

Configuration of warping parameters

The configuration information passed to the warping library is used to check constraints and as basis for computations.

Overall configuration parameter structure

The following table details the overall configuration parameter structure and their limits.

Name	Range	Description	Example Value
NumBitsPerParam	1..16	Number of bits used for each parameter (bit length of each parameter, contains pixel fractions)	12
PixResolution	0: $\frac{1}{16}$ px 1: $\frac{1}{8}$ px 2: $\frac{1}{4}$ px 3: $\frac{1}{2}$ px 4: 1 px 5: 2 px 6: 4 px 7: 8 px	Resolution of warping parameters.	0 ($\frac{1}{16}$ px)
DisplaySizeX	0..65535	Display size in horizontal direction (in pixel).	480
DisplaySizeY	0..65535	Display size in vertical direction (in pixel).	240
BitmapAreaX	0..65535	Number of Bitmap-pixels in horizontal direction. Reference points are equally distributed over this range in x-direction. Condition: $\text{BitmapAreaX} \leq \text{DisplaySizeX}$	480
BitmapAreaY	0..65535	Number of Bitmap-pixels in vertical direction. Reference points are equally distributed over this range in y-direction. Condition: $\text{BitmapAreaY} \leq \text{DisplaySizeY}$	240

BitmapAreaShiftX	0..65535	Shift of the bitmap area center point in horizontal direction. Condition: (BitmapAreaX/2+BitmapAreaShiftX≤DisplaySizeX) AND (BitmapAreaX/2- BitmapAreaShiftX ≥0)	240
BitmapAreaShiftY	0..65535	Shift of the bitmap area center point in vertical direction. Condition: (BitmapAreaY/2+BitmapAreaShiftY≤DisplaySizeY) AND (BitmapAreaY/2- BitmapAreaShiftY ≥0)	120
IlluminatedDisplayAreaX	0..65535	Number of illuminated pixels in horizontal direction Condition: IlluminatedDisplayAreaX ≤DisplaySizeY	480
IlluminatedDisplayAreaY	0..65535	Number of illuminated pixels in vertical direction Condition: IlluminatedDisplayAreaY ≤DisplaySizeY	220
IlluminatedDisplayAreaShiftX	0..65535	Shift of the illuminated display area center point in horizontal direction. Condition: (IIIDisplayAreaX/2+IIIDisplayAreaShiftX≤DisplaySizeX) AND (IIIDisplayAreaX/2- IIIDisplayAreaShiftX ≥0)	480
IlluminatedDisplayAreaShiftY	0..65535	Shift of the illuminated display area center point in vertical direction. Condition: (IIIDisplayAreaY/2+IIIDisplayAreaShiftY≤DisplaySizeY) AND (IIIDisplayAreaY/2- IIIDisplayAreaShiftY ≥0)	220
WarpingAreaX	0..65535	Number of pixels used for warping in horizontal direction. Condition: WarpingAreaX≤IlluminatedDisplayAreaX This parameter is present for historical reasons and is not used during computation/adjustment. Its validity is still checked, though.	470

WarpingAreaY	0..65535	Number of pixels used for warping in vertical direction. Condition: $\text{WarpingAreaY} \leq \text{IlluminatedDisplayAreaY}$ This parameter is present for historical reasons and is not used during computation/adjustment. Its validity is still checked, though.	120
WarpedAreaShiftX	0..65535	Shift of the warped area center point in horizontal direction. This parameter is present for historical reasons and is not used during computation/adjustment. Its validity is still checked, though.	220
WarpedAreaShiftY	0..65535	Shift of the warped area center point in vertical direction. This parameter is present for historical reasons and is not used during computation/adjustment. Its validity is still checked, though.	110
RotationValue	-18000 .. +18000	Rotation value in grad * 100	-150 // rotate 1.5°
ParamSet	Data	Set of reference point shift vectors row-major ordered(left to right, top to bottom). Each reference point in x/y direction is represented as a signed integer value in range -32,768 .. 32,767 (2 bytes).	(X0, Y0) (X0, Y1) ... (XM, YN) M: #RefPointsX N: #RefPointsY
ParamSetLength	0..65535	Length of parameter set in bytes calculated using the following formula: $2 * \text{NumRefPointsX} * \text{NumRefPointsY} * \text{NumBitsPerParam} / 8$	825 // 2*25*11*12/8
RotationLimit	0..180	Maximal rotation angle in grad (+/- value)	5 // +/- 5°
TrapezoidLimitX	0..65535	Maximum value for trapezoid transformation in horizontal direction (+/- value)	50
TrapezoidLimitY	0..65535	Maximum value for trapezoid transformation in vertical direction (+/- value)	50

ParallelogramLimitX	0..65553 5	Maximum value for parallelogram transformation in horizontal direction (+/- value)	50
ParallelogramLimitY	0..65553 5	Maximum value for parallelogram transformation in vertical direction (+/- value)	50
PinbalanceLimitX	0..65553 5	Maximum value for pin balance transformation in horizontal direction (+/- value)	50
PinbalanceLimitY	0..65553 5	Maximum value for pin balance transformation in vertical direction (+/- value)	50
PincushionLimitX	0..65553 5	Maximum value for pincushion transformation in horizontal direction (+/- value)	50
PincushionLimitY	0..65553 5	Maximum value for pincushion transformation in vertical direction (+/- value)	50
WidthLimit	0..65553 5	Maximum value for width transformation in horizontal direction (+/- value)	50
HeightLimit	0..65553 5	Maximum value for height transformation in vertical direction (+/- value)	50
ScaleMode	0 or 1	0 - scale factor is 1. Scaling might occur if image does not fit inside illuminated area 1 - scale factor is calculated based on RotationLimit value, such that, when rotated at maximum, the image will fit inside illuminated area	0

Please refer to the following chapters for details on how the parameters influence the result of the warped image.

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