OKTAL Synthetic **Environment**

Training catalog

2017-2018

OKTAL-SE is a French company specialized in electro-optical and radio frequency sensor rendering simulation software. Our experts have been working for more than 25 years in the sensor simulation field and each year we offer a large number of training courses in France and abroad. This document presents the range of training courses we provide to satisfy the learning requirements of engineers in these fields of high technology.

The standard modules we offer, both on our premises and in company, cover the following fields:

- ❖ **Module 1 :** EO/IR 3D scene generation (SE-Workbench-EO)

- ❖ **Module 2 :** Electro-magnetic 3D scene generation (SE-Workbench-RF)

- ❖ **Module 3 :** GNSS performance assessment in urban environments (SE-Workbench-GNSS)

- ❖ **Module 4 :** Geo-typical 3D database creation (SE-AGETIM-LIGHT)

- ❖ **Module 5 :** Geo-specific 3D database creation (SE-AGETIM)

Contact us:

OKTAL-SE Training Department
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31320 Vigoulet-Auzil,
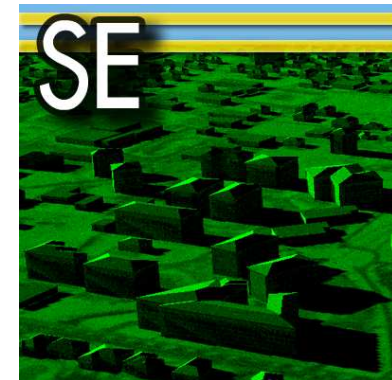Mél : training@oktal-se.fr
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Module 1 : EO/IR 3D Scene Generation (SE-WORKBENCH-EO)

Outcomes: You will acquire the knowledge of the theoretical methods and of the simulation tools to carry out the entire process and calculation of 3D visible and infrared synthetic environment rendering. This course covers at the same time atmospherical characterisation, definition of the equipment's electro-optical attributes, creation of a synthetic environment and a simulation scenario as well as sensor effect modeling. This training course may be followed up with a specific session on integrating special effects such as countermeasures, gas turbine exhaust plumes, sea conditions…

Content:

- ❖ Physical attributes
- ❖ Integration of atmospherical conditions and thermal calculations
- ❖ Scenario creation
- ❖ High fidelity EO/IR scene generation
- ❖ Real-time EO/IR scene generation
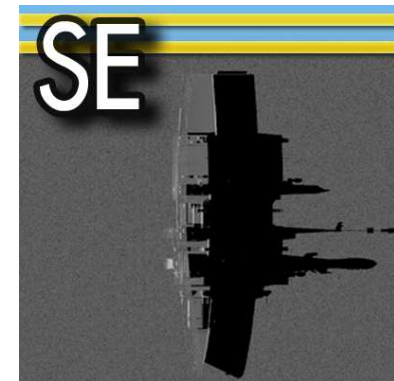- ❖ Sensor effects
- ❖ Integration in a host application

Duration	Audience	Prerequisites	In Company Courses	Public Courses(*)
4 days	Current customers and future users of OKTAL-SE EO/IR products	• Physical optics • Terrain modeling (GIS) • Programming skills (C++, Python,…)	**Customer site** 5600 Euros excl.VAT. + travel expenses (Max 6 trainees) **OKTAL-SE premises** 2800 Euros excl. VAT/pers. (Max 2 trainees)	**OKTAL-SE premises** 1600 Euros excl. VAT/pers 4-7 December 2017 12-15 March 2018*(*)* *(*) : cf general terms and conditions*

Module 2 : Electro-magnetic 3D Scene Generation (SE-Workbench-RF)

Outcomes: Whatever the final goal of the SE-Workbench-RF user, this training course is essential for integrating modeling skills when dealing with electromagnetic signals interacting with a 3D environment. Besides the theoretical approach, in particular in geometric optics and physical optics, this training session addresses the practical aspects of using the simulation tools to calculate RF signal propagation, a target radar cross section and SAR images.

Content:

- ❖ Physical models from the SE-RAY-EM kernel
- ❖ SDM data structure
- ❖ Creation, edition, setting of EM physical object attributes
- ❖ Geometrical optics and Physical optics
- ❖ Object roughness and Edges
- ❖ Complex object RCS calculation
- ❖ SAR image calculation

Duration	Audience	Prerequisites	In Company Courses	Public Courses(*)
3 days	Current customers and future users of OKTAL-SE RF products	• Physical principles of radar • 3D terrain generation. • Knowledge in 3D simulation Programming skills (C, C++,…)	**Customer site** 5600 Euros excl.VAT. + travel expenses (Max 6 trainees) **OKTAL-SE premises** 2800 Euros excl. VAT/pers. (Max 2 trainees)	**OKTAL-SE premises** 1600 Euros excl. VAT/pers 11-13 December 2017 19-21 March 2018*(*)* *(*) : cf general terms and conditions*

Module 3: GNSS Performance Assessment in Urban Environments (SE-NAV)

Outcomes : This training course is dedicated to satellite navigation and the issues of masking and multi-trajectories during GNSS signal propagation in constrained environments. We will explain how the ray tracing technique combined with the Geometrical Optics Theory and the Uniform Diffraction Theory can be effective for simulating the influence of multi trajectories on the system's performance.

Content :

- ❖ Theoretical presentation on satellite navigation
- ❖ Synthetic environment creation adapted to the simulation
- ❖ SE-NAV trajectory scenario creation. Results analysis on ScilabTM.
- ❖ SE-NAV cartography scenario creation.
- ❖ Impact of change in configuration on the DOPs, PVT, Visibilities…
- ❖ 3D LOS and NLOS masking calculation
- ❖ Development of a Client enabling SE-NAV to be included in a SW/HW loop.

Duration	Audience	Prerequisites	In Company Courses	Public Courses(*)
2 days	Current customers and future users of OKTAL-SE GNSS products	• Physical principles of EM • 3D terrain generation • Knowledge in simulation • Connaissance en programmation (C, C++,…)	**Customer site** 2800 Euros excl.VAT + travel expenses (Max 6 trainees) **OKTAL-SE premises** 1400 Euros excl. VAT/pers. (Max 2 trainees)	**OKTAL-SE premises** 800 Euros excl. VAT/pers 14-15 December 2017 22-23 March 2018 (*) *(*) : cf general terms and conditions*

Module 4 : Geotypical 3D Database Creation (SE-AGETIM-LIGHT)

Outcomes : Creating a 3D database is the essential element for all synthetic environment sensor rendering be it in an electro optical or an electromagnetic domain. This training course teaches you how to manage the geographical input data, to correct errors, define 3D creation rules (buildings, forests,…) and to create a realistic database.

Content :

- ❖ Basic knowledge in geographical information systems (Global Mapper®)
- ❖ 3D terrain construction parameter management
- ❖ Geotypical parameter management with Global Mapper®
- ❖ 3D database creation

Duration	Audience	Prerequisites	In Company Courses	Public Courses(*)
2 days	Current customers and future OKTAL-SE product users	• Basic knowledge of geographical information systems	**Customer site** 2800 Euros excl.VAT + travel expenses (Max 6 trainees) **OKTAL-SE premises** 1400 Euros excl. VAT (Max 2 trainees)	**OKTAL-SE premises** 800 Euros excl. VAT/pers 18-19 December 2017 15-16 March 2018 (*) *(*) cf general terms and conditions*

Module 5 : Geo-specific 3D Database Creation (SE-AGETIM)

Outcomes : The entire creation of a 3D environment including geospecific zones which require great experience and knowledge of the tools and modeling methods. During this training course you will explore all the different stages of creating a database. The initial steps of handling, modifying and validating geographical data will be covered in addition to geospecific zone creation through to terrain generation and all the necessary elements to calculate the sensor rendering.

Content:
❖ Geographical information system 3D model format and data management
❖ Presentation of GeoConcept®
❖ Import, modification and validation of existing data
❖ Model and template creation
❖ Geo-specific parameter management with GeoConcept®
❖ Customization of a 3D database according to the final application
❖ Terrain creation

Duration	Audience	Prerequisites	In Company Courses	Public Courses(*)
10 days in one or two sessions	Current customers and future users of OKTAL-SE products	• Basic knowledge of geographical information systems	**OKTAL-SE premises** 7000 Euros excl. VAT./pers. (Max 2 trainees)	**OKTAL-SE premises** 4000 Euros excl. VAT./pers Dates: contact us (*) *(*) cf general terms and conditions*

General Terms and Conditions

In Company Courses

These training sessions, unless otherwise stated, take place either on the customer's site (in which case, training staff travel expenses are additional) or on the OKTAL-SE premises (Vigoulet-Auzil, 31, France). Dates are arranged in accordance with the customer. When a training course takes place on the OKTAL-SE premises, local travel expenses (hotel ↔ OKTAL-SE) and lunch are included in the fee. These courses are reserved for companies whose requirements can be dealt with individually in case of specific applications. These cases of specific applications may be discussed with the training team up to one month before the scheduled date of the training course. Upon customer request, these training courses may be carried out in either French or English.

Public Courses

These training sessions take place on the OKTAL-SE premises (Vigoulet-Auzil, 31, France) on given dates (cf details of each module). Confirmation of the course (which needs at least 4 attendees in order for it to be held) will be given one month before the scheduled date by OKTAL-SE. As the number of places is limited, OKTAL-SE may be required to schedule new dates in addition to the initial courses. Several companies may attend these courses. According to the attendees' nationality, these sessions may be provided in English. Local travel expenses (hotel ↔ OKTAL-SE) and lunch are included in the fee.

Adapted Training

Upon request and after consultation with the customer, OKTAL-SE is able to customize its training courses so as to cover particular products and applications. OKTAL-SE has developed specific tools to fit the evolving requirements in the simulation world (for example plume modeling, state of the sea's surface, countermeasures…). A training programme and quotation can be provided for approval. These are In Company courses. Please do not hesitate to contact the Training Department for a tailor made solution (training@oktal-se.fr)

For French organizations: OKTAL-SE is a training organisation declared under the N° 73.31.04159.31 at the préfet de la région Midi-Pyrénées, which enables the training courses provided by OKTAL-SE to be co-financed by the Organismes Paritaires Collecteurs Agréés (OPCA).