

Get Started

With SMARTOptics



Get started with SMARTOptics



This guide will help you to understand the basic functionality of SMARTOptics.

Click [here](#) to download the assembly for this guide.

Follow the instructions on the next pages

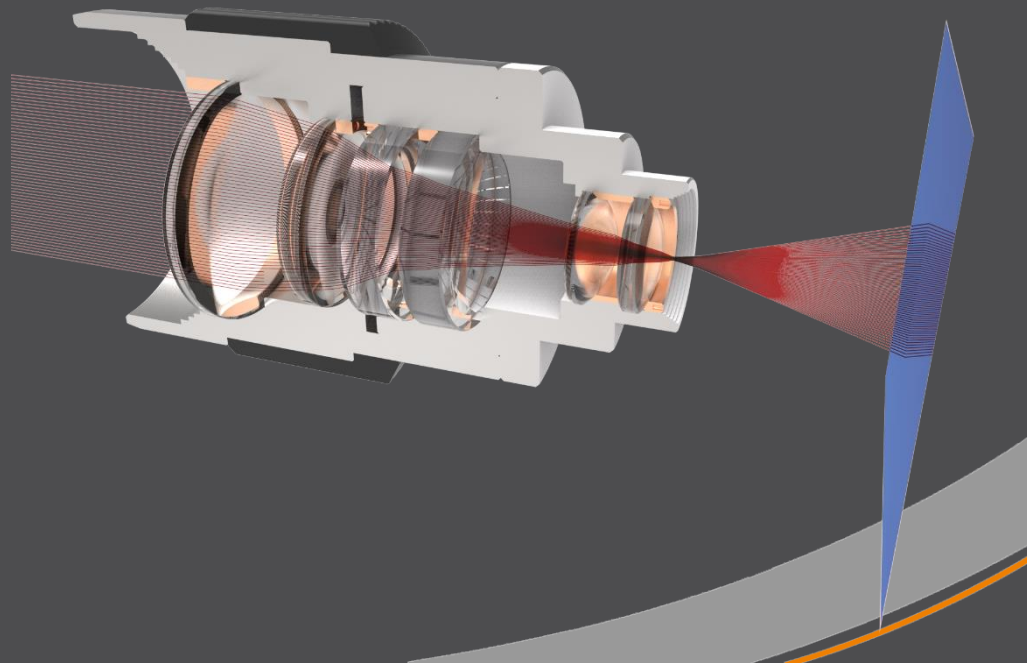
Requirements for this guide

- Creo Parametric License
- SMARTOptics License

Overview

In this guide you will learn the following skills

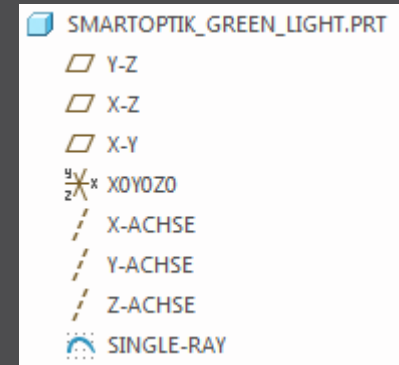
- Setup a light source
- Define your elements
 - Material
 - End
 - Absorb
 - Split
- View your results
- Output your results



Setup a light source

How to prepare your part as illuminant

- Simply add at least ONE sketched curve to your part
- Each curve in your illuminant is interpreted as one ray
- In the model tree on the right, you see a part with a “SINGLE-RAY”
- It is also possible to pattern the curve



Setup a light source

Exercise 1: Define a green illuminant

1. Open *smartoptics_get_started.asm*
2. Switch to the *SMARTOptics* tab
3. Select *Element Definition > Illuminant > Define*
4. Select *ILLUMINANT_GREEN.PRT*
5. The *Illuminant Definition* dialog opens
6. Enter *Name* and *Description* and select *Wavelength 'ne - Hg'* like shown in the image
7. Close the Dialog with *OK*
8. You are done!
Your first illuminant is defined

The screenshot shows the 'Illuminant Definition' dialog box with the following settings:

- ILLUMINANT_GREEN.prt** (Title bar)
- Name:** Green light source
- Description:** ne - Hg - 546.073
- Intensity:** 1.000000
- Direction:** Normal
- Wavelength:** ne - Hg, grün, 546.073
- Name:** ne - Hg
- Description:** grün
- Wavelength (nm):** 546.073000
- Default color:** grün
- Color:** grün, ≈ 560 - 490 nm
- Ray options:**
 - End rays (checked)
 - Endless rays (unchecked)
 - End points (checked)
 - Endless points (unchecked)
 - Absorb rays (checked)
 - Split rays (checked)
 - Absorb points (checked)
 - Split points (checked)
- Buttons:** OK, Cancel

Setup a light source

Exercise 2:

Repeat exercise 1 and define a red and a blue light source like shown in the image for the other two illuminant parts.

ILLUMINANT Definition

ILLUMINANT_RED.prt

Name
Red light source

Description
nC' - Cd - 643.85









Intensity
1.000000

Direction
Normal

Wavelength
nC' - Cd rot 643.85

Name: nC' - Cd
Description: rot
Wavelength (nm): 643.850000
Default color: rot

Color
rot ≈ 700 - 630 nm

	End rays		Endless rays
	End points		Endless points
	Absorb rays		Split rays
	Absorb points		Split points

OK Cancel

ILLUMINANT Definition

ILLUMINANT_BLUE.prt

Name
Blue light source

Description
nF - H - 486.134









Intensity
1.000000

Direction
Normal

Wavelength
nF - H blau 486.134

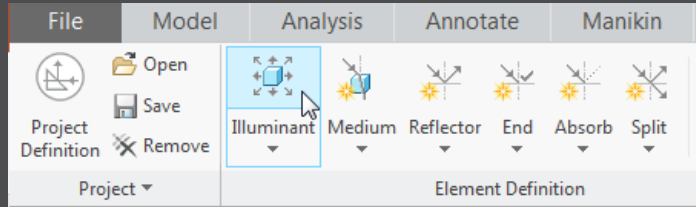
Name: nF - H
Description: blau
Wavelength (nm): 486.134000
Default color: blau

Color
blau ≈ 490 - 450 nm

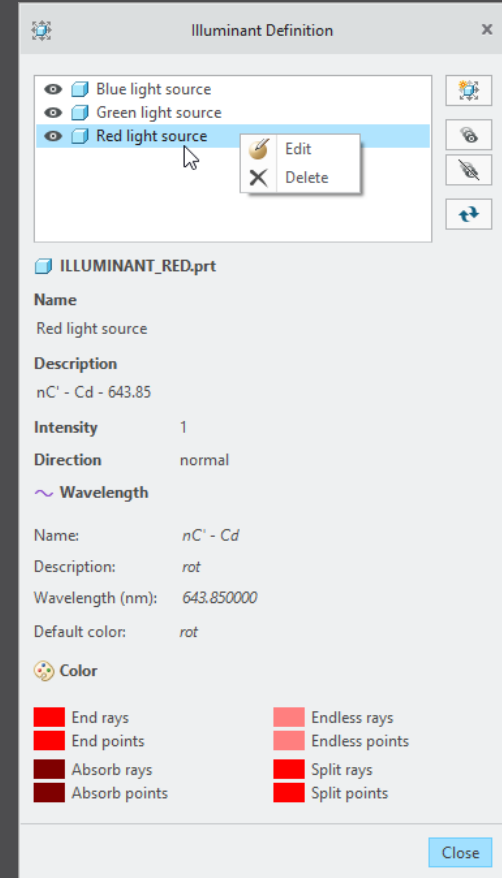
	End rays		Endless rays
	End points		Endless points
	Absorb rays		Split rays
	Absorb points		Split points

OK Cancel

Show all light sources



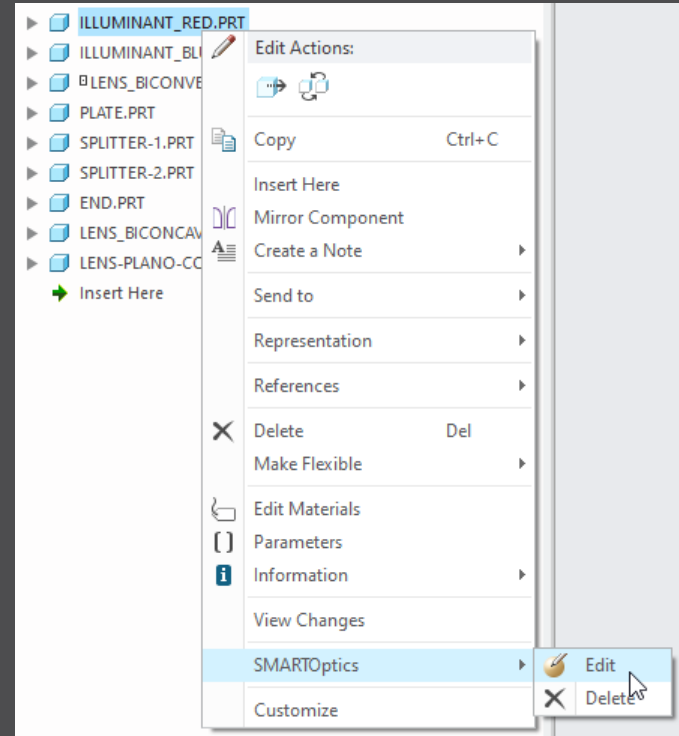
- Select *Element Definition* > *Illuminant* > *Show*
- The *Illuminant Definition* dialog with all information about your illuminants opens.
- In this dialog you have quick access to all your light sources.



Modify a light source

Exercise 3: Modify red illuminant

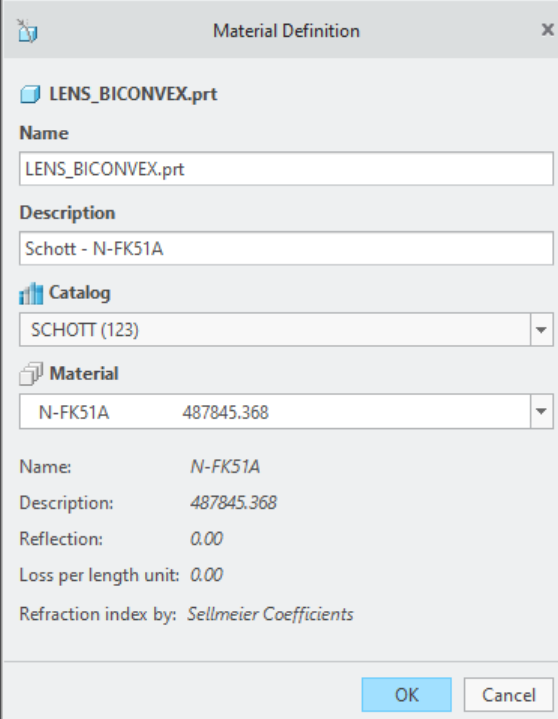
1. Right click on *ILLUMINANT_RED.PRT*
2. In the popup menu select *SMARTOptics > Edit*
3. The *Illuminant Definition* dialog opens
4. Change the *Direction* to *Normal*
5. Close the Dialog with *OK* to assign the changes.



Define your Elements - Material

Exercise 4: Define a material

1. Select *Element Definition > Material > Define*
2. Select the *LENS_BICONVEX.PRT*
3. The *Material Definition* dialog opens
4. You can enter a *Name* and a *Description* if you want
5. Select the Schott Material *N-FK51A* for this lens
6. Note: The refraction index for this material is defined in the database by Sellmeier Coefficients.



The image shows a 'Material Definition' dialog box with the following fields and options:

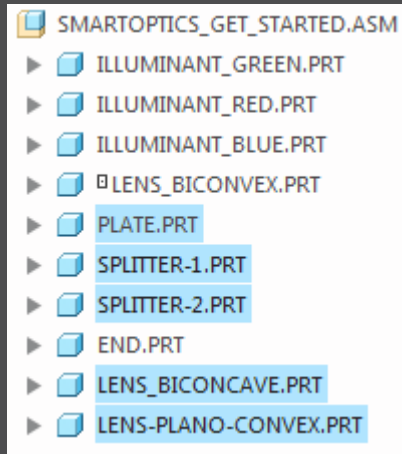
- File:** LENS_BICONVEX.prt
- Name:** LENS_BICONVEX.prt
- Description:** Schott - N-FK51A
- Catalog:** SCHOTT (123)
- Material:** N-FK51A 487845.368
- Name:** N-FK51A
- Description:** 487845.368
- Reflection:** 0.00
- Loss per length unit:** 0.00
- Refraction index by:** Sellmeier Coefficients

Buttons: OK, Cancel

Define your Elements - Material

Exercise 5: Define all materials

Repeat Exercise 4 for all highlighted parts



Description

Schott - N-FK51A

Catalog

SCHOTT (123)

Material

N-FK51A 487845.368

Name: N-FK51A

Description: 487845.368

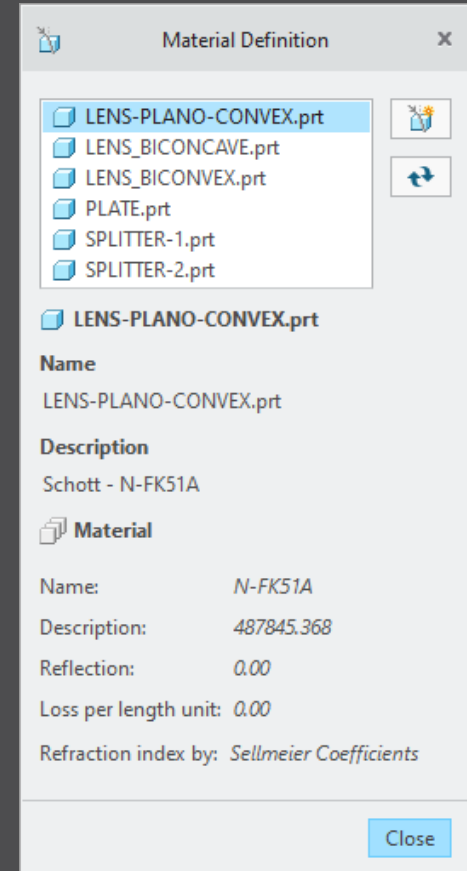
Reflection: 0.00

Loss per length unit: 0.00

Refraction index by: Sellmeier Coefficients

Show all Materials

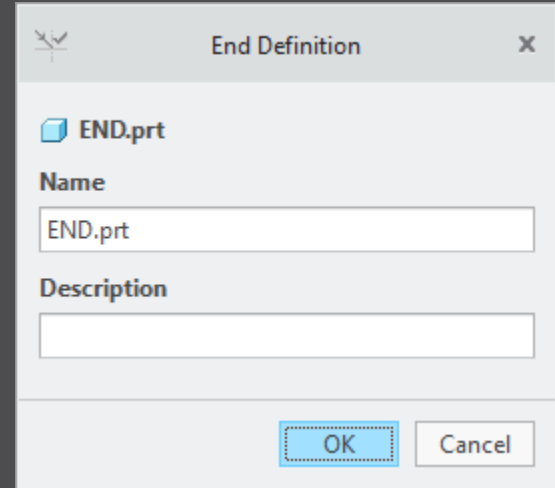
- Select *Element Definition > Material > Show*
- The *Material Definition* dialog with all information about your materials opens
- In this dialog you have quick access to all your materials



Define your Elements - End

Exercise 6: Define an End part

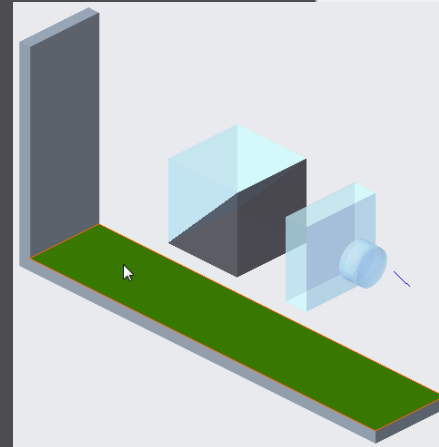
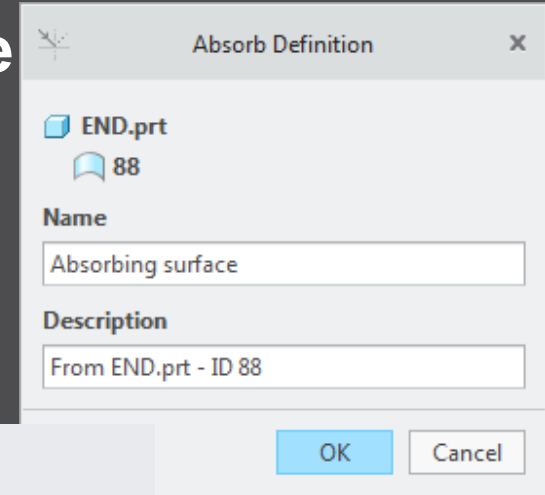
1. Select *Element Definition > End > Define*
2. Select the *END.PRT*
3. The *End Definition* dialog opens
4. You can enter a *Name* and a *Description* if you want



Define your Elements - Absorb

Exercise 7: Define an absorbing surface

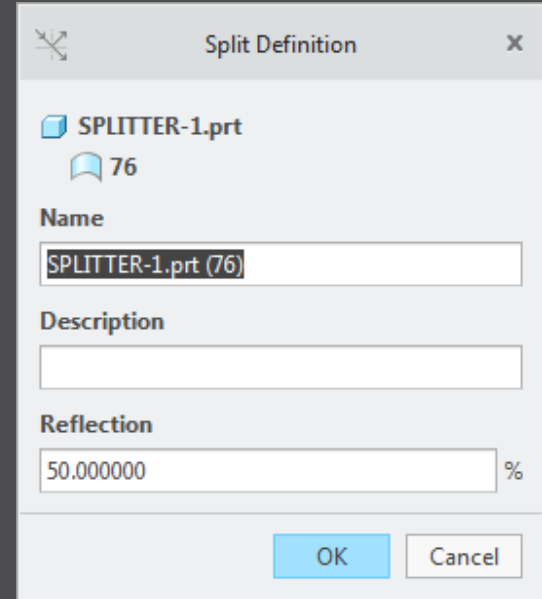
1. Select *Element Definition > Absorb > Define*
2. Select the surface shown in the image
3. The *Absorb Definition* dialog opens
4. You can enter a *Name* and a *Description* if you want



Define your Elements - Split

Exercise 8: Define two splitting surfaces

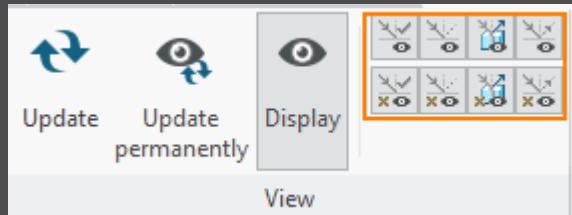
1. Select *Element Definition > Split > Define*
2. Select the connecting surface between both splitter parts.
3. The *Split Definition* dialog opens
4. You can enter a *Name* and a *Description* if you want
5. Repeat this step for the other connection surface



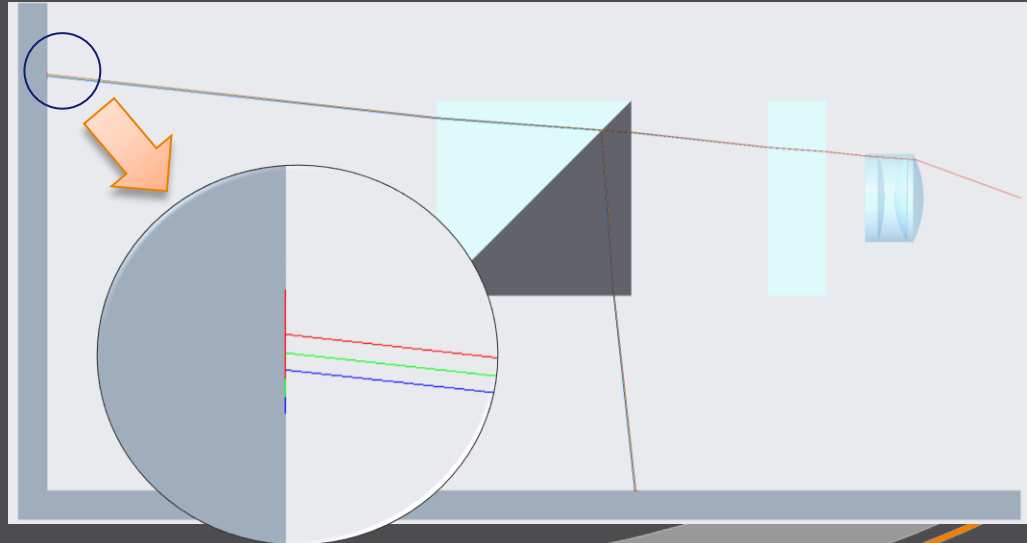
View your Results

Exercise 9: Show your results in Creo graphic window

1. Select *View > Update*
2. Select *View > Display*
3. Depending on the buttons state you can now see your results in Creo.



Note: Since we have defined 3 different wavelengths, the refraction is different for each ray.



The Ray-types

End rays

*Rays which ends on the element type **End***

Diffused rays

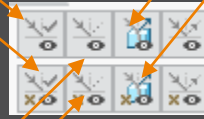
Rays which are splitted

Absorb rays

*Rays which ends on the element type **Absorb***

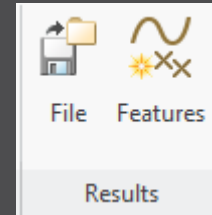
Endless rays

Rays with no end



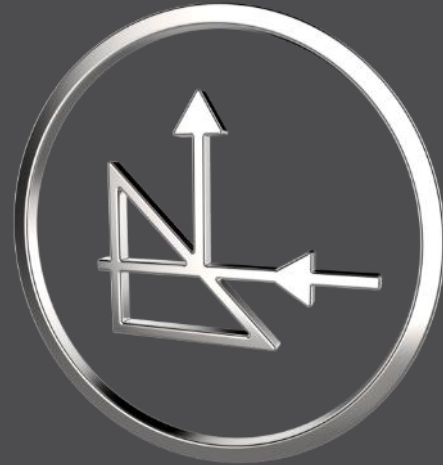
Output your Results

- What you see is what you get. Depending on your view button state, the result can be changed.
- You can output your results to *.ibl and *.pts file.
- You can output your results directly to the Creo model. Simply press a reference coordinate system and create your results.



Contact

If there are any problems, question or even concerns, do not hesitate to contact us.



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