



Dmapas' RAV4 with newly installed IP-S2 at Agua Magallanes control center.

Dmapas Launches Topcon's IP-S2 in South America

Stories and articles dealing with technology rarely convey a sense of adventure. This is story that describes a milestone event in the evolution of an established mapping company. The setting is one of the most commanding geographic areas of the world. The challenges and operations

that unfold can be classified as “once in a lifetime” experiences.

Technology and adventure meet on a global scale....

Mapas Digitales, S.A. (also known as Dmapas), is based in Santiago, Chile. With more than 15 years of experience

and operations, the company has become the leading provider of business solutions based on digital map data, GIS solutions, and exact street address databases for Chile, Argentina, and Peru; providing to their clients the most complete and dynamic data, spatially organized to help them on their business management. Dmapas databases cover over 93 percent of the population areas in Chile. In 2009, Dmapas created the second

BY C. JASON SMITH



Above: Particio Escobar (right) explains IP-S2 data products to Aguas Magallanes representatives.

Left: Jorge Gajardo connects IP-S2 cables for a test run.

country-specific mapping product in South America.

Dmapas collected its vast pool of street map data with mobile digital camera / GNSS receiver systems. The company operates six vehicles outfitted with Point Grey Research's Ladybug digital camera systems linked to GNSS receivers. Ladybug camera systems contain six individual sensor/lens units in a single enclosure. After collecting street data, software can stitch the six individual camera frames into single 360° panoramic or spherical images. Dmapas found that these systems met the needs of their customers for many years, but wanted to gain a competitive edge by adding mobile LiDAR to their services.

This change in Dmapas's operational strategy is a significant point of growth

for the company. As mapping technology moves into the future, customers are demanding a higher level of information. Adding LiDAR to Dmapas's customer-oriented solution equation would provide a more accurate level of geopositioning for measurements and feature mapping. In addition, LiDAR point clouds can be exported for use in CAD-based engineering software to create profiles and cross sections of roadways.

In May 2010, Alfredo Escobar, Dmapas's director general, expressed interest in the IP-S2 and traveled to Duluth, Georgia for a demonstration. Topcon's mobile mapping system uses a GNSS receiver and Ladybug camera, but also includes LiDAR laser scanners. At the time of his visit, he had the opportunity to collect data with

Topcon's IP-S2 and go through the steps of data processing and analysis. Escobar returned to Chile to seek projects for which LiDAR technology could be used.

By December 2010, the opportunity for a pilot project became a reality. Dmapas was engaged to perform a detailed mapping project for Aguas Magallanes (<http://www.aguasmagallanes.cl/>), the company that supplies water to the Antarctic and Magellan provinces of Chile.

Aguas Magallanes is headquartered in Punta Arenas, Chile, the southernmost city in the world. This city is located in Antartica Chilean Province and is a short 800-mile hop to the closest point of land on the continent of Antarctica. Punta Arenas borders on the Strait of Magellan, an important passageway



Dmapas' new name XYGO represents the start of an expanded business model enabled by LiDAR technology

The geographic landscape south of Punta Arenas bordering the Strait of Magellan.

connecting the Atlantic and Pacific Oceans navigated by the explorer Ferdinand Magellan in 1520. The city is also the landing point for trekkers and tourists visiting the geographic region known as Patagonia.

To manage and plan water distribution, Aguas Magallanes needs updated street maps and road cross-sections of three cities - Punta Arenas, Porvenir, and Puerto Natales. For the level of detail and degree of accuracy required, Dmapas determined that the IP-S2's combined LiDAR and 360° spherical imagery would be the perfect solution and subsequently placed an order for a system.

Dmapas's IP-S2 was shipped from Topcon's facility in Livermore, California to Santiago, Chile at the end of January, 2011. As part of the IP-S2 deployment, Topcon provides on site installation and training. Richard Rybka, Topcon's mobile mapping specialist, was selected to assist in the project. Patricio Escobar,



Dmapas's operations manager for Latin America, decided to install the system onsite in Punta Arenas rather than at headquarters in Santiago to expedite work on the project. Dmapas's goal is to

collect the data for all three cities by the end of February.

Moving the Ip-S2 system and the vehicle on which it was to be installed—a Toyota RAV4—from Santiago to Punta



Streets of downtown Punta Arenas reveal the functional simplicity of this historic seaport.

Arenas required a special transportation strategy. A glacier north of Punta Arenas blocks vehicular travel making the city accessible only by air or sea. The IP-S2 system was loaded in the RAV4 and driven to the port at Puerto Montt for transportation by ship.

In late January, Escobar, Rybka, and Jorge Gajardo, project manager, flew from Santiago to Punta Arenas to start the installation and training. The car and system were due to arrive at the port in Puerto Natales at 9 a.m. the same day. A driver was waiting to bring the car overland two hours south to Punta Arenas. At sea, the ship lost one of the engines and had to travel at reduced speeds. Later that day, a storm blew the ship across a point of land. Fifty vehicles fell from an upper deck to the deck below, but the RAV4 escaped damage. The payload finally arrived late Monday night, was picked

up by the waiting driver, and appeared in Punta Arenas Tuesday morning ready for the installation to begin.

Aguas Magallanes provided the team with space in one of their mechanical shops. Installation of the IP-S2 and mounting system on the RAV4 was completed in a day. The next two days were spent checking the mobile mapping system in the field and training Dmapas's employees on operating the equipment and collection of data. At the end of the week, Rybka returned to the U.S. and Escobar to the company's headquarters in Santiago. Gajardo remained in Punta Arenas with the car and IP-S2 to begin data collection for the project.

After the mapping project is completed, Dmapas will provide Aguas Magallanes with high-level deliverables: LiDAR point clouds of three project cities; cross sections of 250 different streets for each city;

measurements; and Excel reports. The services and products that Dmapas can now provide to customers using the IP-S2 would have been impossible to produce using GNSS and camera systems.

The story of Dmapas and their venture into IP-S2 technology has one more interesting twist. To signify the change in Dmapas's operational technology and business model, the company will be identified soon by a new name, XYGO, demonstrating a new brand to illustrate the personalized service they bring to their clients. ■

(More information about Dmapas can be found on their website: <http://www.dmapas.com/>.)

Dr. C. Jason Smith is co-founder of Disciple and Publish, a New York-based writing cooperative. He has written articles about global survey projects including Chile, Argentina and Egypt.