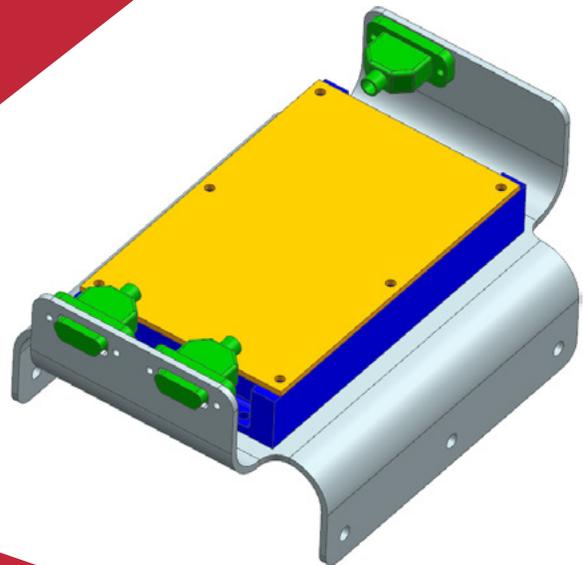


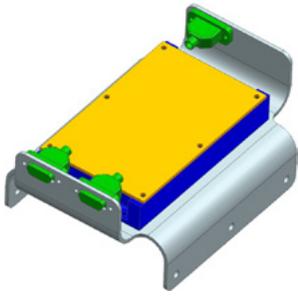
NX II

WHITEPAPER

NX: Changing Units in an Assembly



Changing Units in an Assembly in NX



Software:
NX 11

Overview

Creating assemblies with multiple parts that have inconsistent units can cause problems when components are created and referenced, as well as in the simulation files. To avoid challenges and analysis errors, it is best to use a single system of measurement throughout the model tree. This paper explains how to check units in an NX file and how to use an NX utility to change the units for an assembly file and all referenced part files.

This whitepaper is part of a series of free Siemens PLM Software training resources provided by ATA. For more whitepapers, tutorials, videos, and macros, visit ATA's PLM Software website: <http://www.ata-plmsoftware.com/resources>.

Changing Units in an Assembly in NX

Methods for Checking Units

Before running the utility, it is a good idea to check the assembly's current units. There are several methods for finding out what units are active in the assembly. Three methods are discussed below.

1. Measurement units
2. Displayed part properties
3. Loaded parts information

Measurement Units

A quick and easy way to check a part's units is to use the *Measure Distance* command (or any of the measure commands). Simply open the command and select something to measure. A unit will be shown next to the measurement, which will allow you to determine the units of the assembly.

Additionally, the *Units Information* command will display the units for all the different measurements in the Information window, as shown in Figure 1. Find the command with the Command Finder, or at Menu → Analysis → Units Custom. The units farther down the list, as well as those that make up the majority, are good indicators of the units being used in the assembly.

Measure	Unit Name	Display Name
Length	Inch	in
Area	SquareInch	in^2
Volume	CubicInch	in^3
Mass	PoundMass	lbm
Mass Density	PoundMassperCubicInch	lbm/in^3
Fatigue Strength Coefficient	PoundForcePerSquareInch	lbf/in^2 (psi)
Time	Second	sec
Angle	Degrees	degrees
Velocity	InchPerSecond	in/sec
Acceleration	InchPerSquareSecond	in/sec^2
Force	PoundForce	lbf
Force Per Unit Length	PoundForcePerInch	lbf/in
Pressure	PressurePoundForcePerSquareInc	lbf/in^2 (psi)
Moment	PoundForceInch	lbf-in
Stress	StressPoundForcePerSquareInch	lbf/in^2 (psi)
Strain	Strain_English1	in/in
Strain Energy	StrainEnergy_English1	lbf-in
Strain Energy Density	StrainEnergyDensity_English1	lbf-in/in^3
Temperature	Fahrenheit	F
Heat Flux	HeatFlux_English1	Btu/sec-in^2

Figure 1: ►

A section of what the Information window will display. There are many more measures not shown.

However, since it is possible to change units for individual measurements by using the *Units Manager* command, the units for a length, area, or mass may not represent the entire model.

Changing Units in an Assembly in NX

Displayed Part Properties

The units of an individual part file can be found on the *Displayed Part* tab of *Displayed Part Properties*, located at File → Properties.

Loaded Parts Information

To view the units of all part files in an assembly, open the top-level assembly file and select Menu → Information → Part → Loaded Part. All loaded assembly parts will be displayed in the table, which includes a part file's units alongside additional file information.

Changing Units of Existing Assemblies and Their Parts

Units must be changed before creating any CAE files like i-parts, FEMs, or SIMs, and none of the files to be changed may be open in NX when the command is run. The following is the utility to change units:

“C:\Siemens\NX 10.0\UGII\ug_convert_part.exe”

“C:\Siemens\NX 11.0\NXBIN\ug_convert_part.exe”

Note that the path has changed beginning with NX 11. In addition, the NX version identifier is in the path, so the path must be correct for the version being used. The command can be run on individual parts if necessary. The NX documentation gives examples of the available qualifiers, or the command can simply be entered with no qualifiers and the options will be listed:

Options:

[-in <filename>]	converts file <filename> to inches
[-mm <filename>]	converts file <filename> to millimeters
[-d]	sets the current directory as the source
[-d <dirname>]	sets directory <dirname> as the source
[-o <dirname>]	sets existing directory <dirname> as the destination
[-s]	traverses subdirectories
[-u]	converts udf files
[-uo]	converts udf files only
[-x]	exports the expressions of the converted part
[-y]	converts entire assembly

Dimensional data like lengths and coordinates are modified with a conversion factor, and nondimensional data such as angles are not affected. The conversion maintains the physical size of the model. Visit the Help for additional commentary on converting expressions and spreadsheets.

Changing Units in an Assembly in NX

To run the utility, open the command prompt and make sure you are in the same directory as the file that will be updated. Enter the command (including the quotations) and any qualifiers needed to convert the file and press Enter.

Example:

```
H:\NX Tutorial >"C:\Siemens\NX 10.0\UGII\ug_convert_part.exe" -y -mm
electronics_box_assy.prt
```

This would be the path for a file called “electronics_box_assy.prt,” which is located in the “NX Tutorial” folder of the H drive. The assembly is being converted to millimeters.

After the conversion, you can open the assembly and use any of the methods identified above to verify that the conversion was successful. Figure 2 displays the measurement units following the conversion.

Measure	Unit Name	Display Name
Length	MilliMeter	mm
Area	SquareMilliMeter	mm^2
Volume	CubicMilliMeter	mm^3
Mass	Kilogram	kg
Mass Density	KilogramPerCubicMilliMeter	kg/mm^3
Fatigue Strength Coefficient	NewtonPerSquareMilliMeter	N/mm^2 (MPa)
Time	Second	sec
Angle	Degrees	degrees
Velocity	MilliMeterPerSecond	mm/sec
Acceleration	MilliMeterPerSquareSecond	mm/sec^2
Force	Newton	N
Force Per Unit Length	NewtonsPerMilliMeter	N/mm
Pressure	PressureNewtonPerSquareMilliMe	N/mm^2 (MPa)
Moment	NewtonMilliMeter	N-mm
Stress	StressNewtonPerSquareMilliMete	N/mm^2 (MPa)
Strain	Strain_Metric1	mm/mm
Strain Energy	StrainEnergy_Metric2	N-mm
Strain Energy Density	StrainEnergyDensity_Metric2	N-mm/mm^3
Temperature	Celsius	C
Heat Flux	HeatFlux_Metric2	W/mm^2

Figure 2: ►

A section of the Information window after the units have been changed to the metric system.

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