Intelligent Fastener Extension 3.0

Trainings-Guide

IFX 3.0

Part 1:

Basic Training (Lite Version)

Table of Content

1 Introduction

1.1 Objective of this document

The objective of this document is to enable you to create fasteners with the new ***Intelligent Fastener Extension (IFX).***

It is assumed, that you are familiar with the basic functions of Creo.

1.2 Conventions

This Training-Guide uses the following conventions:

Assemble by mouse click	An Icon with text shows you, that you will have to select the shown command in the ribbon or in a dialog
Example	Bold font indicates important information
MMB	Middle mouse button
IFX	Intelligent Fastener Extension

2   General overview

With this release of Creo you will find the Intelligent Fastener features in the ribbon. To use them you need an opened assembly. The new features can be found in the **Tools** ribbon.
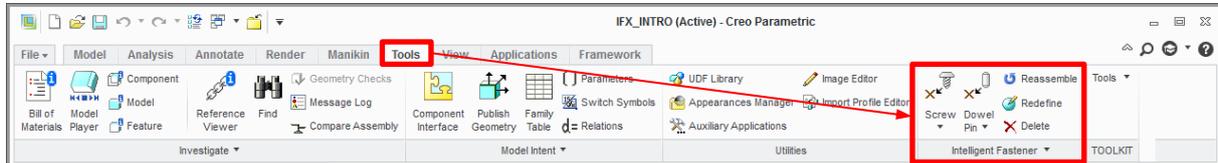
The Following options are available:

|		
	Assemble on point or axis	Assemble a Fastener on a point or an axis
	Assemble by mouse click	Assemble a Fastener by mouse click
	Assemble on point or axis	Assemble a dowel pin on a point or an axis *(Full version only!)*
	Assemble by mouse click	Assemble a dowel pin by mouse click *(Full version only!)*
	Reassemble	Reassemble an existing fastener
	Redefine	Redefine an existing fastener
	Delete	Delete an existing fastener. Also deletes holes created by IFX
	Check screw fasteners	Verify screw fasteners *(Full version only!)*
	Update holes	Update holes *(Full version only!)*
	Suppress	Suppress all fasteners in the current assembly
	Resume	Resume all fasteners in the current assembly
	Options	Change IFX options *(Full version only!)*
	User guide	Open the user guide
	Instance Creator	Create all instances of a fastener
	About intelligent fastener	Open the version dialog. Shows detailed version info

3   Assemble Fasteners

To assemble fasteners you have various options. It is possible to assemble on datum **points** or **axis**. Also existing holes can be used as reference. Another way to assemble fasteners is **by mouse click**. With this feature you simply select offset references and define the fastener position with mouse clicks.

3.1   Assemble fastener on datum or hole

To assemble fasteners on a datum perform the following steps:

1. Open the assembly you want to add fasteners to.
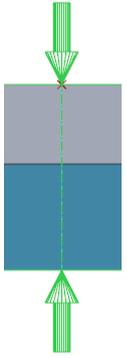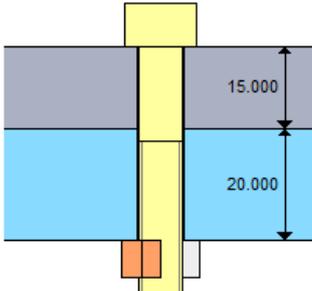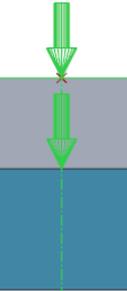2. Create a datum point or axis where a fastener should be assembled.
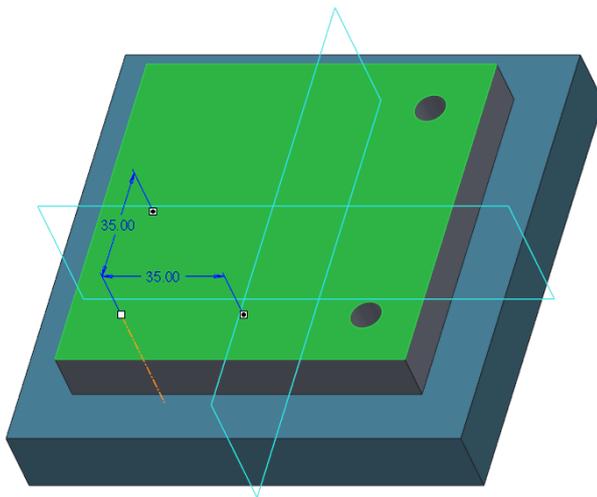
3. Select ⚙ Assemble on point or axis in the **Tools** tab of the ribbon.
4. Afterwards the **Select References** dialog shows up. You have to select three references:
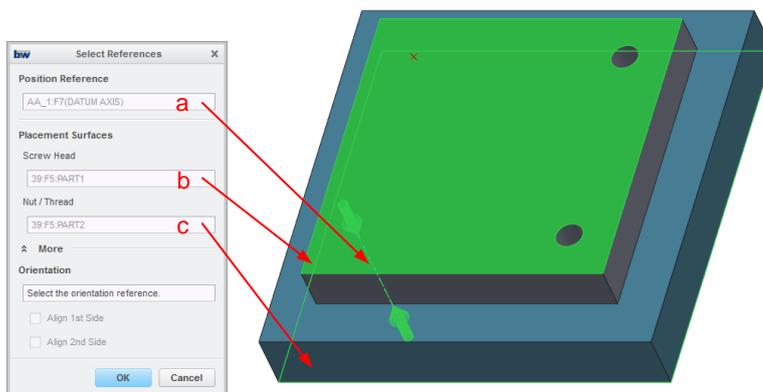
   a. Select an **axis/point** or **hole** as **Position Reference.**
   b. Select the surface for the **Screw Head** placement.
   c. Select the surface for the **Nut/Thread** placement.

Note:

Depending on the surface orientation ***IFX*** will create a ***Screw/Nut*** or ***Screw/Thread*** connection. This is also indicated by the green arrows in the model:

|	
	If two opposing surfaces have been selected you will see the following preview in the graphics area of Creo. This type of selection will result in a ***Screw/Nut*** connection*.*
	If two aligning surfaces have been selected you will see the following preview in the graphics area of Creo. This type of selection will result in a ***Screw/Thread*** connection**.**
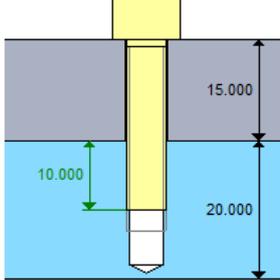
To finish the screw connections see chapter Screw Fastener Definition.

3.2 Assemble fasteners by mouse click

To assemble fasteners by mouse click perform the following steps:

1. Open the assembly you want to add fasteners to.
2. Select 🔩 Assemble by mouse click in the **Tools** tab of the ribbon.
3. Afterwards the **Select References** dialog shows up. You have to select four references:
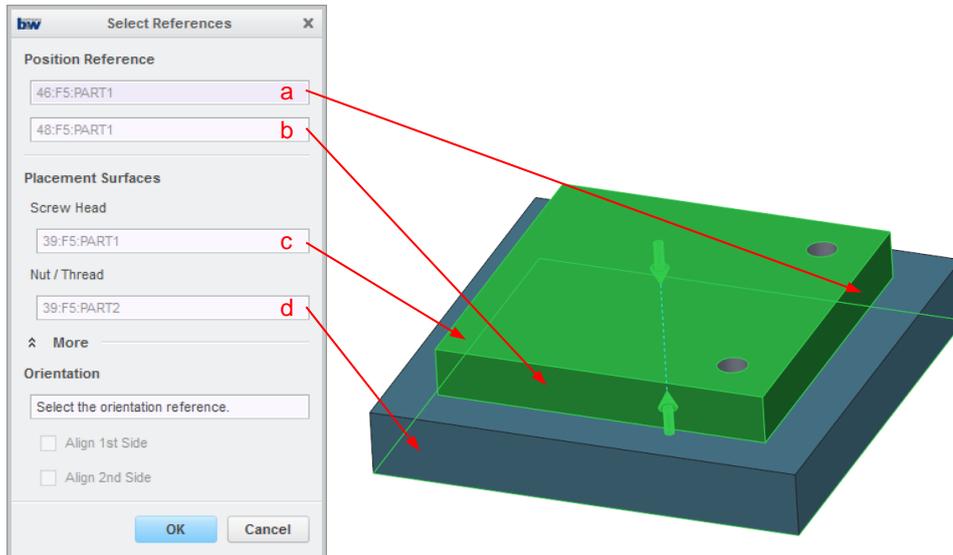
    a. Select one surface or plane as first position reference.
    b. Select another surface or plane as second position reference.
    c. Select the surface for the **Screw Head** placement.
    d. Select the surface for the **Nut / Thread** placement.

4. Configure the screw connection in the next dialog. See also chapter Screw Fastener Definition.
5. After the definition is complete you will see the desired connection is snapped to the mouse cursor.
6. To assemble a connection simply click on the desired location. The screw connection will be assembled and the required holes will be created.
7. To cancel the process press MMB.
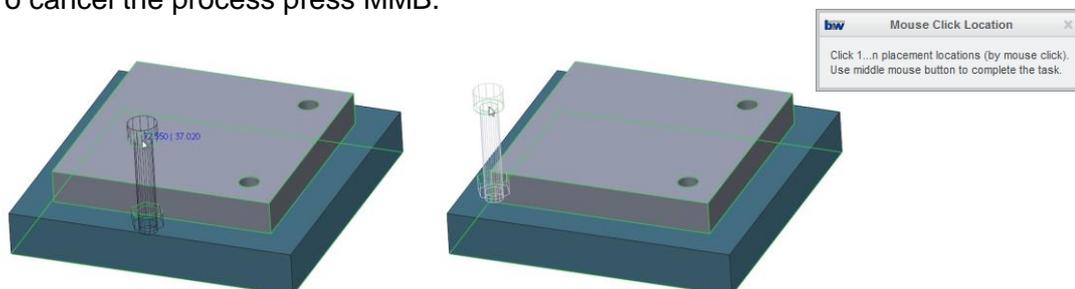
Note:

The numbers on the cursor show the dimensions relative to the selections made for positioning. If you leave a valid position the numbers disappear and the preview connection will be greyed out.

4   Screw Fastener Definition

The **Screw Fastener Definition** dialog gives you many different options to configure your fastener.

The dialog itself is split into different areas:

1. Catalog definition (mm/inch)
2. Connection definition
3. 2D Preview
4. Hole definition
5. 3D Preview, OK, Cancel
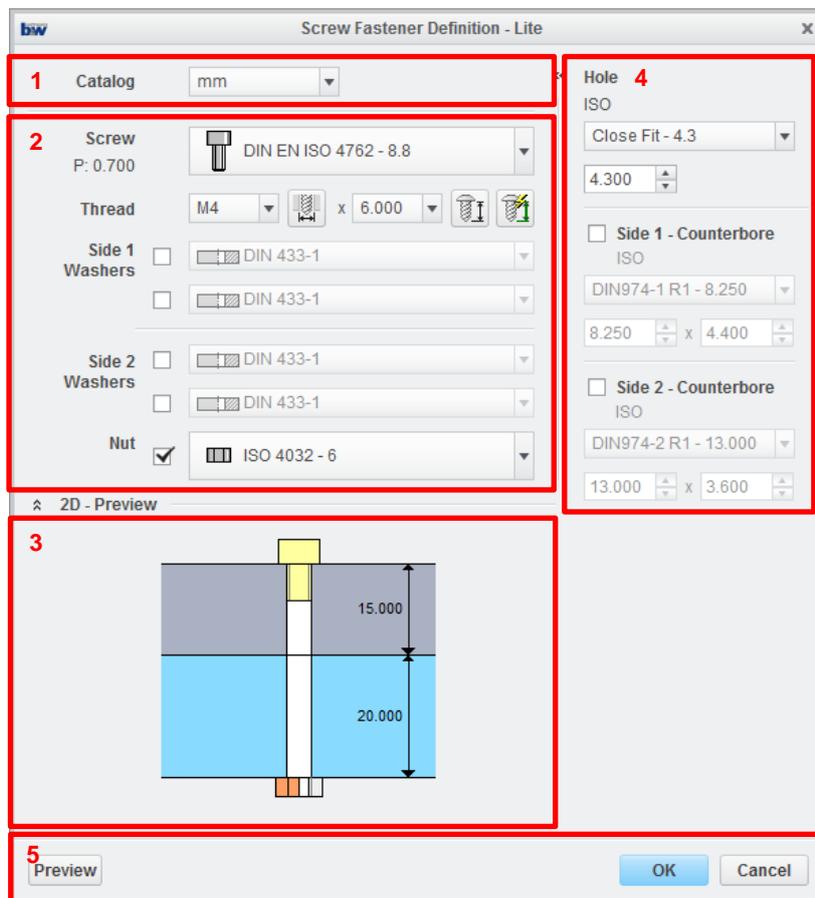
4.1   Catalog definition

In the **catalog definition** area you can choose between **mm** and **inch** standard parts.

4.2 Connection definition

The **connection definition** is the most important area of the dialog. Here you have several options to define the fastener connection you need.

Screw P: 0.700	DIN EN ISO 4762 - 8.8 ▼

Select different standards of screws (already predefined and can not be changed in the lite version!)

Thread	M4 ▼ **1** x 6.000 ▼ **2** **3**

Define the thread size and the screw length.

1. Measure the diameter of the screw in the model (select existing screw/hole).
2. Set the length autmatically (According to ISO standard).
3. Permanently set the length automatically everytime you change the diameter or open the dialog (stays enabled until restart of Creo).

Side 1 Washers	☐ DIN 433-1 ▼
	☐ DIN 433-1 ▼
Side 2 Washers	☐ DIN 433-1 ▼
	☐ DIN 433-1 ▼

Define Washers on Side 1 / Side 2. Where side 1 is on the screw side and side 2 is on the nut side. Here are also a lot of standards predefined and can not be modified in the lite version of IFX.

Nut ☑	ISO 4032 - 6 ▼

Select different standards of nuts (already predefined and can not be changed in the lite version!).

4.3 2D Preview

The **2D preview** always shows you the actual fastener configuration. Also the **selected references** will be measured and **dimensions** to the selected parts will be shown.
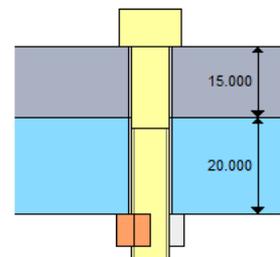
4.4 Hole definition

In the *hole definition* area you can select different hole standards and counter bores.

Hole ISO [Close Fit - 4.3 ▾] [4.300 ⬍]	
With the first option menu you can define *ISO Standard* hole diameters. With the second menu you can enter the diameter manually	
☐ **Side 1 - Counterbore** ISO [DIN974-1 R1 - 8.250 ▾] [8.250 ⬍] x [4.400 ⬍] ☐ **Side 2 - Counterbore** ISO [DIN974-2 R1 - 13.000 ▾] [13.000 ⬍] x [3.600 ⬍]	
The second part of the hole area is used to create *counter bores*. Here you have also a variety of standards predefined. They can also be modified manually.	

4.5 3D Preview, OK, Cancel

This is the last area of the dialog. You can *confirm* or *abort* the current operation in this area. You also have the possibility to generate a *3D Preview* to validate your fastener connection in the graphics area of Creo.
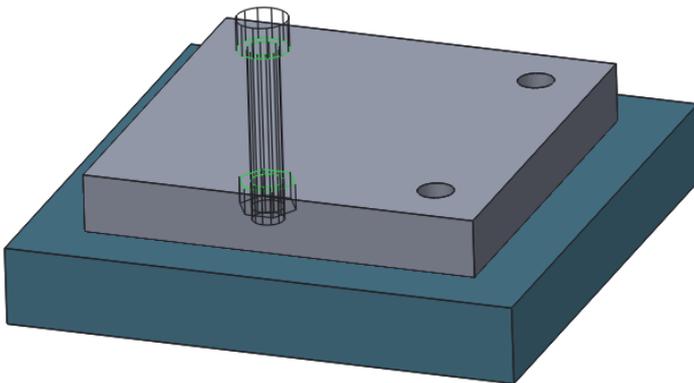
5   Special operations and recommendations

The last chapter of the tutorial will be dedicated to functions to modify or copy fastener connections and some general recommendations will be given.

5.1   Reassemble

To *reassemble* an existing fastener connection click the ⟳ Reassemble button in the ribbon of IFX and select the connection you want to reassemble.

Afterwards you will have to choose a *new placement reference*. It is also possible to choose *new position references* for the *screw head* and *nut/thread* position.

After you hit the *Apply* button the connection will be *reassembled*. The dialog for repositioning will then open again. You can either assemble more fasteners on other locations or quit the loop by pressing *Cancel*.

5.2   Redefine

To *redefine* an existing fastener connection click the ✎ Redefine button in the ribbon of IFX and select the connection you want to modify. Afterwards the *Screw Fastener Dialog* opens. You can now do modifications to the selected screw.

After confirmation via *OK* the existing fastener connection will be redefined.

If you redefine a reassembled connection all instances will be modified.

5.3   Delete

To delete an existing fastener connection click the ✕ delete button in the ribbon of IFX and select the connection you want to delete.

You will have to confirm your selection and afterwards the fastener connection and all holes or threads created by IFX will be deleted.

If you delete a reassembled connection you can choose to delete all instances or just the selected one.

5.4   Recommendations

There are some recommendations when working with IFX.

5.4.1   References of fastener connections

You should always keep in mind, that IFX creates external references. So you should make sure to select stabile references for your fasteners. In order to reduce datum references created by IFX you should always try to assemble screws on axis.
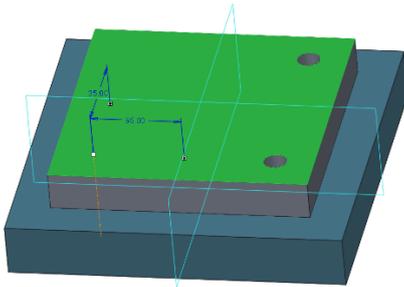
5.4.2 Pattern fastener connections

It is of course possible to pattern screw connections. To do so simply pattern your references (Point/Axis/Hole).
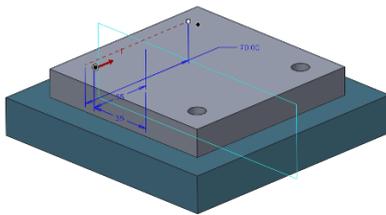
After the confirmation of the Screw Fastener Definition IFX will ask you if you want to pattern the fastener.
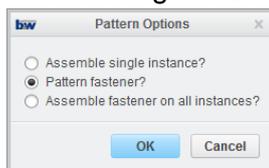
To do so perform the following tasks:

1. Create a reference axis.

2. Pattern the axis.

3. Assemble a fastener and use the axis as position reference (see: Assemble fastener on datum or hole).
4. Configure your connection (see: Screw Fastener Definition).
5. After closing the Screw Fastener Definition dialog you will see the following message:

   Options:
   a. **Asssemble single instance:** Only assemble the connection on the selected position.
   b. **Pattern fastener:** Uses the patterned axis you chose earlier and assembles multiple connections.
   c. **Assemble fastener on all instances:** This feature is only enabled in the Full version!
6. Choose the option **Pattern fastener?** and press OK .

The chosen fastener will be patterned on all instances of the patterned axis.

6 Impressum

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