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ANSYS Motor-CAD Installation Instructions

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1. Software Installation

Before installing Motor-CAD an ANSYS licence server should be installed.

To install Motor-CAD the user must have Administrator rights for Windows. After Motor-CAD is run for the first time normal user rights become sufficient. Motor-CAD is installed on a computer by running **ANSYS_Motor-CAD_Setup_vxxxx.exe.**

If you get a warning click on **[Yes]** as shown below:

User Account Control	×
Do you want to allow t unknown publisher to device?	his app from an make changes to your
ANSYS_Motor-CAD_Setu	p_15_0_5.exe
Publisher: Unknown File origin: Hard drive on this cor	mputer
Show more details	
Yes	No

The installation sequence and screenshots are shown below:



The installation may take about 5 minutes to prepare the installation wizard.



Click the **[Next]** button to proceed with the installation.

🇱 ANSYS Motor-CAD_15_0_5 - InstallAware Wizard	—		\times
ANSYS [®] Motor-CA	١D		
Welcome to the InstallAware Wizard fo ANSYS Motor-CAD_15_0_5	or		
The InstallAware Wizard will install ANSYS Motor-CAE on your computer.	0_15_0_5		
WARNING: This program is protected by copyright la international treaties.	w and		
To continue, click Next.			
< Back N	lext >	Can	cel



Please read the license agreement and then confirm your acceptance of the licence agreement terms by selecting the checkbox and click the **[Next]** button to proceed.

THE	ANSYS Motor-CAD_15_0_5 - InstallAware Wizard —	×
	ANSYS Motor-CAD	
	License Agreement Please carefully read the following license agreement.	
	CLICKWRAP SOFTWARE LICENSE AGREEMENT	^
	Version August 14, 2020	
	***IF LICENSEE HAS PREVIOUSLY AGREED IN WRITING TO A SOFTWARE	
	LICENSE AGREEMENT WITH LICENSOR THAT SPECIFICALLY GOVERNS USE OF	
	THE PROGRAM(S), SUCH SOFTWARE LICENSE AGREEMENT SUPERSEDES	
	AND REPLACES THIS CLICKWRAP SOFTWARE LICENSE AGREEMENT, AND	
	THIS CLICKWRAP SOFTWARE LICENSE AGREEMENT IS VOID.***	
		¥
	I accept the terms of the license agreement	
	< Back Next > Cancel	



Enter the port and server where your ANSYS licence server is installed.

This should be provided by the person who has installed your licence server. The syntax of this is port@myServername.

ANSYS Motor-C	AD_15_0_5 - InstallAware Wizard - 🗆 🗙					
ΛN <mark>S</mark>	Motor-CAD					
Licence Type Choose the lice	nce type you are using:					
Ansys	The licence will be obtained from an ANSYS Licence server on your network. (Environment variable: ANSYLMD_LICENSE_FILE)					
	ANSYS Licence Server : 1055@myservername e.g. 1055@myservername					
○ <u>F</u> lexLM	FlexLM The licence will be obtained from a FlexLM licence server on your network or local computer. (Environment variable: MOTORDES_LICENSE_EILE)					
	FlexLM Licence Server : 1100@localhost e.g. 1100@myservername or 1100@localhost					
O Do not se	tup / Specify Later					
an na saaree ee saar	< Back Next > Cancel					

Click the **[Next]** button to proceed.

Please note that if there is a previous installation of ANSYS Motor-CAD, the previously set licensing settings will not be overridden, but they can be changed later. See appendix B after installation in order to reconfigure the licence settings.



Then select the folder where the Motor-CAD program and documentation are to be installed. It is recommended to use the default folder locations given to ensure Motor-CAD has sufficient access rights to be able to write out results files.

Click the **[Next]** button to proceed.

ANSYS Motor-CAD_15_0_5 - InstallAware V	Vizard	_		\times		
ANSYS [®] Mo	tor-CA	D				
Destination Folder Select folder where setup will install files.						
Install ANSYS Motor-CAD_15_0_5 to: c:\ANSYS_Motor-CAD\15_0_5		Chang	je			
Destination Folder Required Disk Space: Remaining Disk Space:		976,2 231,39	19 KB 19 MB			
InstallAware	< Back Nex	t >	Canc	el		



Click the **[Next]** button to proceed.

ANSYS Motor-CAD_15_0_5 - InstallAware Wizard	—		\times
ANSYS Motor-CA	D		
Select Program Folder			
Select the location where you would like to create new shortcuts.			
Setup will add program shortcuts to the Program Folder listed below a new folder name, or accept the suggested name. Click Next to co	. You may ntinue.	/ type	
Program Folder:			
ANSYS Motor-CAD			
Install this application for: Anyone who uses this computer (all users) Only for me (current user) 			
InstallAware			
< Back Nex	t >	Canc	el

The installation may take several minutes to complete.

🇱 ANSYS Mot	or-CAD_15_0_5 - InstallAware Wizard —			\times			
ΛN	SYS [®] Motor-CAD						
Installing ANSYS Motor-CAD_15_0_5 The program features you selected are being configured.							
17	Please wait while the InstallAware Wizard installs ANSYS Motor-CAD_15_0_5. This may take several minutes.						
	Status: Folder: Creating folders						
InstallAware —							
	<back next=""></back>		Cano	el			



The installation will run a command line script as part of the installation:



The script will close itself after completing.

When the installation is successfully completed the below screenshot will be displayed. Click **[Finish]** to close the installation.

ANSYS Motor-CAD_15_0_5 - InstallAware Wizard —		\times
ANSYS [®] Motor-CAD		
Completing the InstallAware Wizard for ANSYS Motor-CAD_15_0_5		
You have successfully completed the InstallAware Wizard for ANSYS Motor-CAD_15_0_5.		
To close this wizard, click Finish.		
< <u>B</u> ack Finish	Cano	cel



2. Running Motor-CAD for the first time

i. ActiveX Automation

Motor-CAD's ActiveX server must be registered to enable the use of ActiveX automation.

If this is the first version of Motor-CAD to be installed a computer, it must be restarted in order to complete the ActiveX registration. This is because Motor-CAD updates the registry for ActiveX, and Windows does not reread the associated registry settings until Windows is restarted.

If there are previous versions of Motor-CAD already installed, the latest version will automatically register itself for ActiveX when it is first run.

The registration of Motor-CAD's ActiveX server can be confirmed by checking the information available from **Defaults->ActiveX Registration:**

ActiveX Registration	×				
Batch file location:					
c:\ANSYS_Motor-CAD\Shared Files\	ActiveX.bat				
Version Info					
Registered version: 15.0.5					
C:\ANSYS_Motor-CAD\15_0_5\Mot	tor-CAD_15_0_5.exe				
Current version: 15.0.5					
C:\ANSYS_Motor-CAD\15_0_5\Mot	tor-CAD_15_0_5.exe				
Update to current version	Register other version				
Disable ActiveX for this instance of	of Motor-CAD				
Hide command window when lau	nching Motor-CAD				
Client selection					
Multiple (default) OK					
◯ Single					



ii. Verifying licence information

When Motor-CAD is run it will checkout the licence from the licence server. The licence information in Motor-CAD can be viewed by from the **Help->About...** pull down menu in Motor-CAD. A typical example of the screen displayed is shown below:





iii. Running Motor-CAD E-Magnetic Solver for first time

The Motor-CAD FEA module writes results files to the hard disk. To check that there is no problem writing these files to the hard disk run the E-Magnetic FEA solver. First, make sure that Motor-CAD is in the Magnetic context by selecting **Model -> E-Magnetic** (the background of tabs will become blue to show that E-Magnetic context is selected):

ANSYS Motor-CAD v15.0.5 (No File) DEVELOPMENT RELEASE							
File	Edit	Model	Motor Type	Options	Defaults	Editors V	iew
🖸 Geometry		E	-Magnetic	Ctrl+M	alculatio	n 🛛 🌽 E-M	lagne
OF	Radial	Т	hermal	Ctrl+T			
Slot Type:		Ξ.	ab	Ctrl+B	inface Pa	arallel v	
Stator Ducts		Ξ.	An alta and and	CH L	one	~	
Stator P			lechanical	Ctrl+L	eters	Value	

Then navigate to the **Calculation** tab and click the solve button shown below.

ANSYS Motor-CAD v15.0.5 (No File)* DEVELOP	MENT RELEASE		– 🗆 X
File Edit Model Motor Type Options Defa	<u>ults Edit</u> ors View Results Tools Licence	Print Help	
💽 Geometry 🛛 🌄 Winding 🛛 🕼 Input Data 👫 Cal	culation 🛛 🔗 E-Magnetics 🛛 🖽 Output Data 🛛 🔛	Graphs 🛛 🖓 Sensitivity 🔁 Scripting	
Drive:	Temperatures:	Performance Tests:	
Shaft Speed: 3000	Armature Winding Temperature: 40	Single operating points:	
Line Current Definition:	Magnet Temperature: 20		
ORMS	Stator Lamination Temperature: 20	Q axis current only	
O RMS Current Density	Rotor Lamination Temperature: 20	M On Load	
Peak Current: 5	Shaft Temperature: 20	Open Circuit:	
RMS Current: 3.536	Airgap Temperature: 20		
RMS Current Density: 5.159	Bearing Temperature [F]: 20	Cogging Torque Electromagnetic Forces	
DC Bus Voltage: 100	Bearing Temperature [R]: 20	On Load	
Phase Advance [elec deg]: 0	E-Magnetic ↔ Thermal Coupling:		
Drive:	E-Magnetic ↔ Thermal Coupling:		
Drive Type: Defined Currents (Default)	○ F-Magnetic Losses → Thermal		
Calculated Currents	○ E-Magnetic ← Thermal Temperatures		
Drive Mode:	O Iterate to Converged Solution	Parameters:	
Sine	Skew:	Self and Mutual Inductances	
Square	Skew Type: Stator Skew: 0		
Custom Passive Generator	None (default) Stator	Transient:	
	O Rotor	Sudden short-circuit	
Winding Connection:		Rotor Stresses:	
Star Connection (default)		Centrifugal Forces	
O Deita Connection			
Magnetisation:		Solve E-Magnetic Model	
Parallel			
◯ Radial		Cancel Solving	
O Halbach Continuous Ring Array			
O Halbach Sinusoidal Array			
			2021
		25 November	2021 www.motor-design.com

If an error occurs then check that the user has read/write access to the folder

C:\ANSYS_Motor-CAD\xx_x_x\FEResultsData\



3. Troubleshooting

i. Licence problems

If the licence server cannot be found, then an error message such as the following will display:

ANSYS Motor-CAD X	<
Unable to check out feature: motorcad ANSYS LICENSE MANAGER ERROR Request name motorcad does not exist in the licensing pool. License server machine is down or not responding. See the system administrator about starting the license server system, or make sure you're referring to the right host (see LM_LICENSE_FILE). Feature: motorcad Hostname: my'servername License path: 1055@my'servername; FlexNet Licensing error:-96,7. System Error: 11001 "WinSock: Host not found (HOST_NOT_FOUND)" OK	
Show future messages in window	

Please refer to Appendix B for information on how to reconfigure the licensing.



Appendix A: System Requirements

i. Minimum System Requirements

The following Operating Systems are supported:

- Windows 7 (64 bit)
- Windows 8 (64 bit)
- Windows 10 (64 bit)

Processor: Intel i7 2GHz or equivalent At least 2GB of memory At least 1GB of hard disk space Minimum screen resolution of 1024 x 768 with at least 256 colours Microsoft compatible mouse

Note: Motor-CAD does not support large fonts in Windows.

ii. Optimal system configuration

For optimal configuration of Motor-CAD there are a few different considerations:

- Motor-CAD BPM Lab will make use of multiple threads in order to build the motor model. To allow this to be done 12 to16 hardware cores/threads is recommended. There is not any increase in performance with more than 16 cores.
- All other machine and calculation types will benefit from a high clock speed as they use single-threaded calculations.
- Installing Motor-CAD and running models from an SSD drive will allow Motor-CAD to run more quickly due to quicker file access. It is recommended to run models from a local drive as the results files are saved relative to the model file.



Appendix B: Changing the Licence Server

By default, Motor-CAD uses a file called ansyslmd.ini in a predefined location to find the licence server. The server being used can be changed directly in the Motor-CAD interface. Select **Licence->Configuration** from the pull-down menu in Motor-CAD:

🇱 ANSYS N	Motor-CAD v15.0.4 (Ne	o File) DEVELOPM	ENT RELEASE					
File Edit I	Model Motor Type	Options Defau	lts Editors View	/ Results	Tools Licer	nce Print	Help	
Geometry	🛛 🌄 Winding 🛛 🛃 In	put Data 🛛 🚺 Cale	ulation 🛛 🤣 E-Mag	netics 🛛 🖽 🕻	Dutput D	Configura	tion	Scripting
Radial	🛨 Axial 🛛 🝽 3D							

The Licence configuration window shows the location of the ansyslmd.ini file, and the server currently in use.

To change the licence server, change the Server line to the correct information, and click **[Update]** as shown below.

Licence Configuratior		×
Licence System: ANSYS	Licence Checkout: At startup (default)	Update
◯ FlexLM	◯ When required	Close
Licence INI File:	C:\ANSYS_Motor-CAD\Shared Files\Licensing\ansyslmd.ini	
	1055@server	
Requested Licences	7	
Motor-CAD		
PM		
IM [
SYNC		

Motor-CAD now needs to be restarted in order for any changes to take effect:





After restarting Motor-CAD now go back to the licence configuration page are select the licences you wish to use by selecting the checkboxes as shown below then clicking on **[Update]**

Licence Configuration	1	×
Licence System: ANSYS	Licence Checkout:	Update
	O When required	Close
Licence INI File:	C:\ANSYS_Motor-CAD\Shared Files\Licensing\ansyslmd.ini	
	1055@server	
Requested Licences		
Motor-CAD	1	
PM		
M M		
SYNC		
	-	

If the selected licences have been checked out then boxes will be highlighted in green. If a selected licence cannot be checked out then it will be highlighted in red.

Licence Configuration		×
Licence System:	Licence Checkout: (••• At startup (default) ••• At startup (default) ••• At startup (default)	Update
	O When required	Close
Licence INI File: C:\	NSYS_Motor-CAD\Shared Files\Licensing\ansyslmd.ini	
10	5@server	
Requested Licences:		
Motor-CAD		
🖂 РМ		
M IM		
SYNC		

Motor-CAD is now ready to be used.



Appendix C: Using an Environment Variable

As an alternative to the ansyslmd.ini file, a windows environment variable **ANSYSLMD_LICENSE_FILE** can be used to point to the licence server.

If the environment variable is used it is prioritised over the ansyslmd.ini detailed in the previous section.

To set up the windows environment variable from windows system control panel select the **Advanced System Settings** as shown below:





Now click the **environment variables** button:

System Properties	\times
Computer Name Hardware Advanced System Protection Remote	
You must be logged on as an Administrator to make most of these changes. Performance	
Visual effects, processor scheduling, memory usage, and virtual memory Settings	
User Profiles	1
Desktop settings related to your sign-in	
S <u>e</u> ttings	
Startup and Recovery]
System startup, system failure, and debugging information	
Se <u>t</u> tings	
Enviro <u>n</u> ment Variables	
OK Cancel Apply	



Add a new environment variable entry by clicking on New:

DneDrive Path	C:\Users\dougie.hawkins\OneDrive	
Path		
	C:\Users\dougie.hawkins\AppData\Local\Microsoft\WindowsApps;	
EMP	C:\Users\dougie.hawkins\AppData\Local\Temp	
MP	C:\Users\dougie.hawkins\AppData\Local\Temp	
tem variables	<u>N</u> ew <u>E</u> dit <u>D</u> elete	
/ariable	Value	^
/ariable /ATHEXT	Value .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC	^
/ariable /ATHEXT /ROCESSOR_ARCHITECTURE	Value .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC AMD64	^
/ariable /ATHEXT /ROCESSOR_ARCHITECTURE /ROCESSOR_IDENTIFIER	Value .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC AMD64 Intel64 Family 6 Model 42 Stepping 7, GenuineIntel	^
/ariable /ATHEXT /ROCESSOR_ARCHITECTURE /ROCESSOR_IDENTIFIER /ROCESSOR_LEVEL	Value .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC AMD64 Intel64 Family 6 Model 42 Stepping 7, GenuineIntel 6	^
/ariable ATHEXT PROCESSOR_ARCHITECTURE PROCESSOR_IDENTIFIER PROCESSOR_LEVEL PROCESSOR_REVISION	Value .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC AMD64 Intel64 Family 6 Model 42 Stepping 7, GenuineIntel 6 2a07	^
/ariable PATHEXT PROCESSOR_ARCHITECTURE PROCESSOR_IDENTIFIER PROCESSOR_LEVEL PROCESSOR_REVISION SModulePath	Value .COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC AMD64 Intel64 Family 6 Model 42 Stepping 7, GenuineIntel 6 2a07 %ProgramFiles%\WindowsPowerShell\Modules;C:\WINDOWS\syst	^
/ariable	Value	

Then add the **ANSYSLMD_LICENSE_FILE** variable.

The value field needs to have point to the licence server computer. The example shown below shows the server name as SERVER, using port 1055 (the definition is PORT@SERVER).



Edit User Variable		X
Variable <u>n</u> ame: Variable <u>v</u> alue:	ANSYSLMD_LICENSE_FILE	
Browse <u>D</u> irectory	Browse <u>F</u> ile	OK Cancel

Now click on **OK** to add this new system variable:

Edit User Variable		×
Variable <u>n</u> ame:	ANSYSLMD_LICENSE_FILE	
Variable <u>v</u> alue:	1055@SERVER	
Browse <u>D</u> irectory	Browse <u>File</u> OK Cancel	

The environment variable should now be shown in the table as shown below. Now click on **OK** to confirm the changes.

Variable	Value
ANSYSLMD_LICENSE_FILE	1055@SERVER
ComSpec	C:\WINDOWS\system32\cmd.exe
DriverData	C:\Windows\System32\Drivers\DriverData
ESET_OPTIONS	
ICEMCFD_SYSDIR	win64_amd
LSTC_LICENSE	ANSYS
MOTORCAD ACTIVEX	"D:\ANSYS Motor-CAD\13 0 13\\Shared Files\ActiveX.bat"
	Ne <u>w</u> Ed <u>i</u> t De <u>l</u> ete

The System properties window, and any open copies of Motor-CAD be closed for the changes to be finalised.



After doing this then start Motor-CAD from the windows start menu.

Now select the licences for modules that you wish to use from the Licence Configuration page (**Menu->Licence->Configuration**) and click on the [**Update]** button.

Licence Configuration		×		
Licence System: ANSYS	Licence Checkout:	Update		
○ FlexLM	◯ When required	Close		
Environment Variable: ANSYSLMD_LICENSE_FILE				
	1055@server			
Requested Licences:	1			
Motor-CAD PM IM SYNC				

The configuration page shows that Motor-CAD is using the **ANSYSLMD_LICENSE_FILE** environment variable, and the port and server in use.

Licences that are available and have been checked out will by highlighted in lime and any modules unavailable will be highlighted in red.

Now click the **OK** button to use Motor-CAD with the enabled licences.

Motor-CAD is now ready to be used.



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