planetek italia + HEXAGON

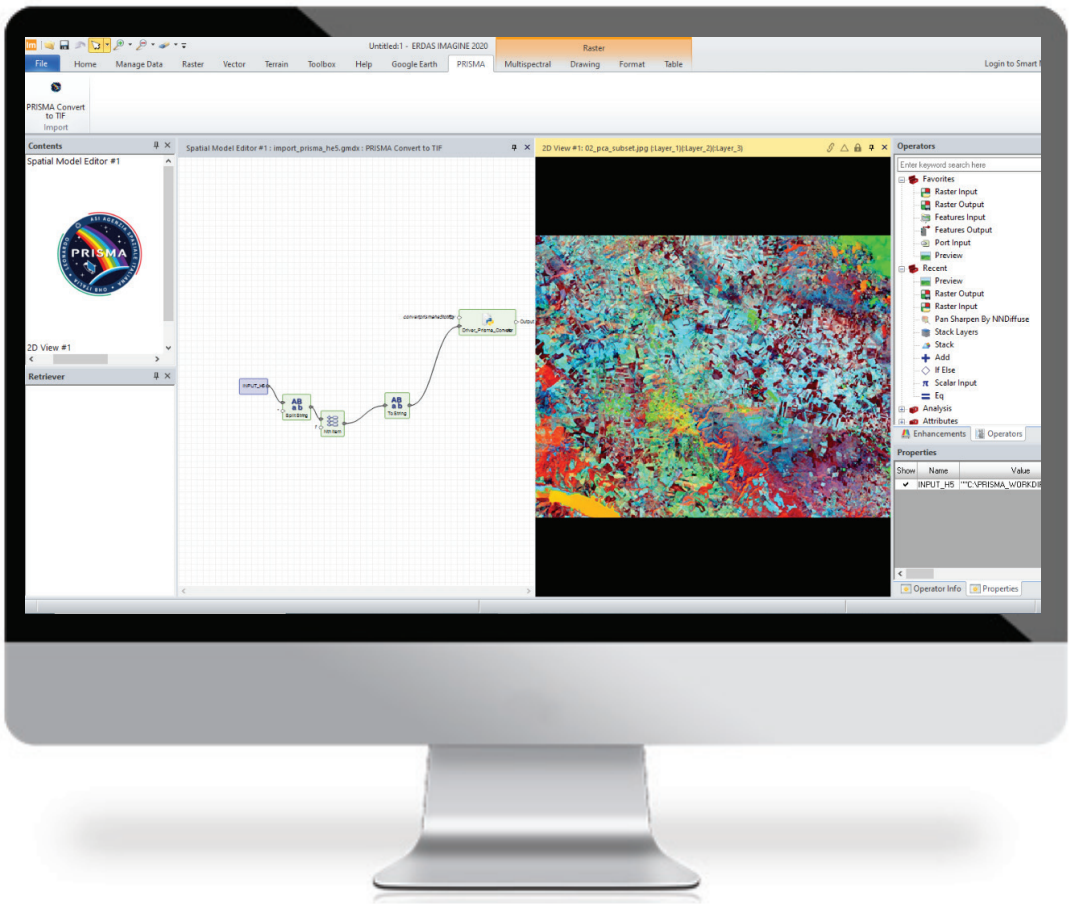
Hexagon Diamond Partner

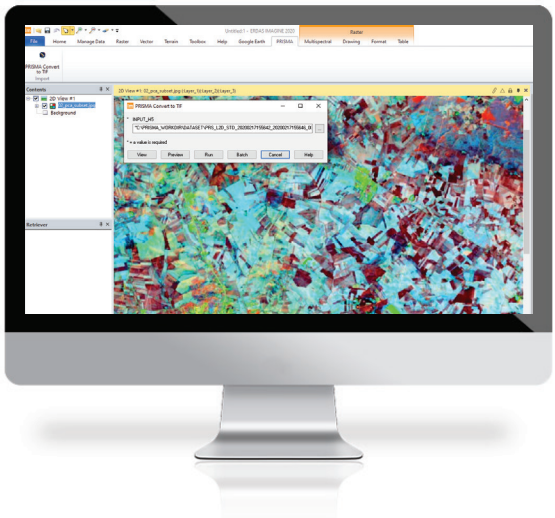
Exploiting the Potential of PRISMA Hyperspectral Satellite Data with ERDAS IMAGINE

High-resolution space and spectral satellites have changed the way we think about the environment and environmental phenomena. This is especially true with PRISMA (Hyperspectral Precursor of the Application Mission), a cutting-edge Earth observation system. PRISMA integrates a hyperspectral sensor with a medium-resolution camera, sensitive to all colours (panchromatic).

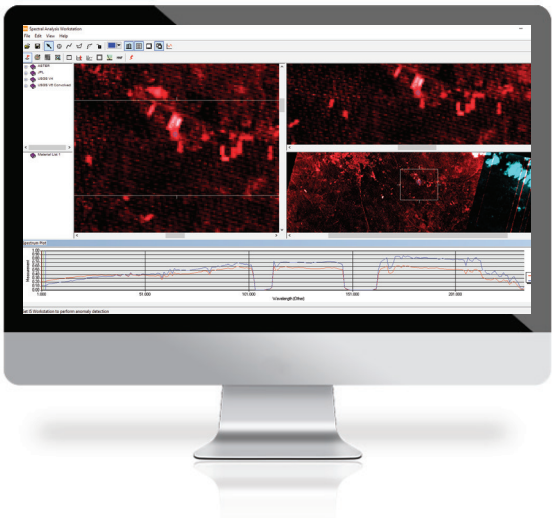
This way, PRISMA is able to distinguish not only the geometric characteristics of observed objects, but also the chemical-physical composition of the surface of the Earth. In fact, each material has its own spectral signature, an actual fingerprint: a unique combination of colours, named as spectral bands. PRISMA's electro-optical equipment can analyze this fingerprint from its orbit, at an altitude of 615 km, by carrying out state-of-the-art monitoring able to identify objects and detect the characteristics of the area under observation.

Planetek Italia has developed a plugin for ERDAS IMAGINE that allows users to manage and process PRISMA data. This plugin, developed using Spatial Modeler, converts data in the PRISMA format into the easier-to-manage ERDAS .img format. It also performs some preprocessing steps, making the use of PRISMA data in the ERDAS Hyperspectral Workstation very user-friendly.





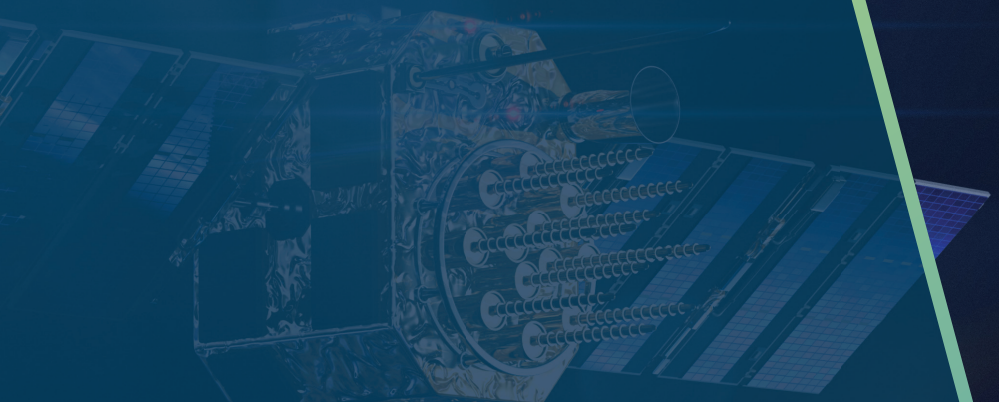
Click a button and select the H5 file, and it will be converted and preprocessed.



PRISMA data processed with the ERDAS Hyperspectral Analysis Workstation tool.

The ERDAS Hyperspectral Analysis module is intended to address the needs of both remote sensing experts and novices who simply want results extracted from hyperspectral PRISMA datasets. For analyst who are not hyperspectral remote sensing experts, workflows provide easy access to spectral analysis tasks. For this approach, an analyst determines what his or her objective is and chooses accordingly from a list of tasks:

- Anomaly Detection
- Target Detection
- Material Mapping
- Material Identification



Open Access to PRISMA Hyperspectral Data

PRISMA Hyperspectral data is available on the website **https://prisma.asi.it**. The Italian Space Agency (ASI) has adopted a free data access policy with only a few restrictions. Data is provided free of charge and is available to everyone — anybody can register as a user.

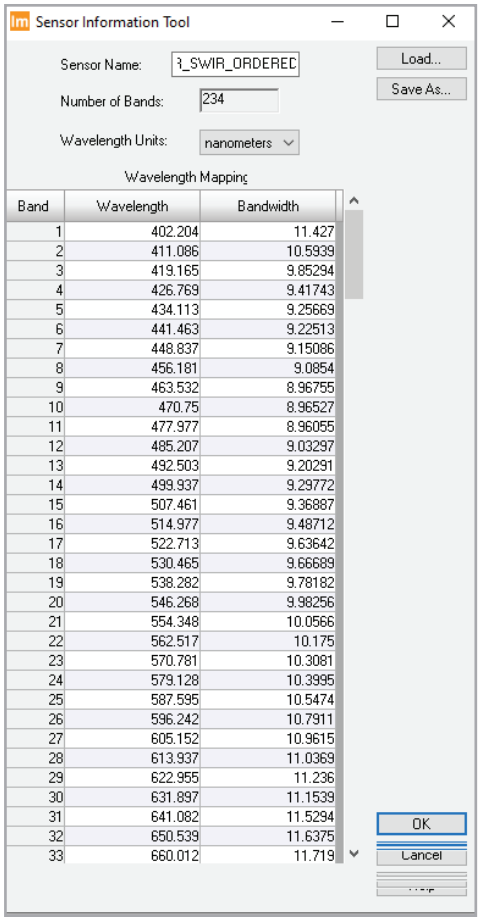
PRISMA, which started its journey in space on 22 March 2019 aboard a VEGA carrier, represents excellence derived from teamwork between Italian scientific and industrial institutions. It enhances the Italian Space Agency's (ASI) Earth observation capabilities, which were previously based on the Synthetic Aperture Radars of the COSMO-SkyMed constellation.

Planetek Italia was responsible for designing and developing the geocoding sub-system of the project's Ground Space segment. Notably, Planetek Italia defined the architectural design for the Geolocation and Geocoding components, for both hyperspectral and panchromatic products and for developed software. Today, PRISMA provides an innovative hyperspectral optical sensor that offers an unprecedented abundance of information for different applications. Specifically, the equipment onboard the satellite includes an imaging spectrometer capable of acquiring VNIR (Visible and Near-Infrared) and SWIR (Short-Wave Infrared) products with a 30-meter spatial resolution and a panchromatic camera with a 5-meter spatial resolution.

Water quality, presence of algae, crop status, risk of drought and forest fires, air pollution levels: images from PRISMA add brand new capabilities and dimensions to the monitoring and analysis of our planet. The successful exploitation of this data will add further depth to the management of natural resources and emergencies while also contributing to the Sustainable Development Goals (SDGs) of the United Nations.

To this aim, the plugin developed by Planetek Italia:

- Starts with two different data cubes (VNIR and SWIR), which are contained in the H5 file, and creates a single-layer stack of 234 bands in TIF format
- Rescales reflectance values from the UINT16 data type (0-65535) to 0-1
- Creates a mask layer, using the metadata of the original data, that allows the user to exclude bad pixels from processing
- Comes with a ready-to-use “saf” file that contains all the necessary information to work with the PRISMA sensor in the ERDAS Hyperspectral Analysis Workstation



The plugin comes with a ready-to-use “saf” file that contains all the necessary information to work with the PRISMA sensor in the ERDAS Hyperspectral Analysis Workstation.

Install and Try the PRISMA Plugin

If you want to install and try the plugin to process PRISMA data in ERDAS IMAGINE, please send an email to **hexagon@planetek.it**

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications. Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon’s Geospatial division creates solutions that deliver a 5D smart digital reality with insight into what was, what is, what could be, what should be, and ultimately, what will be.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 4.4bn USD. Learn more at **hexagon.com** and follow us **@HexagonAB**.

© 2020 Hexagon AB and/or its subsidiaries and affiliates. All rights reserved. Hexagon and the Hexagon logo are registered trademarks of Hexagon AB or its subsidiaries.

All other trademarks or service marks used herein are property of their respective owners.