# Address calculator

## Abstract

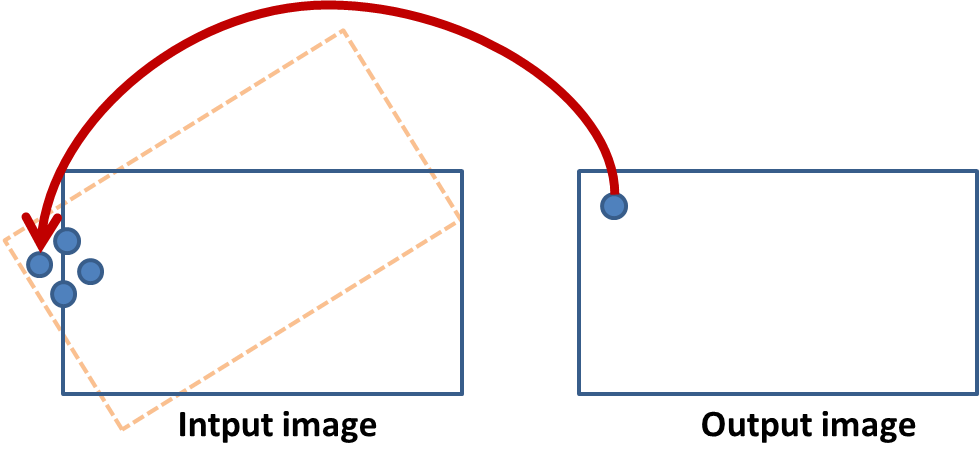
The unit calculates the source pixels address in matrix form a given current position (address, matrix form) in the output image.

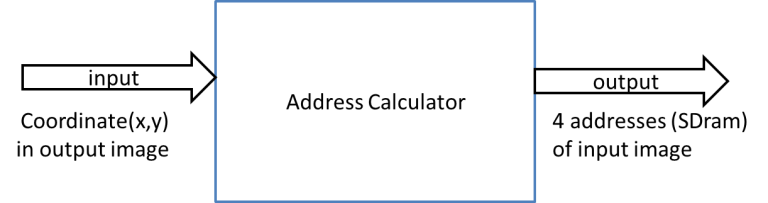
The output is addresses of 4 pixels that are required for the bilinear interpolation.

The input is address of 1 pixel of current position in output image.

**Note: X represents row indexes, Y represents column indexes.**

# Illustration

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## Inputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **description** | **type** | **size** | **Recived from** |
| Zoom factor | Holds the zoom factor | Std\_logic\_vector | 4 bit | Param\_reg |
| Sin\_teta | Holds sin(teta) | Floating point | TBD | TBD |
| Cos\_teta | Holds cos(teta) | Floating point | TBD | TBD |
| Row\_idx\_in | Holds the current row index of the output image | Std\_logic\_vector | 10 bit | Param\_reg |
| col\_idx\_in | Holds the current column index of the output image | Std\_logic\_vector | 10 bit | Param\_reg |
| X\_start | Holds the row index of the top left pixel for crop | Std\_logic\_vector | 10 bit | Param\_reg |
| Y\_start | Holds the column index of the top left pixel for crop | Std\_logic\_vector | 10 bit | Param\_reg |
| X\_size\_in | Holds the number of rows in the input image | generic | 10 bit | Img\_man\_top (Mds\_top\_block) |
| Y\_size\_in | Holds the number of columns in the input image | generic | 10 bit | Img\_man\_top (Mds\_top\_block) |
| X\_size\_out | Holds the number of rows in the output image | generic | 10 bit | Img\_man\_top (Mds\_top\_block) |
| Y\_size\_out | Holds the number of columns in the output image | generic | 10 bit | Img\_man\_top (Mds\_top\_block) |

## Outputs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **description** | **type** | **size** | **Destination** |
| TL\_x\_out | Holds the top left row index in input image | Std\_logic\_vector | 10 | Address converter |
| TL\_y\_out | Holds the top left column index in input image | Std\_logic\_vector | 10 | Address converter |
| TR\_x\_out | Holds the top right row index in input image | Std\_logic\_vector | 10 | Address converter |
| TR\_y\_out | Holds the top right column index in input image | Std\_logic\_vector | 10 | Address converter |
| BL\_x\_out | Holds the bottom left row index in input image | Std\_logic\_vector | 10 | Address converter |
| BL\_y\_out | Holds the bottom left column index in input image | Std\_logic\_vector | 10 | Address converter |
| BR\_x\_out | Holds the bottom right row index in input image | Std\_logic\_vector | 10 | Address converter |
| BR\_y\_out | Holds the bootom right column index in input image | Std\_logic\_vector | 10 | Address converter |
|  |  |  |  |  |
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