PHASEONE
INDUSTRIAL

Date:Sep 06, 2016

Camera Calibration Certificate

Camera Name	**Phase One IXU-RS-1000 NIR**
Back Serial Number	YD010000
Sensor Resolution	11608 x 8708 (100 MP) (X Axis; Y Axis)
Pixel Size	4.6 µm
Lens Type & Focal Length	50 MM
Lens Serial Number	12332625
Distance Setting	Infinity [m]
Date Of Calibration	06-Sep-16

Calibration Lab – Phase One.
5 Atir Yeda st,
Kfar Saba , ISRAEL

Signed by – Aharon Shoval



YD010000 – 50 MM

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Calibration results

(Australis Format)

PARAMETER	VALUE	STD Deviation
FOCAL LENGTH	51.8601 (mm)	0.0018 (mm)
PRINCIPAL POINT OFFSET		
XP	-0.1023 (mm)	0.0005 (mm)
YP	-0.0196 (mm)	0.0005 (mm)
RADIAL DISRORTION		
K1	1.53443e-005	4.89964e-008
K2	-4.75073e-009	1.04521e-010
K3	5.05982e-013	6.90993e-014
RADIAL-ASYMMETRIC AND TANGENTIAL DISTORTION		
P1	-3.35658e-006	6.51958e-008
P2	3.89012e-006	5.44056e-008
AFFINITY AND NON-ORTHOGONALITY		
B1	6.84115e-005	2.32131e-006
B2	-5.71813e-006	2.41725e-006

Calibration pictures exported using Capture One version 9
Lens distortion correction parameter used in exporting raw Tiffs – 0% correction.

The coefficients follow the model used by the photogrammetric software Australis where the corrected image coordinates (x_{corr}, y_{corr}) can be calculated from the measured coordinates (x_{meas}, y_{meas}) by using the following formulas:

$$x = x_{meas} - x_p$$

$$y = y_{meas} - y_p$$

$r^2 = x^2 + y^2$ Where x and y are now with respect to the principal point.

$$dr = K1 * r^3 + K2 * r^5 + K3 * r^7$$

$$x_{corr} = x + x * {}^{dr}/_{r} + P1 * (r^2 + 2 * x^2) + 2 * P2 * x * y + B1 * x + B2 * y$$

$$y_{corr} = y + y * {}^{dr}/_{r} + P2 * (r^2 + 2 * y^2) + 2 * P1 * x * y$$

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Calibration results

(USGS format)

Camera	iXU1000-RS_(50_mm)
Width	11608
Height	8708
PW	0.0046
PH	0.0046
F	51.8599
XP	-0.10229
YP	-0.0196327
K0	0
K1	1.57133e-005
K2	-6.07328e-009
K3	2.47109e-012
K4	-9.77226e-016
P1	-3.2664e-006
P2	3.79342e-006
P3	4.11902e-005
P4	-9.4478e-009

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Calibration results

(INPHO format)

Camera	iXU1000-RS_(50_mm)
CCD_COLUMNS	11608
CCD_ROWS	8708
Pixel Width	0.0046
Pixel Height	0.0046
Focal length	51.8624
PIXEL_REFERENCE	Top Left
PPA X	5781.76
PPA Y	4358.26
K0	0
K1	-1.59333e-005
K2	6.88608e-009
K3	-3.42324e-012
K4	1.33102e-015
P1	3.3556e-006
P2	-3.88973e-006
P3	0
P4	0

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Radial Correction Lookup Table

Radial Distance (mm)	Correction (pixels)
0	0
1	0,003334685
2	0,026652705
3	0,089813648
4	0,212430161
5	0,413745869
6	0,712514949
7	1,12688393
8	1,674276261
9	2,371280204
10	3,233540613
11	4,275655139
12	5,511075435
13	6,952013897
14	8,609356505
15	10,49258232
16	12,60969018
17	14,96713318
18	17,56976142
19	20,42077368
20	23,52167847
21	26,87226512
22	30,47058531
23	34,31294581
24	38,39391271
25	42,70632802
26	47,24133886
27	51,98844008
28	56,93553065
29	62,06898451
30	67,37373638
31	72,8333831
32	78,43030104
33	84,14578011
34	89,96017502