manitoba HVDC Research Centre\Licensing\Licenses • Required permissions: FullControl for Everyone The following sub-folders will be created for certificates for PSCAD v5 and newer: • Path: C:\Users**<user_id>**\AppData\Local\Manitoba Hydro International\Licensing\Licenses • Required permissions: FullControl for **<user_id>** The following sub-folder should already exist and will be used: • Path: C:\ProgramData\Microsoft\Crypto\RSA\MachineKeys • Required permissions: Read, Write for Everyone

Supported Protocols	TLS 1.0, TLS 1.1, TLS 1.2

4.2 LICENSING – Legacy Lock-based Licensing - General

Category	Requirements
Licensing Media	The License Database File must be installed on the licensed machine
	The Sentinel USB Lock must be installed on the licensed machine
To Communicate with the Sentinel Lock	Sentinel Driver software to use the Sentinel USB lock[7]
	For Microsoft® Windows 10 (all releases):
	• Sentinel System Driver 7.6.0 or better is required[8]
	• For Microsoft® Windows 10 Build 1803 or better, Sx32w.dll, version 7.1.0.14 is required
	One USB 2.0 port or better
To Install a License Database File	Microsoft® Windows Administrator privileges
To Use the License Update Tool	Microsoft® Windows Administrator privileges
	Internet connection is required if downloading the posted (current) version
To Activate a License	Microsoft® Windows User privileges
Access to Obtain and Retain Licensing Settings	• Settings accessible to everyone on the specified machine:
	HKEY_LOCAL_MACHINE\SOFTWARE\Manitoba HVDC Research Centre Inc\PSCAD\License
	Note
	Microsoft® Windows Administrator privileges are required to modify them.
	• Settings applicable only to specified individuals on a machine:
	HKEY_CURRENT_USER\Software\Manitoba HVDC Research Centre Inc\PSCAD\License
	Note
	Only Microsoft® Windows User-level privileges are required to read or modify them, unless prohibited by a group policy.

4.3 LICENSING – Legacy Lock-based Licensing – Local Licensing

Category	Requirements
General Requirements	As listed in Section 4.2
Machine	Supported on a local machine, but may be possible to use virtual private network (VPN) to remote log in.
	Not supported in a cloud desktop environment.
Firewall	Ports 2053 and 2054 must be open
Standalone License Manager (see Section 5 below)	Must be installed if the PSCAD license contains more than one PSCAD seat

4.4 LICENSING – Legacy Lock-based Licensing – Network Licensing

Category	Requirements
General Requirements	As listed in Section 4.2
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 (see Section 5 below)	Must be installed on the server to manage license sharing
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

5. THE LICENSE MANAGER[9]

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: • Microsoft® Windows 8 and Windows 8.1 • Microsoft® Windows Server 2008 R2 SP1, Windows Server 2012 R2, R2016, and 2019 The License Manager is not supported on the following: Microsoft® Windows XP, Windows Vista, Windows 7 SP0 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.
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: *C:\Program Files (x86)\HVDC Lmgr\WinNT*
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 Support Desk.

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 an eight-core processor (or at least a four-core processor) to take advantage of Parallel and High Performance Computing (refer here). Additional licensed capabilities may be purchased to maximize these features. For more information, refer to the requirements manuals or contact the Support Desk.

4. PSCAD v5.0.0 is not supported on a 32-bit operating system.

5. Both the 32-bit and 64-bit editions of Visual C++ Redistributables are required on your Windows 64-bit Operating System. If this prerequisite software is not already installed, the user will be prompted to install it when PSCAD is installed.

6. If Microsoft® .NET Framework 4.6.1 Full or better is not already installed, the user will be prompted to install it when PSCAD is installed.

7. Sentinel Driver software is installed automatically alongside PSCAD and the License Manager.

8. Sentinel Driver version 7.6.0 is deployed with PSCAD 5.0.0 and License Manager v1.45.

9. The License Manger is required to manage either a "local license" containing multiple seats or a "network licensing" (see Sections 4.3 and 4.4).

DOCUMENT TRACKING

Rev.	Description	Date
0	Initial	05/Mar/2019
1	Numerous updates throughout	22/Sep/2020
2	Updated versions of Windows servers in Chart 2	22/Oct/2020
3	Update to folder permissions in Chart 4.1	27/Oct/2020
4	Update to Chart 5	21/Dec/2020
5	Fixed link to Resolving Issues document in Chart 2	04/Mar/2022