 quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

Bundle Block Adjustment Details
(i)

| Number of 2D Keypoint Observations for Bundle Block Adjustment | 1856317 |
| :--- | :--- |
| Number of 3D Points for Bundle Block Adjustment | 485342 |
| Mean Reprojection Error [pixels] | 0.216 |

## Internal Camera Parameters

RedEdge_5.5_1280x960 (Blue). Sensor Dimensions: 4.800 [mm] x 3.600 [mm]
EXIF ID: RedEdge_5.5_1280x960

|  | Focal Length | Principal Point x | Principal Point y | R1 | R2 | R3 | T1 | T2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Initial Values | $\begin{aligned} & 1451.790 \text { [pixel] } \\ & 5.444 \text { [mm] } \end{aligned}$ | $\begin{aligned} & 642.904 \text { [pixel] } \\ & 2.411[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 482.213 \text { [pixel] } \\ & 1.808[\mathrm{~mm}] \end{aligned}$ | -0.107 | 0.219 | -0.202 | 0.001 | 0.000 |
| Optimized Values | 1452.118 [pixel] 5.445 [mm] | $\begin{aligned} & 643.189 \text { [pixel] } \\ & 2.412[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 479.883 \text { [pixel] } \\ & 1.800[\mathrm{~mm}] \end{aligned}$ | -0.096 | 0.150 | -0.041 | 0.000 | 0.001 |
| Uncertainties (Sigma) | $\begin{aligned} & 0.464 \text { [pixel] } \\ & 0.002[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 0.185 \text { [pixel] } \\ & 0.001 \text { [mm] } \end{aligned}$ | $\begin{aligned} & 0.146 \text { [pixel] } \\ & 0.001[\mathrm{~mm}] \end{aligned}$ | 0.001 | 0.009 | 0.020 | 0.000 | 0.000 |



The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to the see the average direction and magnitude of the reprojection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error.

Internal Camera Parameters

## RedEdge_5.5_1280x960 (Green). Sensor Dimensions: 4.800 [mm] x 3.600 [mm]

EXIF ID: RedEdge_5.5_1280x960

|  | Focal Length | Principal Point $x$ | Principal Point y | R1 | R2 | R3 | T1 | T2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Initial Values | $\begin{aligned} & 1449.327 \text { [pixel] } \\ & 5.435[\mathrm{~mm}] \end{aligned}$ | 649.120 [pixel] 2.434 [mm] | $\begin{aligned} & 467.053 \text { [pixel] } \\ & 1.751[\mathrm{~mm}] \end{aligned}$ | -0.109 | 0.221 | -0.207 | 0.000 | 0.000 |
| Optimized Values | $\begin{aligned} & 1449.646 \text { [pixel] } \\ & 5.436[\mathrm{~mm}] \end{aligned}$ | 649.419 [pixel] 2.435 [mm] | $\begin{aligned} & 464.757 \text { [pixel] } \\ & 1.743[\mathrm{~mm}] \end{aligned}$ | -0.099 | 0.159 | -0.060 | 0.000 | 0.001 |
| Uncertainties (Sigma) | $\begin{aligned} & 0.458 \text { [pixel] } \\ & 0.002[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 0.070 \text { [pixel] } \\ & 0.000[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 0.074 \text { [pixel] } \\ & 0.000[\mathrm{~mm}] \end{aligned}$ | 0.000 | 0.003 | 0.006 | 0.000 | 0.000 |



The correlation between camera internal parameters determined by the bundle adjustment. White indicates a full correlation between the parameters, ie. any change in one can be fully compensated by the other. Black indicates that the parameter is completely independent, and is not affected by other parameters.

The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to the see the average direction and magnitude of the reprojection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error

## Internal Camera Parameters

RedEdge_5.5_1280x960 (Red). Sensor Dimensions: 4.800 [mm] x 3.600 [mm]

EXIF ID: RedEdge_5.5_1280x960

|  | Focal Length | Principal Point $x$ | Principal Pointy | R1 | R2 | R3 | T1 | T2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Initial Values | $\begin{aligned} & 1453.504 \text { [pixel] } \\ & 5.451[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 646.632 \text { [pixel] } \\ & 2.425[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 479.307 \text { [pixel] } \\ & 1.797[\mathrm{~mm}] \end{aligned}$ | -0.106 | 0.201 | -0.161 | -0.000 | -0.000 |
| Optimized Values | $\begin{aligned} & 1453.838 \text { [pixel] } \\ & 5.452[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 646.790 \text { [pixel] } \\ & 2.425[\mathrm{~mm}] \end{aligned}$ | 477.550 [pixel] 1.791 [mm] | -0.096 | 0.128 | 0.016 | -0.000 | 0.000 |
| Uncertainties (Sigma) | $\begin{aligned} & 0.465 \text { [pixel] } \\ & 0.002[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 0.200 \text { [pixel] } \\ & 0.001[\mathrm{~mm}] \end{aligned}$ | 0.157 [pixel] <br> 0.001 [mm] | 0.001 | 0.010 | 0.021 | 0.000 | 0.000 |



The correlation between camera internal parameters determined by the bundle adjustment. White indicates a full correlation between the parameters, ie. any change in one can be fully compensated by the other. Black indicates that the parameter is completely independent, and is not affected by other parameters.


The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to the see the average direction and magnitude of the reprojection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error

Internal Camera Parameters

RedEdge_5.5_1280x960 (NIR). Sensor Dimensions: 4.800 [mm] x 3.600 [mm]
EXIF ID: RedEdge_5.5_1280x960
$\left.\begin{array}{|l|l|l|l|l|l|l|l|l|l|}\hline & \begin{array}{l}\text { Focal } \\ \text { Length }\end{array} & \begin{array}{l}\text { Principal } \\ \text { Point } \mathrm{x}\end{array} & \begin{array}{l}\text { Principal } \\ \text { Pointy }\end{array} & \text { R1 } & \text { R2 } & \text { R3 } & \text { T1 } & \text { T2 } \\ \hline \text { Initial Values } & \begin{array}{l}1462.287[\text { pixel }]\end{array} & \begin{array}{l}630.211[\text { pixel }] \\ 5.363[\mathrm{~mm}]\end{array} & \begin{array}{l}485.755[\text { pixel }] \\ 1.822[\mathrm{~mm}]\end{array} & -0.112 & 0.205 & -0.153 & 0.000 & 0.000 \\ \hline & 5.484[\mathrm{~mm}]\end{array}\right)$


The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to the see the average direction and magnitude of the reprojection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error.

Internal Camera Parameters

目 RedEdge_5.5_1280x960 (Red edge). Sensor Dimensions: $4.800[\mathrm{~mm}] \times 3.600[\mathrm{~mm}]$
EXIF ID: RedEdge_5.5_1280x960

|  | Focal Length | Principal Point $x$ | Principal Point y | R1 | R2 | R3 | T1 | T2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Initial Values | $\begin{aligned} & 1453.628 \text { [pixel] } \\ & 5.451[\mathrm{~mm}] \end{aligned}$ | 641.861 [pixel] 2.407 [mm] | $\begin{aligned} & 484.656 \text { [pixel] } \\ & 1.817[\mathrm{~mm}] \end{aligned}$ | -0.109 | 0.199 | -0.151 | -0.000 | -0.000 |
| Optimized Values | 1454.016 [pixel] 5.453 [mm] | $\begin{aligned} & 641.981 \text { [pixel] } \\ & 2.407[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 483.083 \text { [pixel] } \\ & 1.812[\mathrm{~mm}] \end{aligned}$ | -0.101 | 0.140 | -0.010 | -0.001 | 0.000 |
| Uncertainties (Sigma) | $\begin{aligned} & 0.465 \text { [pixel] } \\ & 0.002[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 0.208 \text { [pixel] } \\ & 0.001[\mathrm{~mm}] \end{aligned}$ | $\begin{aligned} & 0.162 \text { [pixel] } \\ & 0.001 \text { [mm] } \end{aligned}$ | 0.001 | 0.010 | 0.022 | 0.000 | 0.000 |



The correlation between camera internal parameters determined by the bundle adjustment. White indicates a full correlation between the parameters, ie. any change in one can be fully compensated by the other. Black indicates that the parameter is completely independent, and is not affected by other parameters.


The number of Automatic Tie Points (ATPs) per pixel, averaged over all images of the camera model, is color coded between black and white. White indicates that, on average, more than 16 ATPs have been extracted at the pixel location. Black indicates that, on average, 0 ATPs have been extracted at the pixel location. Click on the image to the see the average direction and magnitude of the reprojection error for each pixel. Note that the vectors are scaled for better visualization. The scale bar indicates the magnitude of 1 pixel error.

Camera Rig «MicaSense 5 band» Relatives. Images: 1420

|  | Transl X[m] | Transl Y [m] | Transl Z [m] | Rot X[degree] | Rot Y[degree] | Rot Z [degree] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RedEdge_5.5_1280×960 (Green) | Reference Camera |  |  |  |  |  |
| RedEdge_5.5_1280×960 (Blue) |  |  |  |  |  |  |
| Initial Values | 0.030 | 0.000 | 0.000 | -0.257 | 0.209 | 0.431 |
| Optimized values | 0.030 | 0.000 | 0.000 | -0.347 | 0.184 | 0.428 |
| Uncertainties (sigma) |  |  |  | 0.006 | 0.008 | 0.001 |
| RedEdge_5.5_1280×960 (Red) |  |  |  |  |  |  |
| Initial Values | 0.000 | 0.022 | 0.000 | -0.762 | 0.270 | 0.209 |
| Optimized values | 0.000 | 0.022 | 0.000 | -0.814 | 0.259 | 0.203 |
| Uncertainties (sigma) |  |  |  | 0.006 | 0.008 | 0.001 |
| RedEdge_5.5_1280x960 (NIR) |  |  |  |  |  |  |
| Initial Values | 0.030 | 0.022 | 0.000 | -0.421 | -0.016 | 0.260 |
| Optimized values | 0.030 | 0.022 | 0.000 | -0.490 | 0.028 | 0.258 |
| Uncertainties (sigma) |  |  |  | 0.009 | 0.011 | 0.001 |
| RedEdge_5.5_1280×960 (Red edge) |  |  |  |  |  |  |
| Initial Values | 0.015 | 0.011 | 0.000 | 0.029 | 0.369 | 0.290 |
| Optimized values | 0.015 | 0.011 | 0.000 | -0.044 | 0.370 | 0.282 |
| Uncertainties (sigma) |  |  |  | 0.006 | 0.008 | 0.001 |

## 2D Keypoints Table

|  | Number of 2D Keypoints per Image | Number of Matched 2D Keypoints per Image |
| :--- | :--- | :--- |
| Median | 10000 | 4574 |
| Mn | 10000 | 1628 |
| Max | 10000 | 6905 |
| Mean | 10000 | 4595 |

## 2D Keypoints Table for Camera RedEdge_5.5_1280x960 (Blue)

|  | Number of 2D Keypoints per Image | Number of Matched 2D Keypoints per Image |
| :--- | :--- | :--- |
| Median | 10000 | 4181 |
| Mn | 10000 | 2590 |
| Max | 10000 | 5121 |
| Mean | 10000 | 3992 |

2D Keypoints Table for Camera RedEdge_5.5_1280x960 (Green)

|  | Number of 2D Keypoints per Image | Number of Matched 2D Keypoints per Image |
| :--- | :--- | :--- |
| Median | 10000 | 4831 |
| Mn | 10000 | 1628 |
| Max | 10000 | 6905 |
| Mean | 10000 | 4846 |

2D Keypoints Table for Camera RedEdge_5.5_1280x960 (Red)

|  | Number of 2D Keypoints per Image | Number of Matched 2D Keypoints per Image |
| :--- | :--- | :--- |
| Median | 10000 | 4620 |


| Mn | 10000 | 2883 |
| :--- | :--- | :--- |
| Max | 10000 | 5489 |
| Mean | 10000 | 4313 |

## 2D Keypoints Table for Camera RedEdge_5.5_1280x960 (NIR)

|  | Number of 2D Keypoints per Image | Number of Matched 2D Keypoints per Image |
| :--- | :--- | :--- |
| Median | 10000 | 3983 |
| Mn | 10000 | 2497 |
| Max | 10000 | 5100 |
| Mean | 10000 | 3754 |

2D Keypoints Table for Camera RedEdge_5.5_1280x960 (Red edge)

|  | Number of 2D Keypoints per Image | Number of Matched 2D Keypoints per Image |
| :--- | :--- | :--- |
| Median | 10000 | 4031 |
| Mn | 10000 | 2751 |
| Max | 10000 | 4918 |
| Mean | 10000 | 3947 |

Median / 75\%/ Maximal Number of Matches Between Camera Models

|  | RedEdge_5.5_12... <br> (Blue) | RedEdge_5.5_1... <br> (Green) | RedEdge_5.5_128... <br> (Red) | RedEdge_5.5_128... <br> (NIR) | RedEdge_5....(Red <br> edge) |
| :--- | :--- | :--- | :--- | :--- | :--- |
| RedEdge_5.5_1280×960 <br> (Blue) | $160 / 569 / 3551$ | $151 / 423 / 2342$ | $152 / 525 / 1711$ | $82 / 208 / 767$ | $120 / 364 / 1249$ |
| RedEdge_5.5_1280×960 <br> (Green) |  | $198 / 564 / 4209$ | $142 / 397 / 1909$ | $61 / 158 / 876$ | $109 / 303 / 1468$ |
| RedEdge_5.5_1280x960 <br> (Red) |  |  | $172 / 660 / 3847$ | $101 / 258 / 965$ | $137 / 427 / 1364$ |
| RedEdge_5.5_1280x960 <br> (NIR) |  |  |  | $99 / 520 / 4069$ | $97 / 272 / 970$ |
| RedEdge_5.5_1280x960 <br> (Red edge) |  |  |  |  | $119 / 451 / 3580$ |

3D Points from 2D Keypoint Matches

|  | Number of 3D Points Observed |
| :--- | :--- |
| In 2 Images | 301406 |
| In 3 Images | 64814 |
| In 4 Images | 31894 |
| In 5 Images | 18581 |
| In 6 Images | 13134 |
| In 7 Images | 9321 |
| In 8 Images | 7006 |
| In 9 Images | 5485 |
| In 10 Images | 4482 |
| In 11 Images | 3726 |
| In 12 Images | 3171 |
| In 13 Images | 2631 |
| In 14 Images | 2350 |
| In 15 Images | 2035 |
| In 16 Images | 1696 |
| In 17 Images | 1465 |
| In 18 Images | 1369 |
| In 19 Images | 1098 |
| In 20 Images | 953 |
| In 21 Images | 891 |
| In 22 Images | 831 |
| In 23 Images | 750 |
| In 24 Images | 648 |
|  |  |


| In 25 Images | 590 |
| :---: | :---: |
| In 26 Images | 543 |
| In 27 Images | 498 |
| In 28 Images | 436 |
| In 29 Images | 404 |
| In 30 Images | 335 |
| In 31 Images | 297 |
| In 32 Images | 287 |
| In 33 Images | 287 |
| In 34 Images | 238 |
| In 35 Images | 207 |
| In 36 Images | 212 |
| In 37 Images | 163 |
| In 38 Images | 146 |
| In 39 Images | 132 |
| In 40 Images | 128 |
| In 41 Images | 118 |
| In 42 Images | 89 |
| In 43 Images | 80 |
| In 44 Images | 57 |
| In 45 Images | 60 |
| In 46 Images | 53 |
| In 47 Images | 41 |
| In 48 Images | 33 |
| In 49 Images | 32 |
| In 50 Images | 28 |
| In 51 Images | 16 |
| In 52 Images | 18 |
| In 53 Images | 15 |
| In 54 Images | 12 |
| In 55 Images | 4 |
| In 56 Images | 6 |
| In 57 Images | 9 |
| In 58 Images | 11 |
| In 59 Images | 7 |
| In 60 Images | 4 |
| In 61 Images | 3 |
| In 62 Images | 1 |
| In 64 Images | 3 |
| In 66 Images | 1 |
| In 67 Images | 1 |

##  <br> 



Figure 5: Computed image positions with links between matched images. The darkness of the links indicates the number of matched 2D keypoints between the mages. Bright links indicate weak links and require manual tie points or more images. Dark green ellipses indicate the relative camera position uncertainty of the bundle block adjustment result.

Relative camera position and orientation uncertainties

|  | $\mathrm{X}[\mathrm{m}]$ | $\mathrm{Y}[\mathrm{m}]$ | $\mathrm{Z}[\mathrm{m}]$ | Omega $[$ degree $]$ | Phi [degree] | Kappa [degree] |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Mean | 0.009 | 0.008 | 0.010 | 0.027 | 0.018 | 0.005 |
| Sigma | 0.003 | 0.003 | 0.006 | 0.012 | 0.008 | 0.001 |

## Ground Control Points

| GCP Name | Accuracy XY/Z [m] | Error X[m] | Error Y $[\mathrm{m}]$ | Error Z[m] | Projection Error [pixel] | Verified/Marked |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Pa5 (3D) | $0.020 / 0.020$ | 0.001 | 0.026 | -0.002 | 0.655 | $19 / 19$ |
| Pa4 (3D) | $0.020 / 0.020$ | -0.017 | -0.018 | -0.003 | 0.567 | $26 / 26$ |
| Pa3 (3D) | $0.020 / 0.020$ | -0.021 | -0.006 | -0.008 | 0.540 | $25 / 25$ |
| Pa2 (3D) | $0.020 / 0.020$ | 0.016 | -0.013 | -0.001 | 0.637 | $20 / 20$ |
| Pa1 (3D) | $0.020 / 0.020$ | 0.020 | 0.011 | 0.009 | 0.469 | $24 / 24$ |
| Mean [m] |  | 0.000029 | 0.000007 | -0.000987 |  |  |
| Sigma [m] |  | 0.016656 | 0.016265 | 0.005590 |  |  |
| RMS Error [m] |  | 0.016656 | 0.016265 | 0.005676 |  |  |

Localisation accuracy per GCP and mean errors in the three coordinate directions. The last column counts the number of calibrated images where the GCP has been automatically verified vs. manually marked.

## Absolute Geolocation Variance

| Mn Error [m] | MaxError [m] | Geolocation Error X[\%] | Geolocation Error Y[\%] | Geolocation Error Z[\%] |
| :--- | :--- | :--- | :--- | :--- |
| - | -15.00 | 0.00 | 0.00 | 0.00 |
| -15.00 | -12.00 | 0.00 | 0.00 | 0.00 |
| -12.00 | -9.00 | 0.00 | 0.00 | 0.00 |
| -9.00 | -6.00 | 0.00 | 0.00 | 0.00 |
| -6.00 | -3.00 | 0.00 | 0.00 | 0.00 |
| -3.00 | 0.00 | 48.31 | 45.92 | 50.35 |
| 0.00 | 3.00 | 51.69 | 54.08 | 49.65 |
| 3.00 | 6.00 | 0.00 | 0.00 | 0.00 |
| 6.00 | 9.00 | 0.00 | 0.00 | 0.00 |
| 9.00 | 12.00 | 0.00 | 0.00 | 0.00 |
| 12.00 | 15.00 | 0.00 | 0.00 | 0.00 |
| 15.00 | - | 0.00 | 0.00 | 0.00 |
| Mean [m] |  | 0.274949 | -0.190912 | 4.725114 |
| Sigma [m] |  | 0.55629 | 0.585661 | 0.349845 |
| RMS Error [m] |  | 0.620533 | 0.615992 | 4.738047 |

Min Error and Max Error represent geolocation error intervals between -1.5 and 1.5 times the maximum accuracy of all the images. Columns $\mathbf{X}$, Y , $\mathbf{Z}$ show the percentage of images with geolocation errors within the predefined error intervals. The geolocation error is the difference between the initial and computed image positions. Note that the image geolocation errors do not correspond to the accuracy of the observed 3D points.

| Geolocation Bias | X | Y | Z |
| :--- | :--- | :--- | :--- |
| Translation $[\mathrm{m}]$ | 0.276843 | -0.192589 | 4.724598 |

Bias between image initial and computed geolocation given in output coordinate system.

## Relative Geolocation Variance

| Relative Geolocation Error | Images X[\%] | Images $\mathrm{Y}[\%]$ | Images $\mathrm{Z}[\%]$ |
| :--- | :--- | :--- | :--- |
| $[-1.00,1.00]$ | 100.00 | 100.00 | 100.00 |
| $[-2.00,2.00]$ | 100.00 | 100.00 | 100.00 |
| $[-3.00,3.00]$ | 100.00 | 100.00 | 100.00 |
| Mean of Geolocation Accuracy $[\mathbf{m}]$ | 5.000000 | 5.000000 | 10.000000 |
| Sigma of Geolocation Accuracy $[\mathrm{m}]$ | 0.000000 | 0.000000 | 0.000000 |
|  |  |  |  |

## System Information

|  | CPU: Intel(R) Core(TM) i7-8700 CPU @3.20GHz |
| :--- | :--- |
| Hardware | RAM: 32GB |
| GPU: Intel(R) UHD Graphics 630 (Driver: 23.20.16.4974), NMDIA Quadro P3200 (Driver: 23.21.13.9174) |  |
| Operating System | Windows 11, 64-bit |

## Coordinate Systems

| Image Coordinate System | WGS 84 (EGM96 Geoid) |
| :--- | :--- |
| Ground Control Point (GCP) Coordinate System | ETRS89 / UTMzone 29N (EGM96 Geoid) |
| Output Coordinate System | ETRS89 / UTMzone 29N (EGM96 Geoid) |

## Processing Options

| Detected Template | Ag Multispectral |
| :--- | :--- |
| Keypoints Image Scale | Full, Image Scale: 2 |
| Advanced: Matching Image Pairs | Aerial Grid or Corridor |
| Advanced: Matching Strategy | Use Geometrically Verified Matching: yes |
| Advanced: Keypoint Extraction | Targeted Number of Keypoints: Custom, Number of Keypoints: 10000 |
|  | Calibration Method: Alernative <br> Internal Parameters Optimization: All |
| Advanced: Calibration | External Parameters Optimization: All <br> Rematch: Custom, yes |
| Rig «McaSense 5 band» processing | optimize relative rotation using a subset of secondary cameras |

## Point Cloud Densification details

## Processing Options

| Image Scale | multiscale, $1 / 2$ (Half image size, Default) |
| :--- | :--- |
| Point Density | Low (Fast) |
| Mnimum Number of Matches | 3 |
| 3D Textured Mesh Generation | no |
| LOD | Generated: no |
| Advanced: Image Groups | Blue, Green, Red, NIR, Red edge |
| Advanced: Use Processing Area | yes |
| Advanced: Use Annotations | yes |
| Time for Point Cloud Densification | $57 s$ |
| Time for Point Cloud Classification | NA |
| Time for 3D Textured Mesh Generation | NA |

## Results

| Number of Generated Tiles | 1 |
| :--- | :--- |
| Number of 3D Densified Points | 507369 |
| Average Density $\left(\right.$ per $\mathrm{m}^{3}$ ) | 30.62 |

## Processing Options

| DSMand Orthomosaic Resolution | $1 \times$ GSD (3.16 [cm/pixel]) |
| :--- | :--- |
| DSMFilters | Noise Filtering: yes <br> Surface Smoothing: yes, Type: Sharp |
| Radiometric calibration with reflectance target | yes |
| Index Calculator: Reflectance Map | Generated: yes <br> Resolution: $1 \times$ GSD $(3.16[\mathrm{~cm} / \mathrm{pixel}])$ <br> Merge Tiles: yes |
| Index Calculator: Indices | blue, green, red, nir, red_edge, ndvi |
| Time for DSMGeneration | 00 s |
| Time for Orthomosaic Generation | 00 s |
| Time for DTMGeneration | 00 s |
| Time for Contour Lines Generation | 00 s |
| Time for Reflectance Map Generation | $18 \mathrm{~m}: 34 \mathrm{~s}$ |
| Time for IndexMap Generation | $01 \mathrm{~m}: 44 \mathrm{~s}$ |

## Camera Radiometric Correction

| Camera Name | Band | Radiometric Correction Type | Reflectance target |
| :---: | :---: | :---: | :---: |
| RedEdge_5.5_1280x960 | Blue | Camera and Sun Irradiance | () |
| RedEdge_5.5_1280x960 | Green | Camera and Sun Irradiance | $\bigcirc$ |
| RedEdge_5.5_1280×960 | Red | Camera and Sun Irradiance | $\bigcirc$ |
| RedEdge_5.5_1280x960 | NIR | Camera and Sun Irradiance | $\bigcirc$ |
| RedEdge_5.5_1280x960 | Red edge | Camera and Sun Irradiance | $\bigcirc$ |

