

Simplex: Sweeping Their Way Ahead

Introduction

Simplex Mapping Solutions Ltd. was founded in 2013 by Shahar Barnea, Ph.D. and Ziv Shragai, Ph.D. Simplex, based in Herzeliya, Israel, is a global mapping service provider and operates projects in Africa, South America, China and the US in addition to Israel. Soon after the company was founded, Simplex developed the CaMundo sweeping camera system, which uses the Phase One iXU 150 camera. The system is based on a sweeping technique, which enables users to achieve large swath and 3D reconstruction in a small, portable system. Simplex's range of projects cover a wide array of industries from urban development monitoring, agriculture, forestry, and 3D products for volume measurement, dense DSM and DTM, high resolution orthomosaics (up to one cm GSD) and more.

Why Phase One Cameras?

"It comes down to our company slogan, "highest quality and cost-effective mapping combined." Phase One cameras provide us with a combination of high quality images and fast collection rate, at a cost effective offering vs. its competition" said Avi Aflalo, Simplex's CEO. He also said, "It was a perfect match for our sweeping concept, in which we needed to achieve a collection rate of less than a second per frame, with at least a full 50 MP resolution. It enables us to achieve the highest "pixel per second" rate compared with other high-end alternatives. Together, with the different lens options and Phase One's iX Controller, it is a clear cut winning combination for Simplex."



Integration of Phase One Cameras

Part of the reason Simplex choose to work with Phase One was the seamless integration Phase One provides with inertial navigation systems (INS) such as NovAtel, which Simplex use in their system. This saved Simplex significant integration time and allowed them to build their system with the iXU camera faster than they had ever expected. They also were impressed by the iX Controller and the Phase One software, iX Capture, which enables operators to control the camera and review the images while the images are being collected.

Using Phase One Camera

In 2015, Simplex was given an assignment that put their system to the test. The project was executed for one of the largest gas companies in the US mid-west, across three states. The project was done in collaboration with Chesapeake Bay Helicopters Inc. (CBH), a helicopter survey company from Virginia. Simplex installed its sweeping camera system, equipped with an iXU 150, 80 mm Schneider-Kreuznach lens, iX controller and NovAtel OEM628™ Triple-Frequency + L-Band GNSS Receiver on CBH's Cessna 172.

Simplex's system collects between one to eight images per sweep, and captures both nadir and two side oblique views in the pass. For this project, Simplex configured the system to collect three images per sweep, enough

for a corridor swath of approximately 4,000 feet, from an altitude of approximately 6,000 feet, (double the size of the required 2,000 feet corridor the gas company requested). The fast image collection of the iXU 150 and the unique features of the iX Controller enabled them to complete the collection ahead of schedule, even with changing light and climate conditions in a challenging mid-west US winter. Simplex produced orthomosaics for more than 2,500 miles of pipeline across three states.



The precision of the NovAtel INS, combined with the high accuracy of the Phase One iXU camera, was the right combination for Simplex and enabled them to fly just one pass over the complete project region, saving them many flight hours. One of the aspects that made the project's workflow proceed quickly was the automatic exposure feature of the camera, which helped capture images that were consistently and properly exposed. Simplex used automatic algorithms to process most of the areas and found that there was almost no need for human intervention or manual QA, because of the high quality images. The radiometry results of the large collection, despite changing light conditions, was well received by their customer.

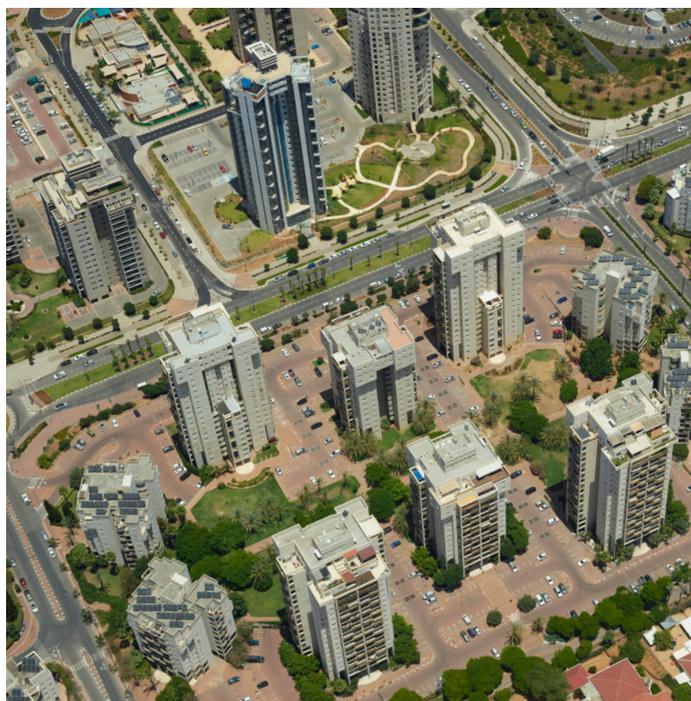
Simplex collected almost 100,000 images during this project and the Phase One camera performed flawlessly throughout the entire project. Simplex's relatively small-sized system, built with a Phase One iXU camera enabled the use of a local Cessna 172, which meant lower flying costs, while at the same time saving transit times. Simplex was able to offer the highest quality and cost-effective mapping service for this gas company and continues to provide similar services for other clients across the US and around the world thanks to their Phase One camera.

About Phase One

Phase One A/S is based in Copenhagen with offices in New York, London, Cologne, Tel Aviv, Tokyo and Hong Kong. Phase One Industrial is a division of Phase One and is dedicated to research, development and manufacturing of advanced hardware and imaging software solutions that meet the unique requirements of aerial photography users.

Project Accuracy

"We reached 1:500 scale mapping accuracy. This was achieved only after we switched to work with medium format Phase One cameras" said Avi Aflalo, CEO of Simplex. He added, "We are basing many of our future projects on the iXU camera system. We are going to use it for gas pipe survey, urban development and high resolution agriculture projects around the world."



Second generation system using iXU-RS 1000 (100 MP)

Takeaways

The Phase One camera proved to be an excellent return on investment for Simplex. By upgrading their collection capabilities from small format DSLR to medium format, it allowed them to extend the use of their collection system significantly and pursue larger projects. It helped set them apart as a provider of high quality images, with more demanding accuracy specifications and contributed to their 3D modeling deliverables.

The results that Simplex's achieved with the Phase One iXU 150 caused them to order an additional Phase One camera, the iXU-RS 1000. The new camera provided Simplex with 100 MP resolution and the same proven Phase One technology. Avi Aflalo commented, "With 100 MP resolution and the enhanced capture rate and speed, the new camera increased our 3D high-resolution reconstruction capabilities, area coverage and quality, and enabled us to offer exceptional deliverables to our client base."

To find out more about Phase One products, please visit <http://industrial.phaseone.com> and set up an appointment with one of our aerial photography experts for a demonstration.

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