

Sen4CAP as a Service – cloud based agricultural monitoring using satellite imagery

- Ready-to-use remote sensing software solution
- Based on the CloudFerro EO Cloud and data, e.g. CREODIAS
- Uses Earth Observation (EO) Sentinel data for monitoring tasks
- Supports the Common Agricultural Policy (CAP)
- Provides biophysical indicators, crop type map, grassland mowing, and agricultural practices monitoring in one place





Sen4CAP on CREODIAS brings together fast EO data access, reliable and powerful cloud-computing and innovative analytics tailored to our needs.

We are very pleased about the smooth usage of the system and the helpfulness and responsiveness of the Sen4CAP CloudFerro support team in Germany and Poland.



Benjamin Kroll,
Ministry for Energy Transition,
Agriculture, Environment, Nature
Conservation and Digitalisation
of the State of Schleswig-Holstein



Using Sen4CAP on the EO Cloud CREODIAS relieved us not only from installation efforts but allows us to scale up the processing power and storage capacity easily according to our needs.

We started with a small testing environment to evaluate the solution and have upgraded in the meantime to multiple instances. Now we are in a complete statewide pilot project to fully test the operational usage of the provided services and cloud-infrastructure regarding Checks by Monitoring.



Okke Gerhard,
Officer, Saxon State Ministry
for Energy, Climate Protection,
Environment and Agriculture

Check by monitoring for CAP

The European Union aims with CAP at a continuous improvement of a sustainable and growing European agricultural productivity while ensuring a decent standard of living of big and small farmers within the EU.

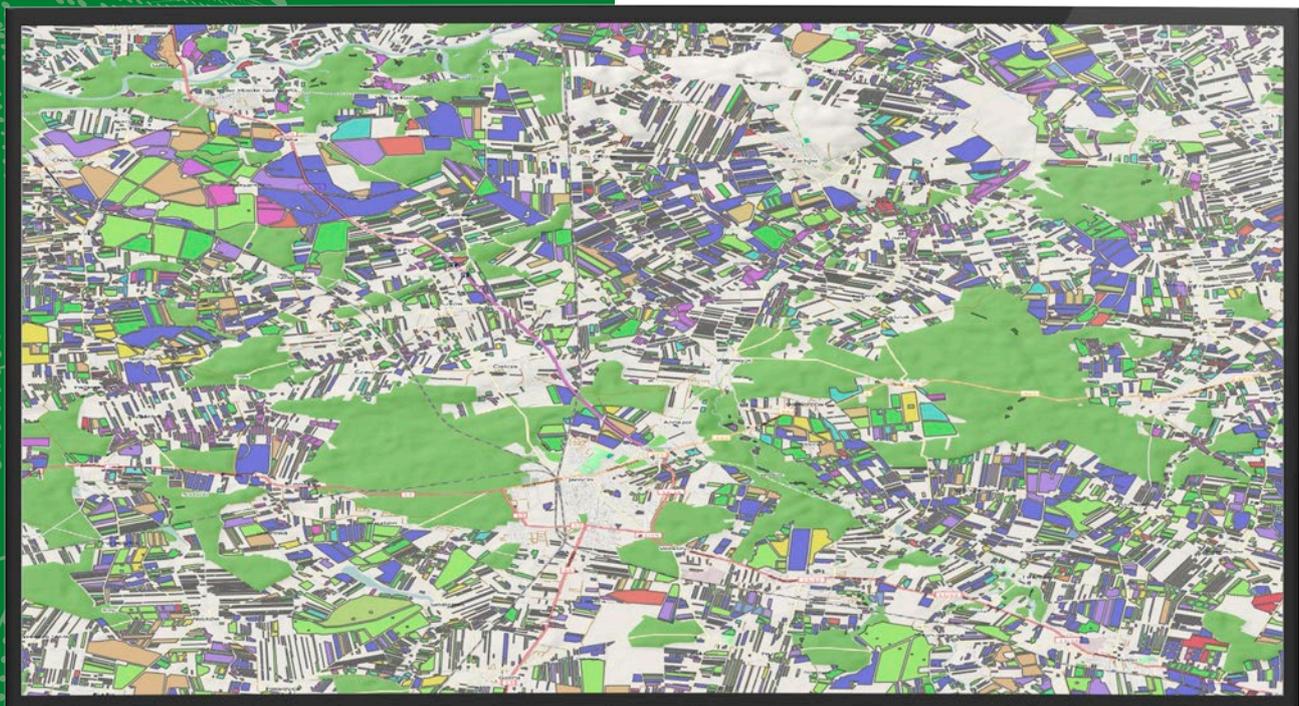
The Check by Monitoring is an important CAP instrument to supporting this policy. However, it is a challenge to get the required information in time and with the required reliability and timeliness:

- » Big areas need to be checked
- » Standard methods with in-situ inspection are expensive and time-consuming and can cover only a small percentage of the total of agricultural parcels

Remote sensing has become an established technology to address these challenges, recommended by European Court of Auditors. Especially the European Copernicus Programme with Sentinel satellites together with the dedicated open-source application Sen4CAP form a unique solution to support European and national CAP stakeholders.

Copernicus Sentinel data and Sen4CAP

Sen4CAP uses high resolution satellite images from the Copernicus programme to regularly monitor individual fields and large areas at the same time. It is an end-to-end processing and analysis pipeline which gives users access to validated algorithms, products, workflows and best practices for agriculture monitoring. Sen4CAP follows a modern and modular approach and thus offers to its users the possibility to rapidly establish further high level products tailored to regional needs.



Visualization of the results of processing performed by the Polish Institute of Geodesy and Cartography

Customized information products to fulfil CAP reporting needs with respect to crop diversification, permanent grassland identification, EFA-land lying fallow, EFA-catch crops and EFA-nitrogen-fixing crops can be generated. These complex information products are derived by combining intermediate layers such as biophysical variables, crop type mapping, growing vegetation indicators or grassland mowing detection.

Important to note: Since each information layer is accompanied by a conformity assessment the system can serve as a very valuable decision support system.

Sen4CAP as a Service

CloudFerro offers Sen4CAP software as a Service (Sen4CAP aaS) on CloudFerro's EO Clouds, e.g. on CREODIAS. Designed to fulfill the needs of agricultural paying agencies and all national and European stakeholders of the CAP Policy, Sen4CAP can be beneficiary for everyone interested in monitoring environmental changes and agricultural activities.

The Sen4CAP-CF solutions takes full advantage of Sen4CAP and the EO Cloud infrastructure.

- » The system comes ready to use as prepared VM images
- » It is available on subscription bases as a full-managed package including EO-data, managed cloud services and expert premium support. Users can directly access a complete repository of satellite data while harnessing the processing capabilities of the computing cloud. This significantly accelerates the processing and allows the usage of multiple datasets also back in time.

The managed cloud services support fully operational workflows including backup strategies and parallel instances for testing of new software versions and variations of parameter settings.

Sen4CAP aaS in details

Users can select on the EO Cloud an already prepared Virtual Machine (VM) image on which the latest stable Sen4CAP software is installed and checked.

The VM is configured and ready-to-use. It not only includes Sen4CAP, but it is also equipped with all additional software components required for Sen4CAP (e.g. PostgreSQL Database and the MAJA processor) execution. Furthermore, it is connected with all EO data collections, which are needed by the Sen4CAP:

- » Sentinel-1
- » Sentinel-2
- » Landsat-8
- » SRTM (DEM) and SWBD (Water Body) data were also integrated

Once logged into the VM, the user can immediately run the Sen4CAP software and benefits from both the direct access to the comprehensive Copernicus Sentinel satellite data repository and the dynamically scalable processing opportunities of the CREODIAS cloud computing environment. The VM with Sen4CAP can be accessed e.g. through web browser or Remote Desktop using X2Go Client.



Sen4CAP aaS in a nutshell

Retrieve results compliant with CAP policies

- » Recommended by the European Commission
- » Convenient workflows with modern technology
- » Fast results – also for large areas and long monitoring periods
- » Allow you to focus on your main task and rely on CloudFerro's managed cloud based solution
- » Quick and simple to launch
- » Guaranteed SLA
- » Scalable computing power and storage – according to your needs
- » Easy cost control with transparent price models and subscription plans

Example: Assuming well prepared data, an area of about 10.000 sqkm CAP compliant results can be calculated within less than 3 days.

Sen4CAP as a Service – subscription plans

Sen4CAP aaS		Plan 1 Recommended for areas up to 50.000 sqkm	Plan 2 Recommended for full operational processing and medium to large areas
On-line EO Data Access	» Sentinel-1, » Sentinel-2, » Landsat-8, » SRTM (DEM) and SWBD (Water Body) data are also integrated	✓	✓
EO Cloud Services	Pre-installed Sen4CAP software, including: » MAJA Processor » Postgres SQL Database	✓	✓
Premium support*	» 3 hours for 6 months subscription » 6 hours for 12 months subscription	✓	✓
Storage			
	Object Storage for results	3 TB	5 TB
	HDD Storage for pre-processing	3 TB	5 TB
Computing resources			
	vCPU	8	16
	RAM	64 GB	128 GB
	Root disk	256 GB	384 GB
Pricing (without VAT)			
	6 months subscription period	€ 2.784,00 (monthly: € 464,00)	€ 4.746,00 (monthly: € 791,00)
	12 months subscription period	€ 4.740,00 (monthly: € 395,00)	€ 7.860,00 (monthly: € 655,00)

* Premium support

The premium support provides access to solution and satellite data specialists and software engineers. It includes:

- » Consulting on the Sen4CAP as a Service solution
- » Assistance in configuring Sen4CAP processing environment
- » Individual on-line training

Please contact us for more details: sen4cap@cloudferro.com. Our experts will be happy to discuss your project needs.

CloudFerro provides **cutting-edge cloud services**. The company delivers and operates cloud computing platforms for demanding markets, such as the European space sector, climate research and science. Its broad experience and in-depth expertise include storing and processing **big data sets**, such as multipetabyte repositories of Earth Observation satellite data.

The offered cloud solutions are cost-effective, open-source-based, **flexible cloud solutions in a public, private or hybrid model**, customized to meet user needs. An extensive range of ancillary services and dedicated technical support are provided by the **highly experienced local team of IT specialists** with unmatched competences.

CloudFerro has been trusted by **leading European firms and scientific institutions** from various big-data-processing market sectors, including the European Space Agency (ESA), EUMETSAT, the European Centre for Medium-Range Weather Forecasts (ECMWF), Mercator Ocean International, German Aerospace Centre (DLR).

Contacts:

If you have any questions, please contact us at sales@cloudferro.com

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