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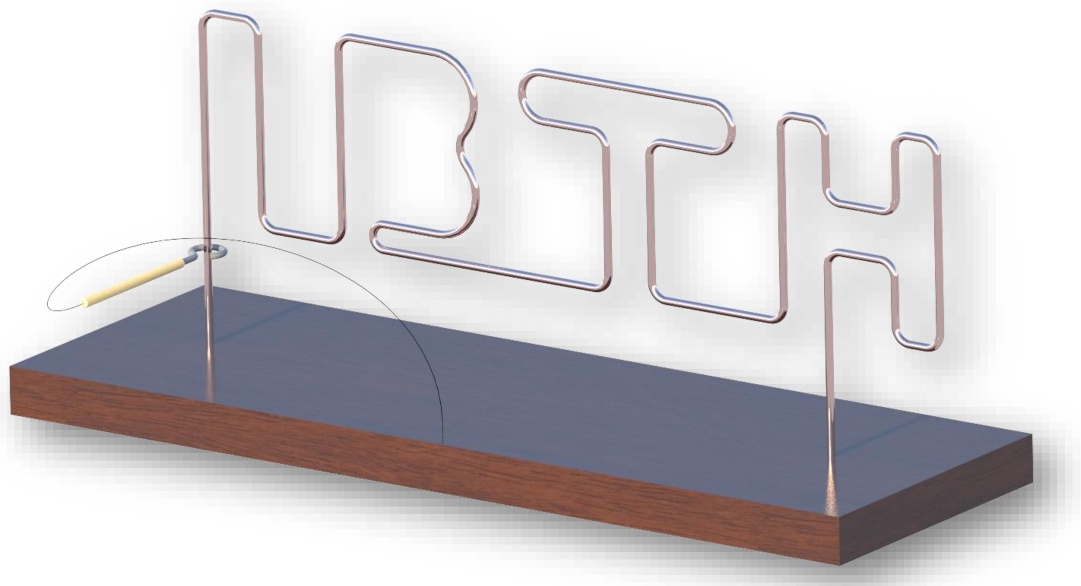
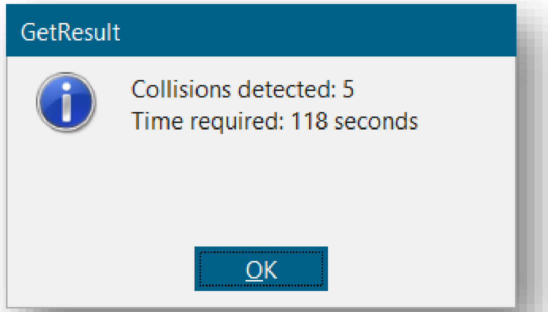
engineering & consulting




GetResult

Collisions detected: 5
Time required: 118 seconds

PRE- / POST-Actions | CAD Buzz Wire

Mosbach, 12.12.2022

Friedrich-Ebert-Straße 11 - 74821 Mosbach - info@ibth-consulting.de

[INTRODUCTION]

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Introduction

Important Notes

- Please consult with your NX administrator / check your company's policies whether you are allowed to use VB scripts and set environment variables yourself.
- Users of this service do so at their own risk.
- Experience in assembly topics is needed (some topics are not explained in detail!).
- You need write permission on your computer.
- Syslog file should be on the standard folder location:
  C:\Users\hilkert\AppData\Local\Temp\hilkertb1a05bef.syslog
- Experience in admin topics (create environment variable).

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Versions – supported / tested

supported versions

- NX1899
- NX1926
- NX1953
- NX1980
- NX2007

Not supported

- ~~NX2206~~

[WHAT IS THE BUZZ WIRE GAME]

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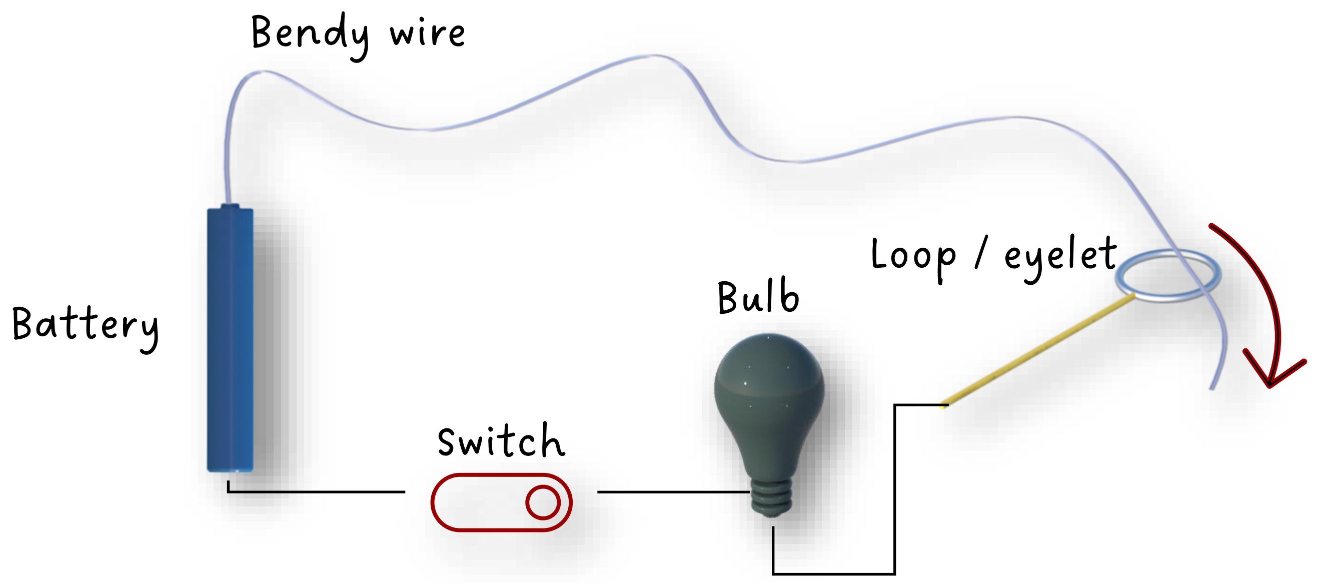
What is the buzz wire game

- The buzz wire is a game of skill.
- The aim is to guide a wire eyelet over a bent wire as quickly as possible without touching it with the eyelet.
- If the eyelet is touched, it is a fault.
- The game can also be played over time.

How it works in reality...



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How it works in NX

Movement

The main function is the move component. In context with a PRE-Action it is possible to stop the time from calling to closing the command.

Furthermore the collisions can be count (POST-Action) if the collisions are acknowledged by the user.

A dialog window shows the result.

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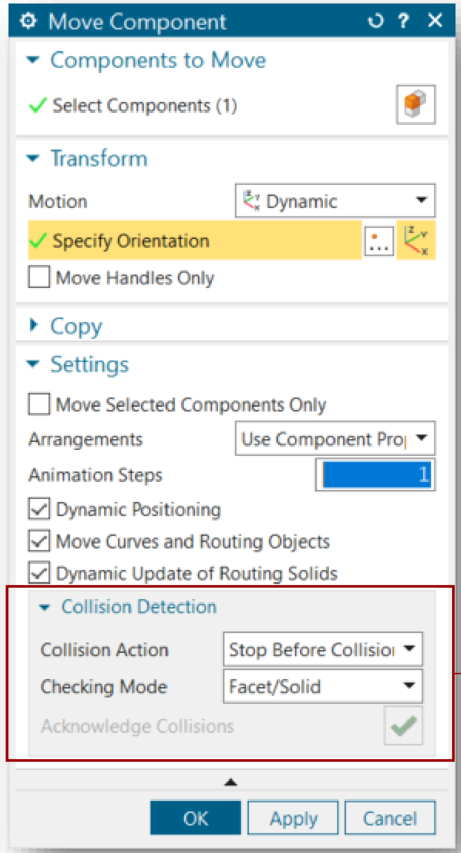
How it works in NX

In the „Move Component“ dialog is a section called „Collision Detection“. The action can be set to stops the movement at a collision.

This is the basic setting for the buzz wire.



Move Component

Components to Move

✓ Select Components (1)

Transform

Motion: Dynamic

✓ Specify Orientation

☐ Move Handles Only

Copy

Settings

☐ Move Selected Components Only

Arrangements: Use Component Pro

Animation Steps: 1

☑ Dynamic Positioning

☑ Move Curves and Routing Objects

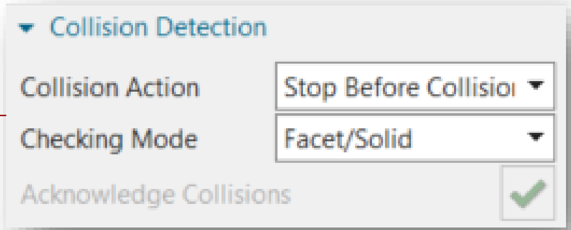
☑ Dynamic Update of Routing Solids

Collision Detection

Collision Action: Stop Before Collisio

Checking Mode: Facet/Solid

Acknowledge Collisions



Collision Detection

Collision Action: Stop Before Collisio

Checking Mode: Facet/Solid

Acknowledge Collisions

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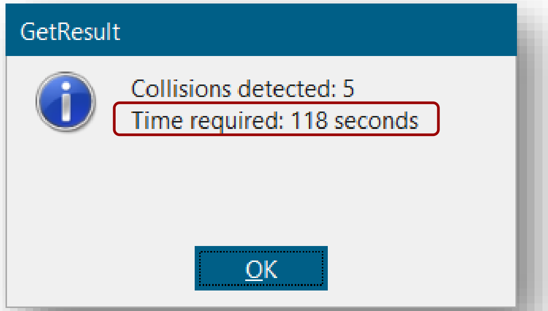
Duration

Time measurement

A start timestamp is set in a textfile when the move component is called. This is a so-called PRE-Action (SetTimestamp.vb). After confirm with ok a second timestamp (end) is set.

The time difference is the required duration.

Duration = TIMESTAMP_end – TIMESTAMP_start [seconds]

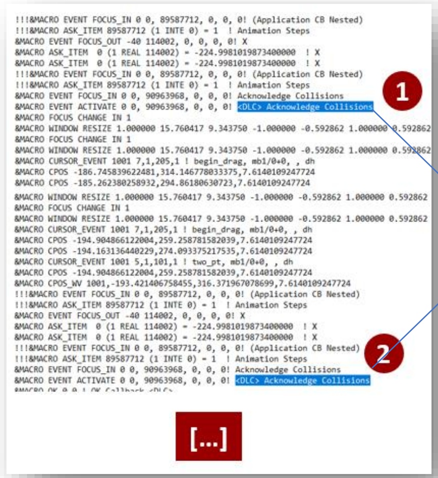

GetResult

Collisions detected: 5
Time required: 118 seconds

Collision

Collision

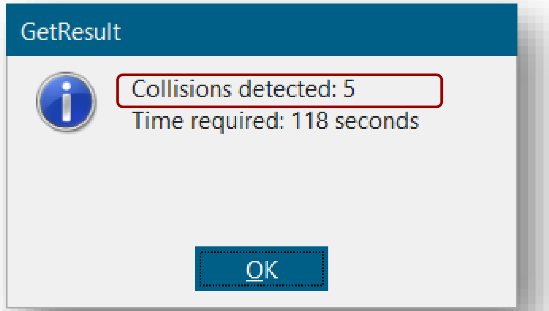
The original syslog file is copied (because you can not read out of the syslog in a running session). Everytime if the user confirm the collision this action is logged and can be written out by a so-called POST-Action (GetResult.vb) after the game is confirmed with „OK“ in the move component dialog.



```
!!!&MACRO EVENT FOCUS_IN 0 0, 89587712, 0, 0, 0! (Application CB Nested)
!!!&MACRO ASK_ITEM 89587712 (1 INTE 0) = 1  ! Animation Steps
&MACRO EVENT FOCUS_OUT -40 114002, 0, 0, 0, 0! X
&MACRO ASK_ITEM  0 (1 REAL 114002) = -224.9981019873400000  ! X
&MACRO ASK_ITEM  0 (1 REAL 114002) = -224.9981019873400000  ! X
!!!&MACRO EVENT FOCUS_IN 0 0, 89587712, 0, 0, 0! (Application CB Nested)
!!!&MACRO ASK_ITEM 89587712 (1 INTE 0) = 1  ! Animation Steps
&MACRO EVENT FOCUS_IN 0 0, 90963968, 0, 0, 0! Acknowledge Collisions
&MACRO EVENT ACTIVATE 0 0, 90963968, 0, 0, 0! <DLC> Acknowledge Collisions
&MACRO FOCUS CHANGE IN 1
&MACRO WINDOW RESIZE 1.000000 15.760417 9.343750 -1.000000 -0.592862 1.000000 0.592862
&MACRO FOCUS CHANGE IN 1
&MACRO WINDOW RESIZE 1.000000 15.760417 9.343750 -1.000000 -0.592862 1.000000 0.592862
&MACRO CURSOR_EVENT 1001 7,1,205,1 ! begin_drag, mb1/0+0, , dh
&MACRO CPOS -186.745839622481,314.146778033375,7.6140109247724
&MACRO CPOS -185.262380258932,294.86180630723,7.6140109247724
&MACRO WINDOW RESIZE 1.000000 15.760417 9.343750 -1.000000 -0.592862 1.000000 0.592862
&MACRO FOCUS CHANGE IN 1
&MACRO WINDOW RESIZE 1.000000 15.760417 9.343750 -1.000000 -0.592862 1.000000 0.592862
&MACRO CURSOR_EVENT 1001 7,1,205,1 ! begin_drag, mb1/0+0, , dh
&MACRO CPOS -194.904866122004,259.258781582039,7.6140109247724
&MACRO CPOS -194.163136440229,274.093375217535,7.6140109247724
&MACRO CURSOR_EVENT 1001 5,1,101,1 ! two_pt, mb1/0+0, , dh
&MACRO CPOS -194.904866122004,259.258781582039,7.6140109247724
&MACRO CPOS_WV 1001,-193.421406758455,316.371967078699,7.6140109247724
!!!&MACRO EVENT FOCUS_IN 0 0, 89587712, 0, 0, 0! (Application CB Nested)
!!!&MACRO ASK_ITEM 89587712 (1 INTE 0) = 1  ! Animation Steps
&MACRO EVENT FOCUS_OUT -40 114002, 0, 0, 0, 0! X
&MACRO ASK_ITEM  0 (1 REAL 114002) = -224.9981019873400000  ! X
&MACRO ASK_ITEM  0 (1 REAL 114002) = -224.9981019873400000  ! X
!!!&MACRO EVENT FOCUS_IN 0 0, 89587712, 0, 0, 0! (Application CB Nested)
!!!&MACRO ASK_ITEM 89587712 (1 INTE 0) = 1  ! Animation Steps
&MACRO EVENT FOCUS_IN 0 0, 90963968, 0, 0, 0! Acknowledge Collisions
&MACRO EVENT ACTIVATE 0 0, 90963968, 0, 0, 0! <DLC> Acknowledge Collisions
&MACRO OK 0 0 ! OK Callback <DLC>
```

Syslog extract - logged collision:

"<DLC> Acknowledge Collisions"



Collisions detected: 5
Time required: 118 seconds

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Program sequence – Relationships

PRE

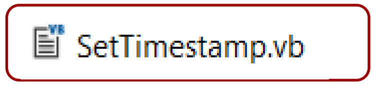
DURING

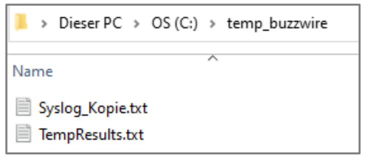
POST

Start „**Move Component**“ command

Move Component

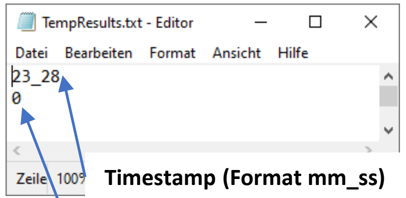
Once the function call has been initiated the „**SetTimestamp.vb**“ create a copy of the logfile.


SetTimestamp.vb


Dieser PC › OS (C:) › temp_buzzwire

Name
Syslog_Kopie.txt
TempResults.txt

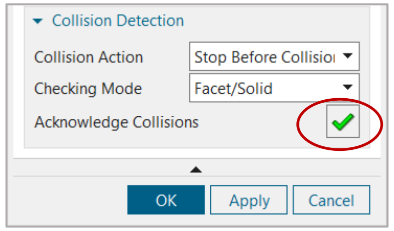
Additional the dll create a textfile with the current timestamp and the actual count of collision as content:


TempResults.txt - Editor

```
23_28
0
```

Acknowledge Collision

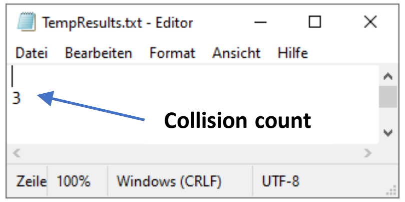
After every collision you have to conform with „ Acknowledge Collision“.


Collision Detection

Collision Action: Stop Before Collisioı
Checking Mode: Facet/Solid
Acknowledge Collisions: ✓

This information is logged in the copied logfile.

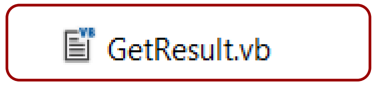
```
&MACRO ASK_ITEM  0 (1 REAL 114002) = 229.484649636560000  ! X
&MACRO ASK_ITEM  0 (1 REAL 114002) = 229.484649636560000  ! X
&MACRO EVENT FOCUS_IN 0 0, 90963968, 0, 0, 0! Acknowledge Collisions
&MACRO EVENT ACTIVATE 0 0, 90963968, 0, 0, 0! <DLC> Acknowledge Collisions
&MACRO OK 0 0 ! OK Callback <DLC>
```


TempResults.txt - Editor

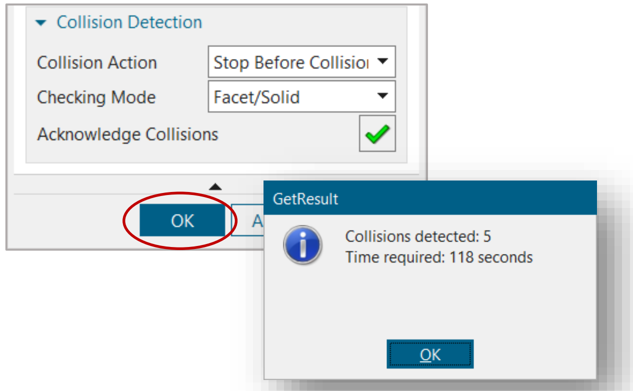
```

3
```

Datei Bearbeiten Format Ansicht Hilfe
Collision count
Zeile 100% Windows (CRLF) UTF-8

After „OK“ „**GetResult.vb**“


GetResult.vb

The collisions are temporary written in the textfiles (read out from logfile) and are counted.
The end timestamp is read out to get the required time as the difference from start and end point.
The result is displayed


Collision Detection

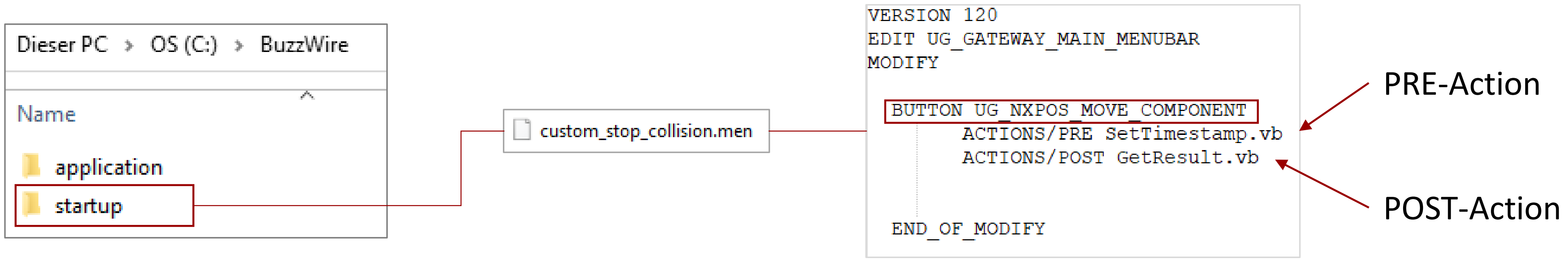
Collision Action: Stop Before Collisioı
Checking Mode: Facet/Solid
Acknowledge Collisions: ✓

GetResult

Collisions detected: 5
Time required: 118 seconds

*.men

- Add PRE / POST action to an application-specific menu item
- The **buzz wire** example shows how to customize the PRE / POST action that NX performs when the user chooses a command.
- In this example, when the user chooses the **Move Component** command either from the **selection of a component with the left (right) mouse button** menu or from the **Assemblies** ribbon tab, NX runs the **SetTimestamp.vb** file, and then the standard dialog box appears. After hit ok, NX runs the **GetResult.vb.**

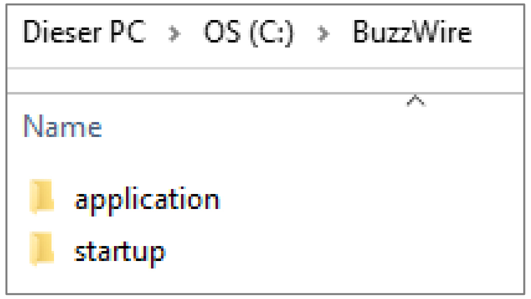


```
VERSION 120
EDIT UG_GATEWAY_MAIN_MENUBAR
MODIFY

  BUTTON UG_NXPOS_MOVE_COMPONENT
        ACTIONS/PRE SetTimestamp.vb
        ACTIONS/POST GetResult.vb


  END_OF_MODIFY
```

[PREPERATION]

Preperation

- Paste folder „BuzzWire“ on the C-Drive (for example)


Dieser PC > OS (C:) > BuzzWire

Name

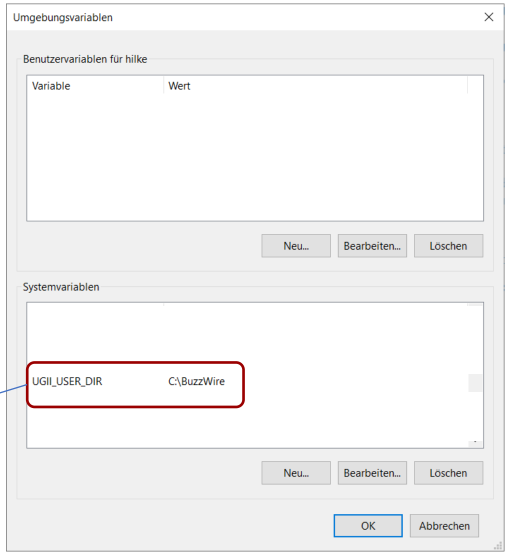
application

startup

Note:
*If the environment variable is set to the folder which contains a application and startup folder, NX read out the content automatically. (e.g. the *.men file)*

- Set the Windows environment variable to this folder (see next slide for details)
  - UGII_USER_DIR = C:\ BuzzWire

UGII_USER_DIR C:\BuzzWire


Umgebungsvariablen

Benutzervariablen für hilke

Variable	Wert

Systemvariablen

UGII_USER_DIR	C:\BuzzWire

Environment variable windows

Windows 10

Search in the search, and then select: System (Control Panel)

Click the Advanced system settings link.

Click Environment Variables. In the System Variables section click "New"

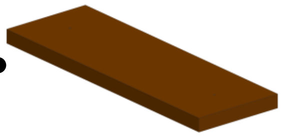
In the Edit System Variable (or New System Variable) window, specify the value for the UGII_USER_DIR environment variable (e.g. C:\ BuzzWire). Click "OK".

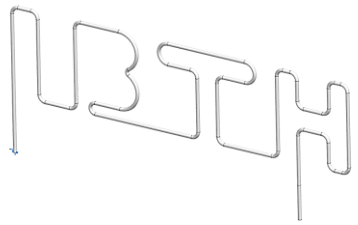
Close all remaining windows by clicking "OK".

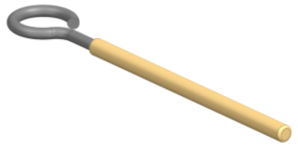
[PROVIDED FILES]

Content of Provided files

Parts.zip







BuzzWire.zip

- application
  - GetResult.vb
  - SetTimestamp.vb
- startup
  - custom_stop_collision.men

```
VERSION 120
EDIT UG_GATEWAY_MAIN_MENUBAR
MODIFY

  BUTTON UG_NXPOS_MOVE_COMPONENT
        ACTIONS/PRE SetTimestamp.dll
        ACTIONS/POST GetResult.dll


  END_OF_MODIFY
```

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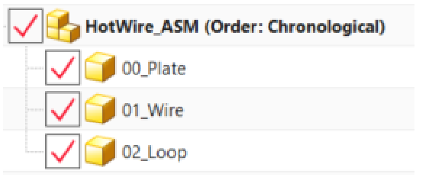
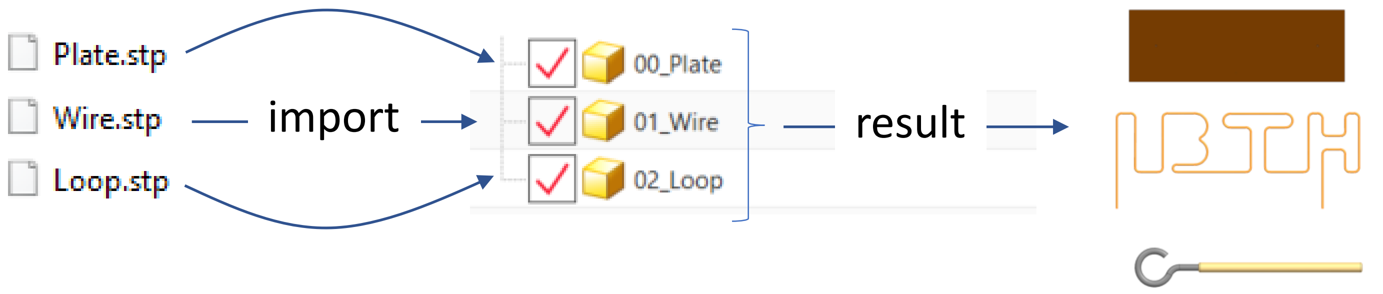
Create the „Buzz Wire“

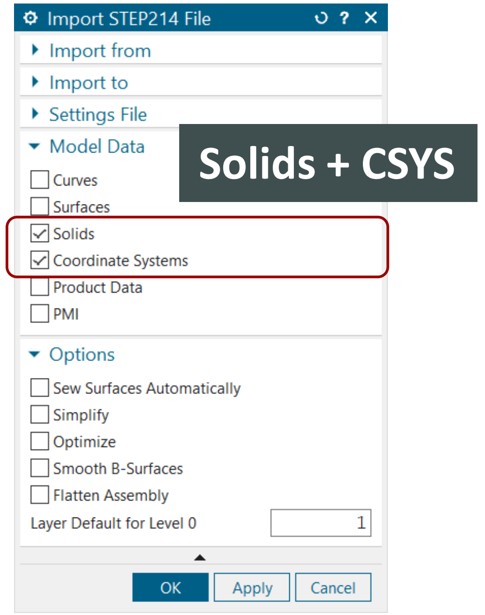
- Create a Assembly structure



HotWire_ASM (Order: Chronological)
- 00_Plate
- 01_Wire
- 02_Loop

- Import the provided Step files to the corresponding components



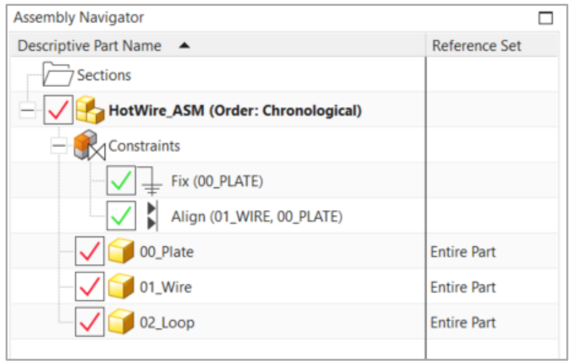


Import STEP214 File
- Import from
- Import to
- Settings File
- Model Data
  - [ ] Curves
  - [ ] Surfaces
  - [x] Solids
  - [x] Coordinate Systems
  - [ ] Product Data
  - [ ] PMI
- Options
  - [ ] Sew Surfaces Automatically
  - [ ] Simplify
  - [ ] Optimize
  - [ ] Smooth B-Surfaces
  - [ ] Flatten Assembly
  - Layer Default for Level 0: 1

OK Apply Cancel

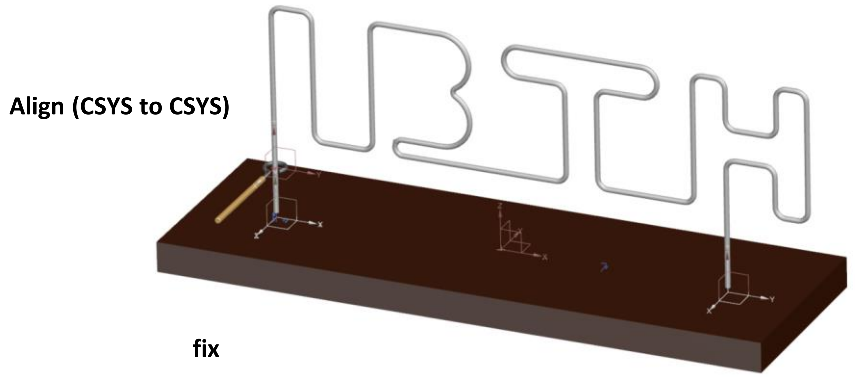
Solids + CSYS

- Use Assembly constraints for positioning



Assembly Navigator

Descriptive Part Name	Reference Set
Sections	
HotWire_ASM (Order: Chronological)	
Constraints	
Fix (00_PLATE)	
Align (01_WIRE, 00_PLATE)	
00_Plate	Entire Part
01_Wire	Entire Part
02_Loop	Entire Part



Tipp:
You can replace the Reference Set to „Entire Part“ to use the CSYS for positioning

[THE GAME]

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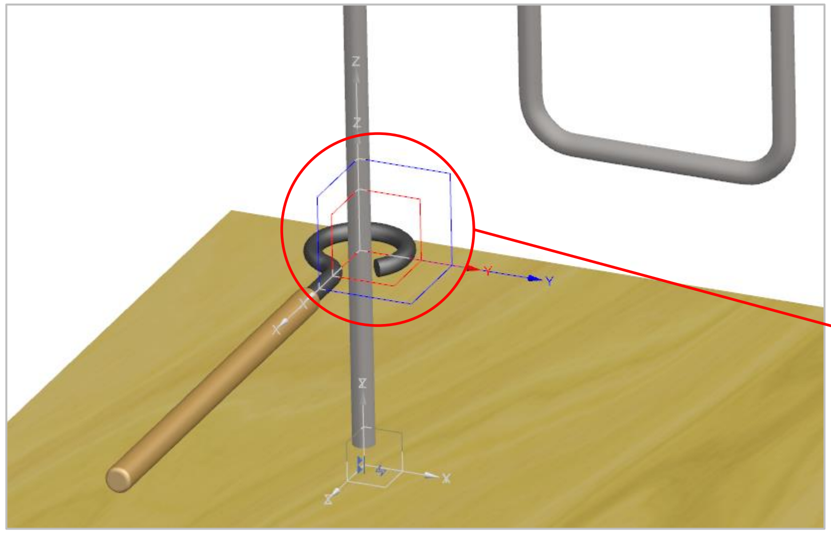
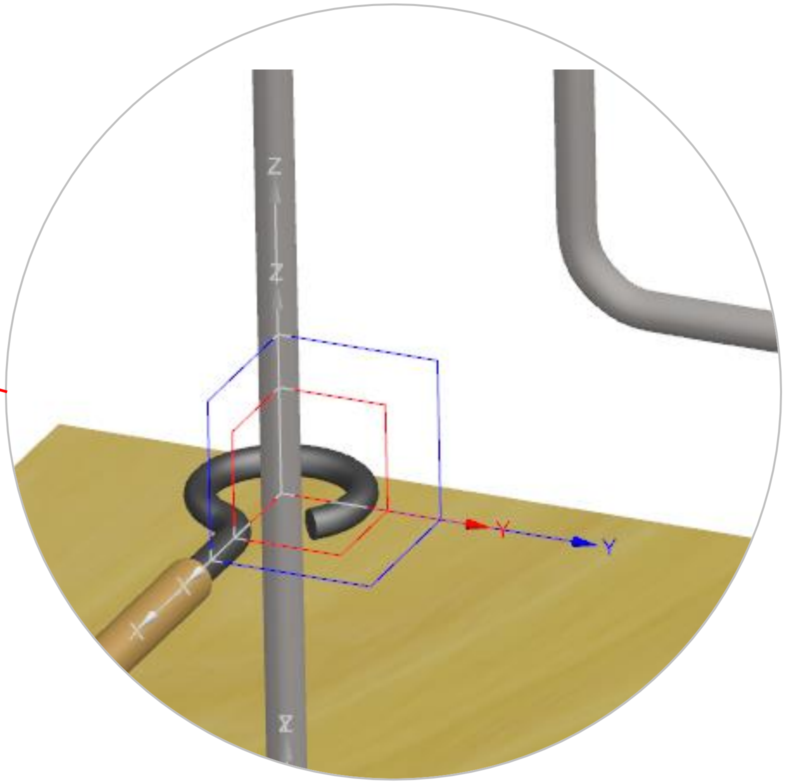
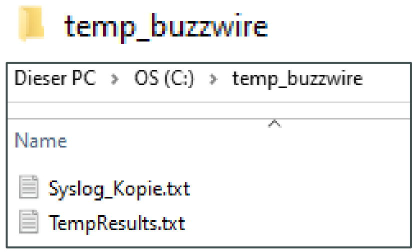
The beginning

- Start with the positioned loop component on the csys of the wire (for example blue = wire_csys, red = loop_csys; replace Ref.Set to entire part; Use assembly constraints (not associative) for positioning); set filter to CSYS

Note:
A folder is created on C-Drive if you start the move component command!!



temp_buzzwire

Dieser PC › OS (C:) › temp_buzzwire

Name

Syslog_Kopie.txt
TempResults.txt

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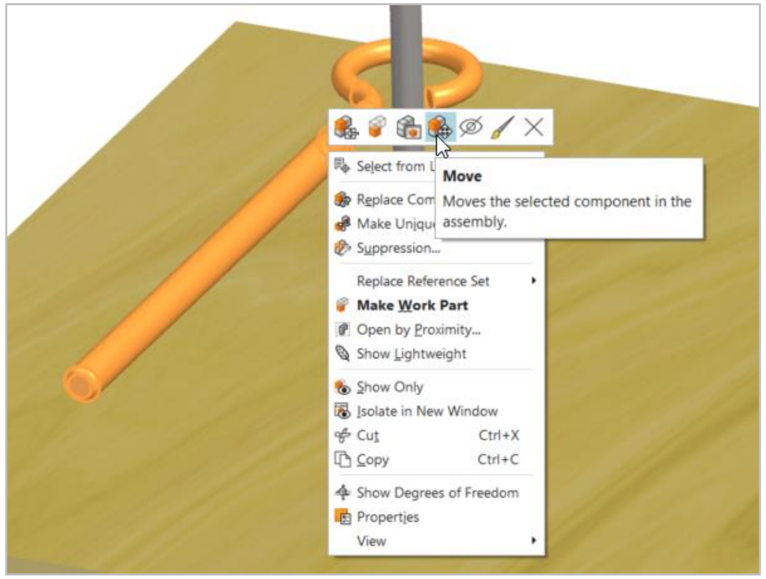
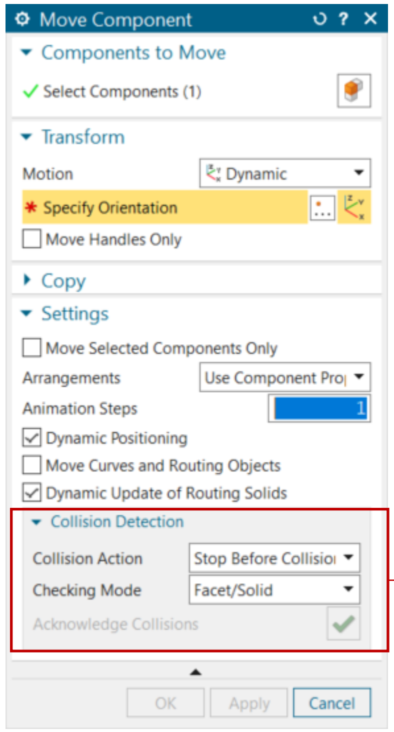
Movement

- Open „Move Component“ command (e.g. right (left) mouse button on component „Loop“ → Move) and set these options in the „Move Component“ dialog:



Move
Moves the selected component in the assembly.



Move Component

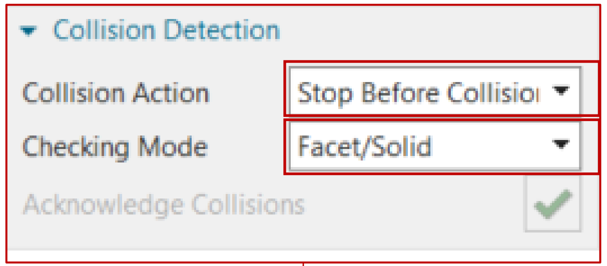
Components to Move
- ✓ Select Components (1)

Transform
- Motion: Dynamic
- * Specify Orientation
- ☐ Move Handles Only

Copy

Settings
- ☐ Move Selected Components Only
- Arrangements: Use Component Pro
- Animation Steps: 1
- ☑ Dynamic Positioning
- ☐ Move Curves and Routing Objects
- ☑ Dynamic Update of Routing Solids

Collision Detection
- Collision Action: Stop Before Collisio
- Checking Mode: Facet/Solid
- Acknowledge Collisions



Collision Detection
- Collision Action: Stop Before Collisio
- Checking Mode: Facet/Solid
- Acknowledge Collisions

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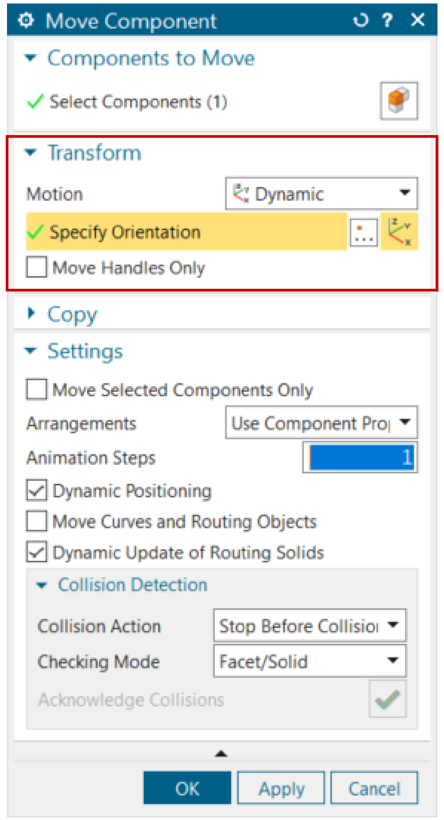
Movement – Translate/Rotate

- Use the handles to drag the loop around the wire



Move Component

Components to Move

✓ Select Components (1)

Transform

Motion	Dynamic
✓ Specify Orientation	
☐ Move Handles Only	

Copy

Settings

☐ Move Selected Components Only

Arrangements	Use Component Pro
Animation Steps	1

☑ Dynamic Positioning

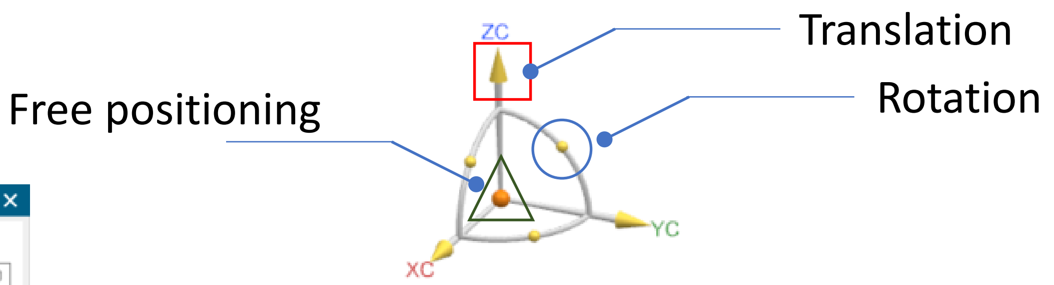
☐ Move Curves and Routing Objects

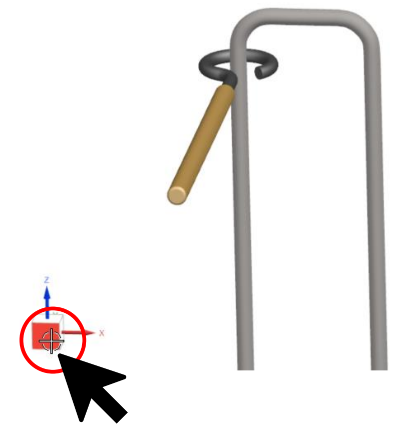
☑ Dynamic Update of Routing Solids

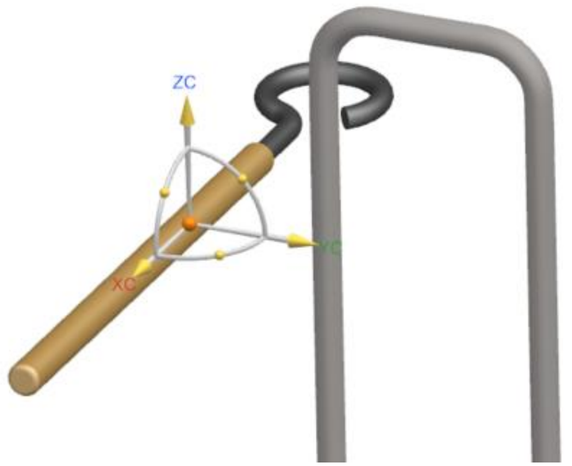
Collision Detection

Collision Action	Stop Before Collisio
Checking Mode	Facet/Solid
Acknowledge Collisions	✓

OK Apply Cancel

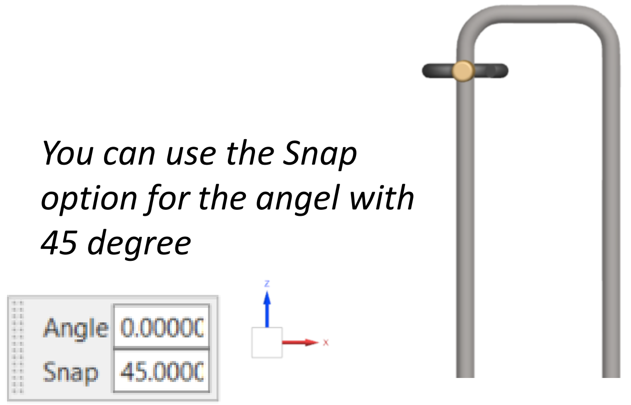






Tipp:
Use the triade for view orientation or try to use a space mouse.

You can use the Snap option for the angel with 45 degree



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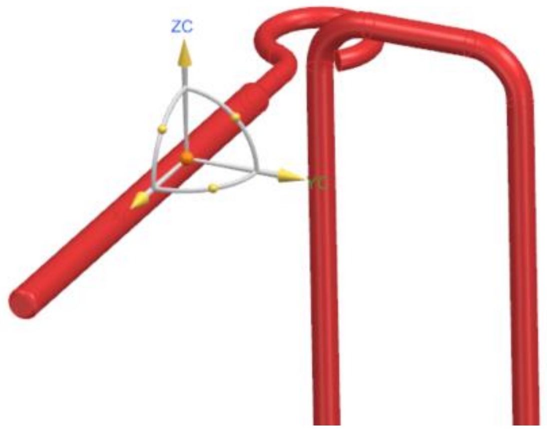
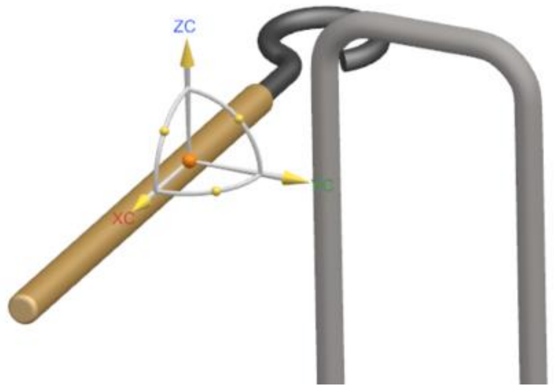
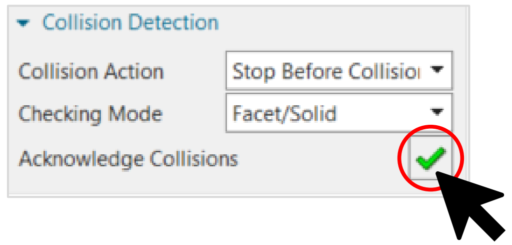
Collision detected

- If the loop component touch the wire the color of both components changed into red (default color)

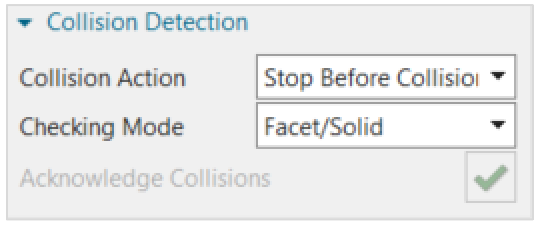






Collision Detection

Collision Action: Stop Before Collisio
Checking Mode: Facet/Solid
Acknowledge Collisions: ✓



Collision Detection

Collision Action: Stop Before Collisio
Checking Mode: Facet/Solid
Acknowledge Collisions: ✓

- Now you have to **acknowledge** the collision (green tick)!

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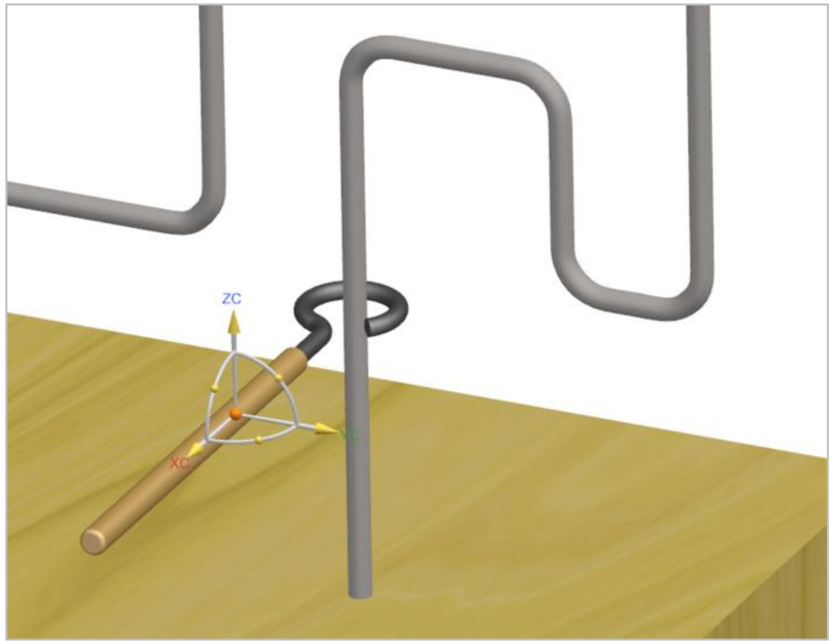
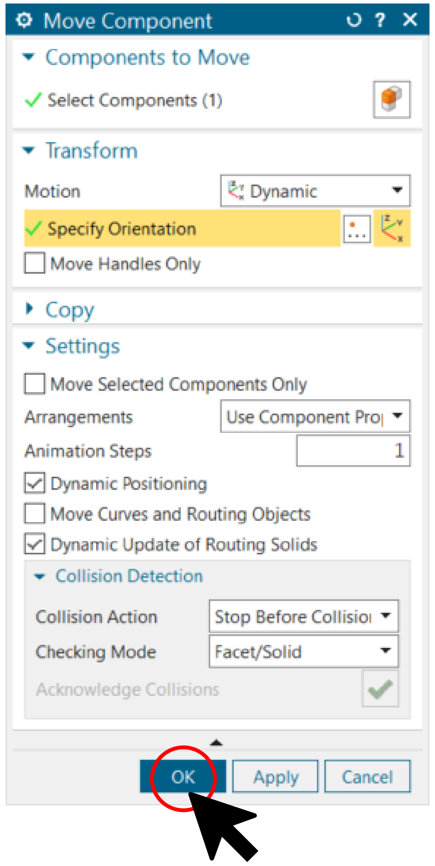
Finish

- Confirm with **OK** when you are finished




Move Component

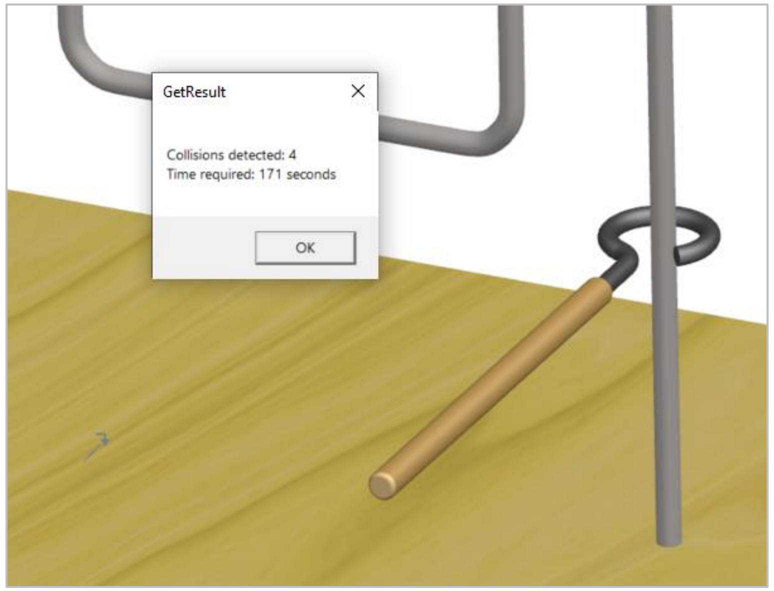
Components to Move
- ✓ Select Components (1)

Transform
- Motion: Dynamic
- ✓ Specify Orientation
- ☐ Move Handles Only

Copy

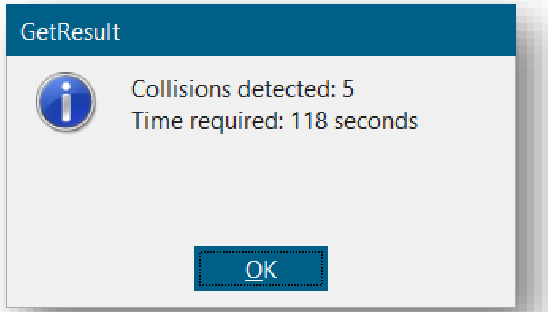
Settings
- ☐ Move Selected Components Only
- Arrangements: Use Component Pro
- Animation Steps: 1
- ☑ Dynamic Positioning
- ☐ Move Curves and Routing Objects
- ☑ Dynamic Update of Routing Solids

Collision Detection
- Collision Action: Stop Before Collisio
- Checking Mode: Facet/Solid
- Acknowledge Collisions


GetResult

Collisions detected: 4
Time required: 171 seconds

- The result window appears


GetResult

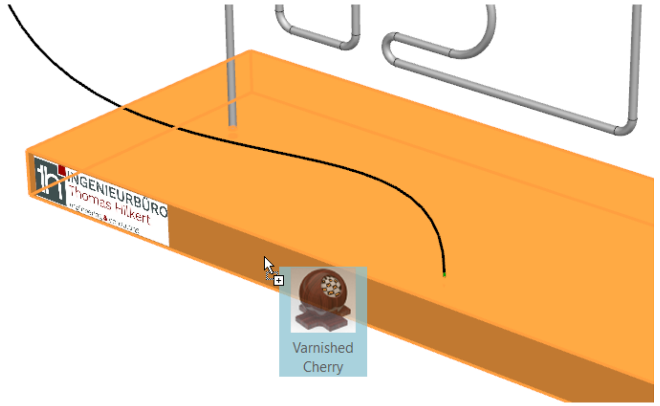
Collisions detected: 5
Time required: 118 seconds

Optional

- Create a cable using a Spline Mechanical

Route Spline

- Use Advanced Studio application to assign material color



Advanced Studio

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Contact details

Scan code…
… and get contact details