

MOTOR MDO PROCESS: GETTING STARTED

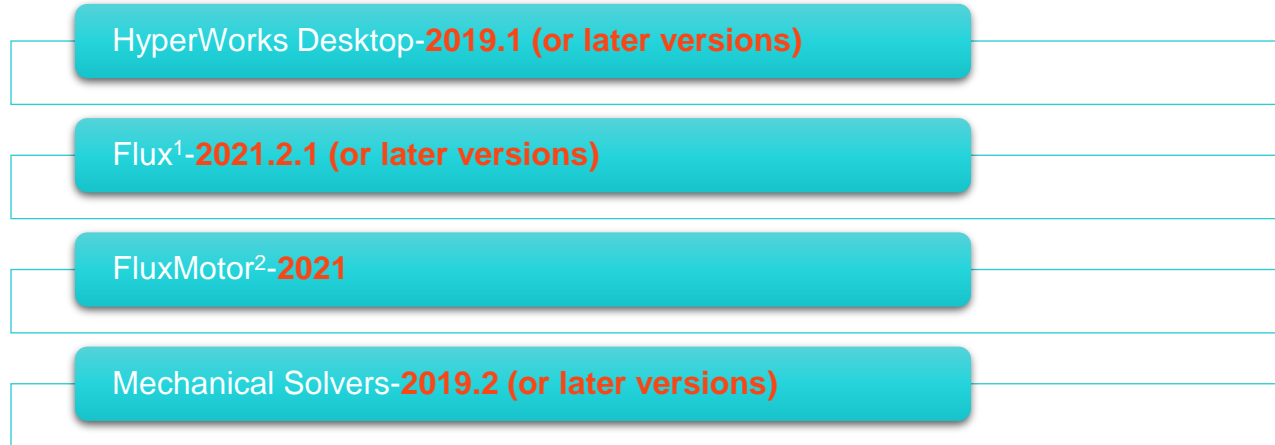
ALTAIR MULTIDISCIPLINARY DESIGN OPTIMIZATION PLATFORM
FOR ELECTRIC MOTORS

October 2021, Altair Flux / FluxMotor Valorization and Support Team

SOFTWARE REQUIREMENT

SOFTWARE REQUIREMENT

- Software (and the required versions) using in the Altair Multidisciplinary Design Optimization platform for electric motors:

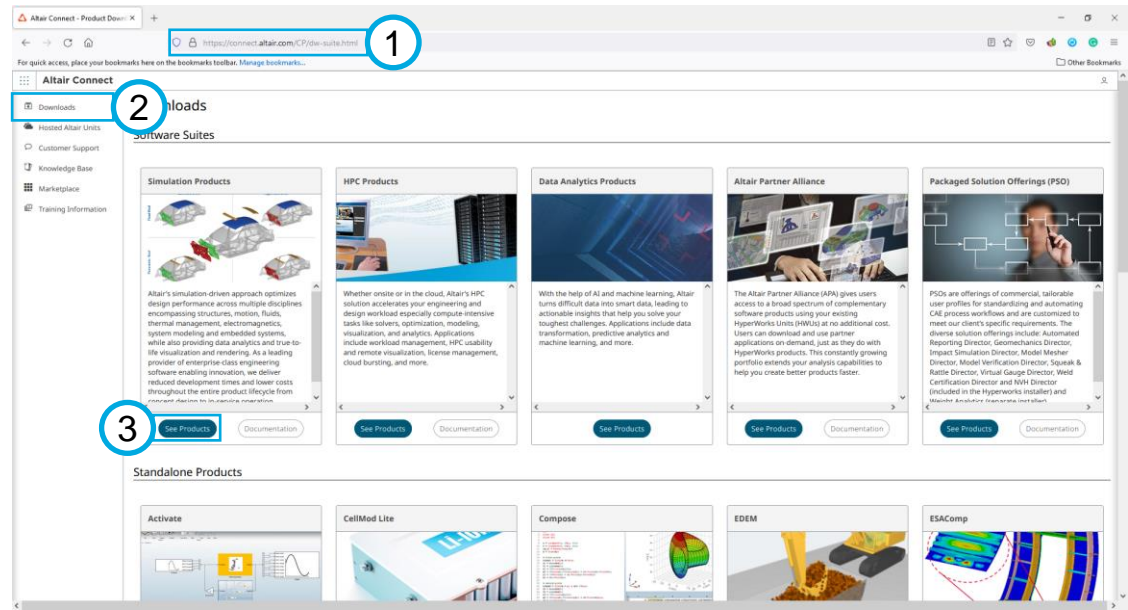


- The latest versions are recommended to build the MDO platform.
- Total Altair HyperWorks Unit (HWU) number required in the project is **30**.

SOFTWARE REQUIREMENT

- Software download
 - Using the Altair Connect system

Step	Action
1	Go to Altair Connect : https://connect.altair.com/
2	Click on [Download]
3	Click on [See Products] in the “Simulation Products”



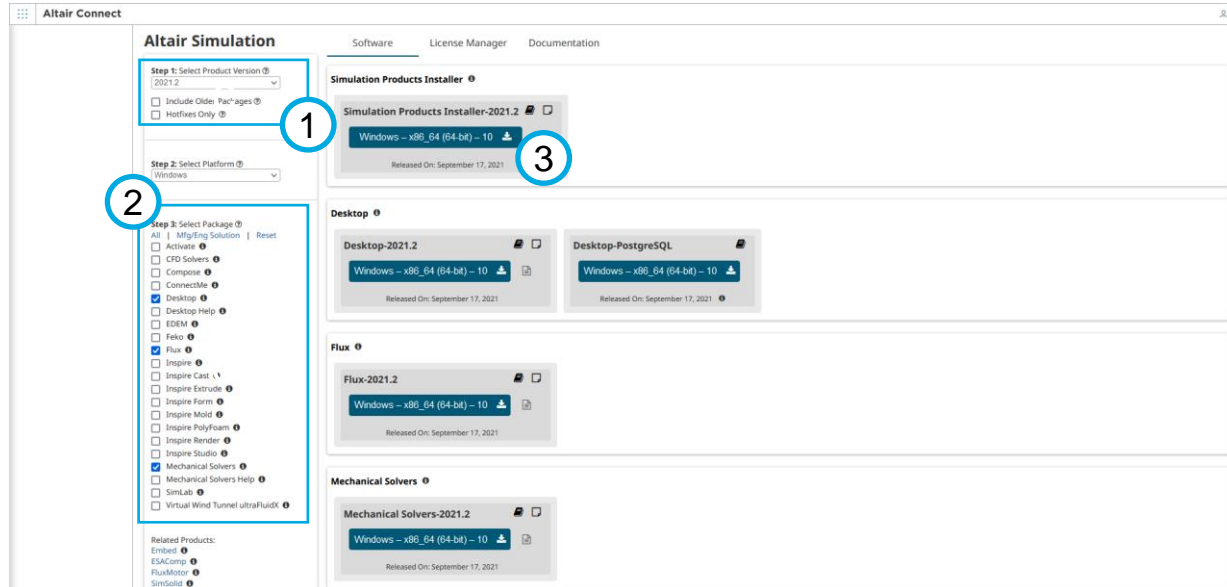
SOFTWARE REQUIREMENT

- Software download
 - Desktop, Flux, and OptiStruct

Step	Action
1	Select the software version
2	Choose the next software packages: <ul style="list-style-type: none"> • Desktop • Flux • Mechanical Solvers
3	Download and install them

Notes:

- 1) Altair HyperStudy and Altair HyperMesh are contained in **Desktop** package
- 2) Altair OptiStruct is contained in **Mechanical Solvers** package
- 3) Installation of newest version is strongly recommended



SOFTWARE REQUIREMENT

- Software download
 - FluxMotor

Step	Action
1	In “related products”, click on FluxMotor
2	Select the newer version and your operative system
3	Download and install FluxMotor

Altair Simulation

Step 1: Select Product Version ⓘ
2021.2

☐ Include Older Packages ⓘ
☐ Hotfixes Only ⓘ

Step 2: Select Platform ⓘ
Windows

Step 3: Select Package ⓘ
All | Mfg/Eng Solution | [Reset](#)

☐ Activate ⓘ
☐ CFD Solvers ⓘ
☐ Compose ⓘ
☐ ConnectMe ⓘ
☐ Desktop ⓘ
☐ Desktop Help ⓘ
☐ EDEM ⓘ
☐ Feko ⓘ
☐ Flux ⓘ
☐ Inspire ⓘ
☐ Inspire Cast ⓘ
☐ Inspire Extrude ⓘ
☐ Inspire Form ⓘ
☐ Inspire Mold ⓘ
☐ Inspire PolyFoam ⓘ
☐ Inspire Render ⓘ
☐ Inspire Studio ⓘ
☐ Mechanical Solvers ⓘ
☐ Mechanical Solvers Help ⓘ
☐ SimLab ⓘ
☐ Virtual Wind Tunnel ultraFluidX ⓘ

Related Products:
Embed ⓘ
ESAComp ⓘ
FluxMotor ⓘ
SimSolid ⓘ

Product Downloads

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Altair FluxMotor

Software License Manager Documentation

FluxMotor ⓘ

FluxMotor-2021 ⓘ ⓘ

Windows – x86_64 (64-bit) – 7/10 ⓘ ⓘ

Released On: September 27, 2021

Step 1: Select Product Version ⓘ
2021

☐ Include Older Packages ⓘ
☐ Hotfixes Only ⓘ

Step 2: Select Platform ⓘ
Windows

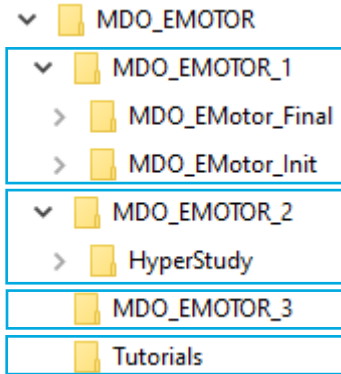
Step 3: Select Package ⓘ
All Packages | [Reset](#)
☒ FluxMotor ⓘ

Related Suite:
Simulation Products ⓘ

MDO PROJECT TUTORIALS

MDO PROJECT TUTORIALS

- Three different ways are possible to reproduce the tutorial about multidisciplinary optimization design for motor:



Case 1: MDO EMotor project step by step

- All the connectors will be generated by users

Case 2: MDO EMotor study step by step

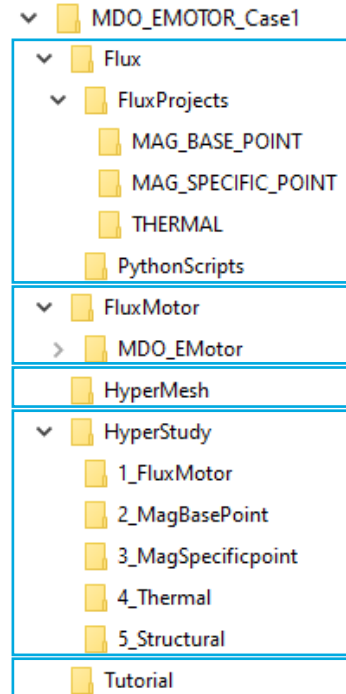
- All the connectors and command scripts are prepared

Solution 3: MDO EMotor completed study archive

- User can run HyperStudy by importing the archive

MDO PROJECT TUTORIALS

- Solution 1: MDO EMotor project step by step
 - In this solution, different Altair software will be used to create connectors for optimization in HyperStudy.



Step 2: Flux project

Step 1: FluxMotor project

Step 3: HyperMesh / OptiStruct project

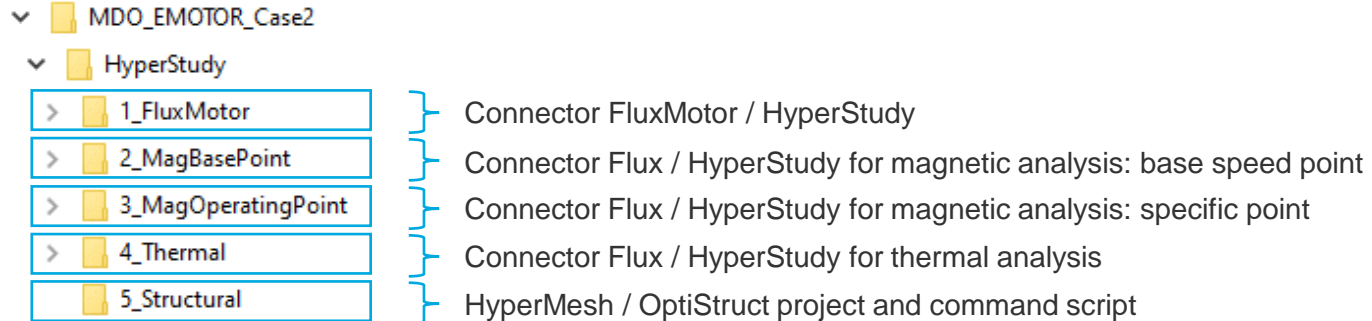
Step 4: HyperStudy project

Tutorial document

The starting point
is a predefined
FluxMotor catalog

MDO PROJECT TUTORIALS

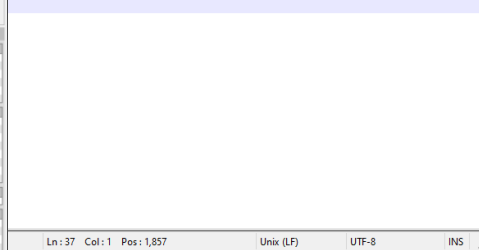
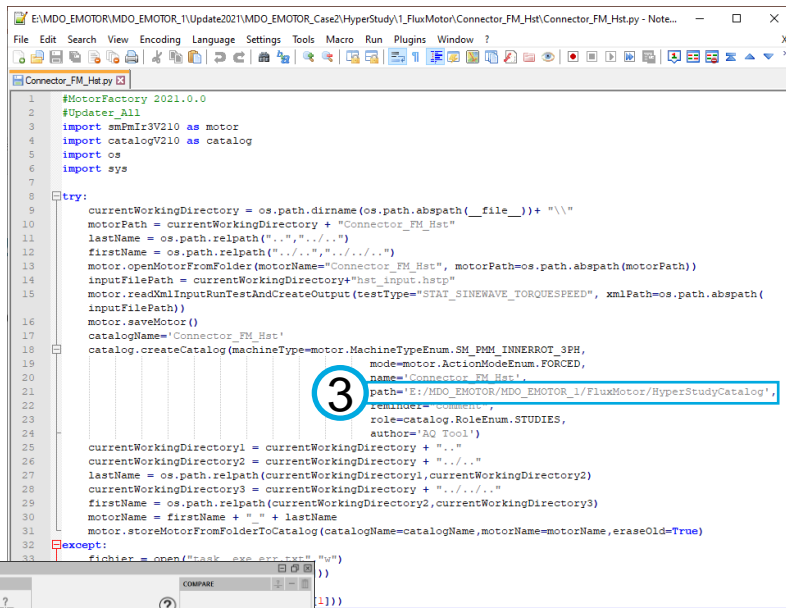
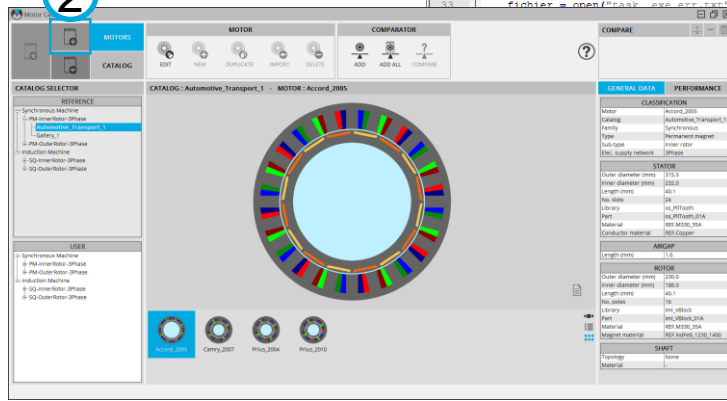
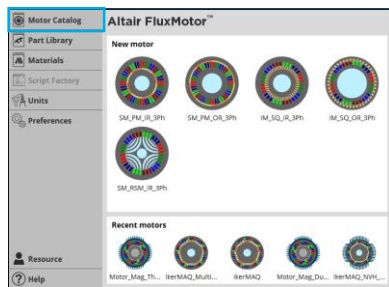
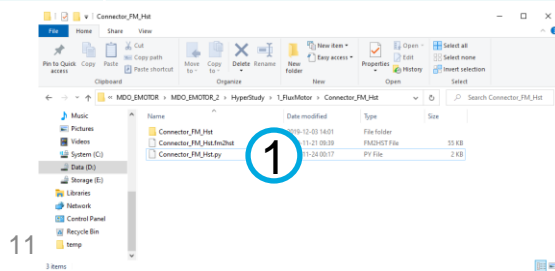
- Solution 2: MDO EMotor project begins by “Connectors”
 - In this solution, all the connectors for multidisciplinary analysis are prepared. Only the HyperStudy project need to be created for the optimization step.
 - Please create a FluxMotor Catalog before running the optimization in HyperStudy. This Catalog will be used to save all the designs during the optimization step.



MDO PROJECT TUTORIALS

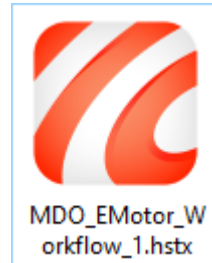
- Solution 2: MDO EMotor project begins by “Connectors”
 - Create a FluxMotor Catalog for optimization

Step	Action
1	Open the file “~\MDO_EMOTOR_Case2\HyperStudy\1_FluxMotor\Connector_F M_Hst\Connector_FM_Hst.py”
2	Create a FluxMotor Catalog named “Connector_FM_Hst”.
3	Update the FluxMotor Catalog path with the Catalog create in step 2



MDO PROJECT TUTORIALS

- Solution 3: MDO EMotor project begins by importing the HyperStudy project
 - The optimization process can be reproduced in HyperStudy by importing directly the archive file (~\MDO_EMOTOR_Case3\MDO_EMotor_Workflow_1.hstx)



- Please create a FluxMotor Catalog before running the optimization in HyperStudy (please refer to page 11). This Catalog will be used to save all the designs during the optimization step.
- Please check the solver definition in HyperStudy before running the optimization (please refer to the tutorial document *05A_HyperStudy_Initiation*, page 6-8).



THANK YOU

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