

June 2012

Aerial data acquisition

TERRASYSTEM has the necessary equipment, tools and know-how to perform efficiently and professionally air campaigns for the acquisition of environmental data.

TERRASYSTEM uses airborne systems to capture true colours, multi spectral and thermal images, height profiles and fluxes of gases. For the measurement campaigns TERRASYSTEM has activated collaborations with airplane work companies, while for the instrumental part it collaborates to the development of the sensors with universities, research institutes and highly specialized companies, leader in this sector.

TERRASYSTEM carried out aerial survey campaigns on behalf of research institutes and companies in the context of national and international research projects.

THE REMOTE SENSING PLATFORMS



Sky Arrow 650 TC/TCNS

Certificated FAA / JAR, it is entirely made of carbon and kevlar. It is equipped with Rotax 100 HP engine and it has a fuel distance of 3.5 hours. It is an extremely versatile aircraft and can take off and land with just 500 m long runway. Its flight altitude goes from 300 to 4000 m above sea level.

P68 Observer Vulcanair

It is a 6-seater twin-engine globally recognized among the most productive for tasks of observation and patrol. It was created to offer an alternative and cheaper solution in the fields where the use of the helicopter has so far prevailed. It is equipped with two Lycoming IO-360-A1B6 200 hp engines, and it reaches a cruising speed of 300 km / h. It can do overflights up to 5490 m above sea level.



FIELDS OF APPLICATION

- Environmental monitoring
- Precision farming
- Cartography
- Aerophotogrammetry

TARGETS

- Central and local public bodies
- Universities and Research Institutes
- Agribusiness, consortia and producers organizations
- Professionals (engineering, architecture, agro-forestry)

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ACQUIRED DATA SPECIFICATIONS

AERIAL DATA FROM MULTI-SPECTRAL SYSTEMS

Datum	Sensor	Features	Resolution at 1000m GSD (ground simple distance)
multi-spectral Redlake image	RedLake MS4100	3 bands 8bit (Red, Green, NIR) 1920 x 1075 pixel	0.58m
multi-spectral ASPIS Image	New ASPIS	12 selectable bands 12 bit, (400-950nm, 2048 x 2048 pixel)	0.20m
Real colours image	Hasselblad H3dII-31	6496 x 4872 pixel, (31 Mpixel)	0.14m

ASPIS interference filters

Band central frequency (nm)	Spectral window width (nm)
531	10
550	20
715	10
420	20
570	10
750	10
900	20
700	10
680	20
500	20
800	20
780	20



False colours Redlake image



False colours ASPIS image

AERIAL DATA FROM THERMAL AND SWIR CAMERAS

Datum	Sensor	Features	Resolution at 1000m GSD (ground simple distance)
Thermal image	Flir SC500	Thermal band 8-12 um, 320 x 240 pixel	2.72m
Swir image	Xeva FPA-2.5-320	Bands 900 - 2500 nm	2.72m



Real colours Hasselblad image

AERIAL ATMOSPHERIC DATA

Datum	Sensor
Measures of fluxes of CO2 and other atmospheric gases	MFP

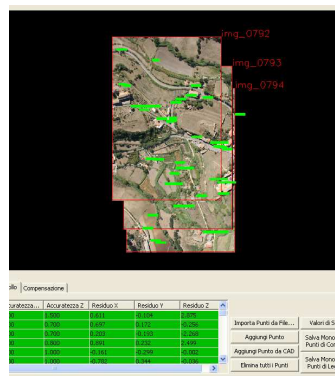
The acquisition systems allow to capture different kind of data concurrently

DATA PRE-PROCESSING

It is done by means of software specifically developed, that allow to perform:

► Quality control of the acquired data, through automatic tools

Geometry of the area covered by the acquired images, lateral and longitudinal overlap between images, points of capture.

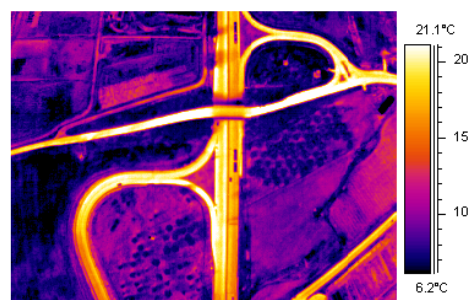


► Geometric correction (orthophoto) and mosaiking

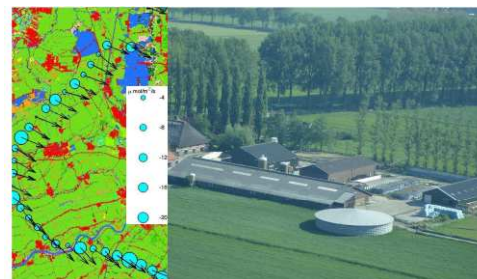
With direct georeferencing by GPS/IMU data

► Radiometric correction of the multi-spectral data

► Map of the image angles of view (azimut and off-nadir)



Thermal Flir SC500 image



Measurements of CO2 fluxes by MFP