

ICS map server

- *Digital cartography*
- *Remote sensing*
- *2D and 3D cartographic data*
- *Satellite images*
- *Aerial photographs*
- *Geoconversion*
- *Geocoding*
- *Vector information*





ICS map server

ICS map server is a complete solution for the handling and the production of high quality digital cartographic images, Digital Elevation Models (DEM) and ground occupancy layers that can be used with ATDI radio planning software.

ICS map server allows the creation of data from various sources such as paper maps, satellite views and aerial images or the conversion of cartographic files in various formats.

ICS map server runs under Windows® and provides optimal quality and excellent precision for very large file sizes.

ICS map server features an automatic upgrade engine between the ATDI servers and the client's computer.



ATDI cartographic expertise

ATDI understands the constraints of time, pricing and quality when discussing cartographic data. In our 15 years of experience, we have accumulated a sizeable catalogue of existing worldwide cartographic data. That information is stored in our large scale servers. Portions of this information, used for radio planning, are available as a free service on our website: www.atdi.com. For further information, please contact us on the web or at the address listed on the back of this brochure.

System integration

In addition to providing our customers with quality cartographic data in a timely and affordable fashion, ATDI will also help you to organize your network. Our team of professionals will assess your needs and customize a network that would best suit your business.

ATDI proposes solutions for operators who face challenges in the networking, sharing and managing of large amounts of cartographic data.

Sourcing of existing data

ATDI's skilled professionals have accrued extensive experience in the sourcing of existing cartographic data. Using our partnerships with industry leaders and government agencies around the world, ATDI is able to quickly identify existing data sets and ensure their quality.

Acquiring data

Once ATDI has confirmed the quality of the data, its acquisition is swift. The aerial photos, ground control points, satellite images and maps are then processed and formatted for the customers.

Production

In addition to providing the software used to create the digital images and layers needed for radio planning, ATDI also has impressive production capabilities. Our cartographic department manages a large high resolution laboratory, with extensive production capabilities in digital stereo restitution and high resolution digitizing.

All planning and modelling begin with the set-up and use of appropriate cartographic data. ATDI is able to provide adequate data for every planning and modelling task across the world. This capability extends to geo-marketing data such as population databases, zip code databases and other demographic and morphological information.



Importing

ICS map server imports and handles existing cartographic data. This can be done from most standard formats for terrain, images and vector data. Also, ICS map server allows the user to process the imported data via a method for the production of layers to be used for radio planning.

Geocoding

The process of geocoding allows you to project a raw layer into a cartographic grid with a known step and origin. The resulting layer can be accessed through its cartographic coordinates. Geocoded images are easy to tile and assemble.

DEM Extraction

ICS map server is optimized for production of DTMs or DSMs, using powerful algorithms for extracting the X, Y, Z information from an existing database (contour extraction, automatic correlation...).



From topographic maps, the contours are extracted automatically using convolution and line tracking algorithms or

manually with the mouse directly on the displayed map. The extracted contours can be displayed, modified, corrected using an extensive set of tools.

Orthorectification

ICS map server allows digitalization of map features directly from aerial photographs in order to collect accurate measurements from aerial photos. If needed, it is possible to remove geometric distortions caused by camera tilt and variations in the underlying terrain. True orthorectification uses a high resolution DEM, containing an urban scene to pitch the facades of the buildings vertically, thus creating an orthogonal projection from a radial projection. Without this process, antennas placed at specific coordinates may appear on the buildings facade instead of on the roof.



Oblique view with relief deformation



Vertical view with relief deformation

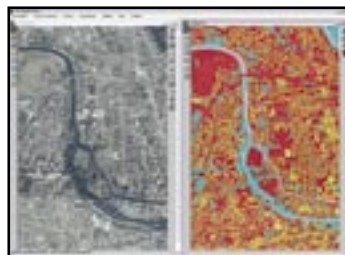


Orthography

Geoconversion

A file previously geocoded to a certain geographical grid can be easily geo-converted into another grid. Over 100 grid codes are implemented in ICS map server and transforming one to another is a feature provided with the software.

Restitution of clutter



ICS map server is optimized for the creation of clutter files. It is able to describe the topographical properties of the ground (vegetation, buildings, growth...). The extraction of such data can be automatically processed (remote sensing

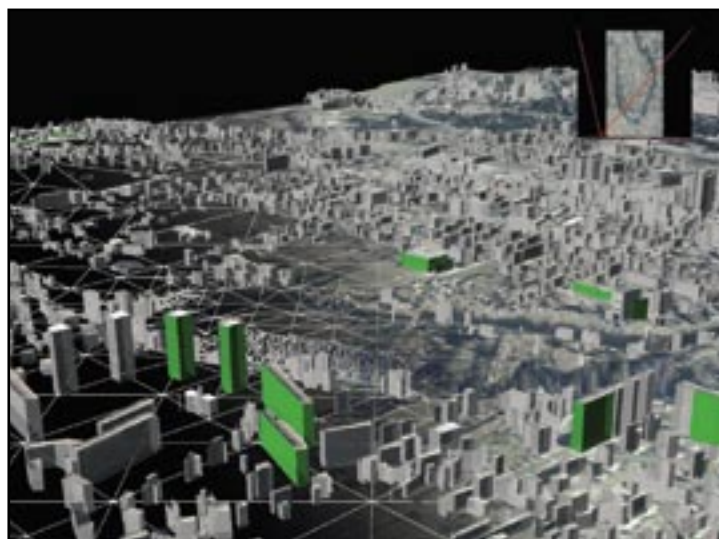
on multi-spectral satellite imagery), manually processed or imported from GIS/vector data.

Distribution of data through a network

ICS map server is capable of networking cartographic data. Many departments can access the same information simultaneously. Huge databases of images, DEMs and clutters can be remotely extracted, tiled, overlaid and prepared for radio planning.

New building layer

One unique feature in ICS map server is its ability to generate building height files. This layer is essential to the planning of urban networks or for detailed terrain analysis. The layer that contains building heights is added to the standard terrain layer in order to produce a composite DTM. Buildings are therefore integral part of the terrain database. Such files can be created from a standard high resolution DEM and the extraction of the building outline or from external sources such as photogrammetry. Usually, the accuracy of such files is better than 5 meters. ICS map server manages files down to one centimetre accuracy.



View of a building layer



Cartographic solutions

International/National planning pack

The national scale is a 100 % FREE mapping solution that can be downloaded from ATDI's website, www.atdi.com. The user inputs the coordinates of a central spot, for example the location of a transmitting station, and gets 100 km x 100 km composed of a standard map and the associated DEM at 500 m accuracy (100 m in the US). All this information is copyright free.

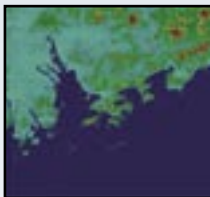
Such cartographic datasets are dedicated to quick checks that do not require a high level accuracy, such as rough evaluation of FM and TV coverage, identification of potentially large obstacles along the path of long haul microwave links.

Content:

- Geocoded map at 100m resolution (aeronautical chart) UTM projection, WGS84



- Digital Terrain Model at 500m resolution (100m in the U.S.) UTM projection WGS84



Mapping for free
www.atdi.com

National/Regional planning pack

ATDI provides upon request same information as the free pack, but for larger areas at a very affordable price. The accuracy is adapted to the needs of the customer and the project at hand. This dataset is designed to provide the maximum amount of detailed geographic information for regional areas, in order to provide the radio-planner with cartographic data that best suits the technology to simulate.

The medium resolution dataset is dedicated to large scale radio-planning : radio-planning of broadcast networks, cellular networks in rural environments, network dimensioning of NLOS technologies.

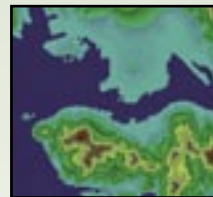
This pack is available for a minimum of 10,000 km² up to an entire province or country. Please, contact our cartography department at mapping@atdi.com.

Content:

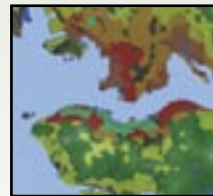
- Image
- georeferenced topographic map or satellite image, from 10 m to 100 m accuracy



- High resolution DEM
- source - stereo photogrammetry
- resolution -1 m
- accuracy - XY 2 m, Z 1 m



- Clutter - up to 20 land uses per map



Urban planning pack

If you have planned to work over a city area, this package provides you with the high resolution imagery, DTM, building layer, clutter files and associated geomarketing information that you need.

The metric resolution is dedicated to radio-planning of cellular networks (PMR, GSM, UMTS) in urban environments, point-to-point links and point-to-multipoint systems such as LMDS, WiMAX, DVB-T, DVB-H, WLL...

It allows an accurate positioning of subscribers, detailed coverage and interference analysis.

This type of cartographic dataset permits the deterministic analysis of building obstruction (canyon effect), reflections on building walls as well as outdoor to the indoor (diffusion) effect.

Content:

- True orthophoto
- source - stereo photogrammetry
- resolution - 0.5 m
- accuracy - 2 m



- High resolution DEM
- source - stereo photogrammetry
- resolution -1 m
- accuracy - XY 2 m, Z 1 m



- Clutter file (raster & vector format)
- Address file (geomarketing data)



- Building file
- source - stereo photogrammetry
- resolution -1 m
- accuracy - XY 2 m, Z 1 m



Cartographic layers

Digital Elevation Models

DTM/DEM/DSM files can be imported, exported, produced and manipulated. This includes :

- 3D DTM created by interpolation of contour lines extracted from topographic maps;
- Canopy DSM showing the aggregate elevation of vegetation and large structures, such as freeway over-passes and suburban rooftops which can interfere with RF signal propagation;
- 3D building DEM mixing both terrain and building height information.

Vector data

ICS map server can create and display vector information over the cartographic data, which can be used to highlight information or specific areas. The polygon outlines of buildings are essential for many RF technologies, working in Line Of Sight, near Line Of Sight, or Non Line-Of-Sight. This information makes it possible to match addresses to rooftops and for a detailed geo-marketing analysis to be carried out in the planning tool.

Ground occupancy layer

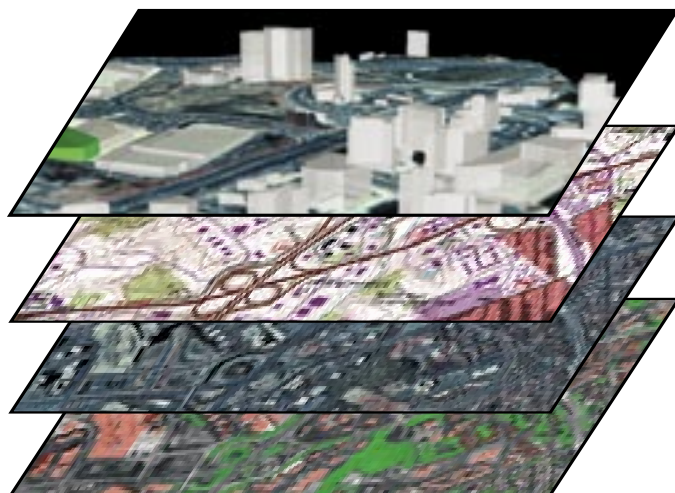
This layer, sometimes called the clutter layer, contains information on the terrain morphology such as structures, roads and vegetation. ICS map server features a brand new engine for the automatic extraction of clutter data from multi-spectral Landsat 7[®] imagery.

Raster imaging

ICS map server manipulates 256 colors raster images produced by a color scanner, or imported from other sources when available (TIFF, TGA, BMP). The resulting image can be exported for various applications. The images processed by geo-referencing can be used as GIS (Geographic Information System) support or for the generation of other cartographic layers.

Buiding layer

The building layer describes each building outline in high resolution and its height above ground level as well. Within the same radio-planning project, this file can be used to calculate the signal received over the building rooftops (for outdoor propagation) and the signal loss diffusion effect (for outdoor to indoor propagation).



Different cartographic layers handled by ICS map server



Credits: Nasa

SRTM : High quality and homogeneous data available for the whole world

In 2000, the American space shuttle completed a ten-day flight, during which a worldwide topographic survey was performed using the interferometric radar technique. The data obtained during this survey has been made generally available by NASA with a planimetric resolution of 3 arc seconds.

The post-processing done by ATDI generates medium resolution DTMs, fitting many cartographic needs :

- large areas covered (regional, national and international scale);
- reduced cost and delivery times;
- the technical specifications are homogeneous and clearly defined over the area of interest.

As SRTM data covers most of the earth with a single acquisition mode, its technical specifications are homogenous and clearly defined. This allows ATDI to perform a time-effective post-processing with ICS map server and guarantee constant technical specifications.

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Main features of ICS map server

1. File formats

1.1 Native file formats

- .IC1
- .IC2
- .PAL
- .DCW
- .IMG
- .GEO
- .SOL

1.2 External file formats

- 1.2.1 Imports
 - Targa 8 16 24
 - Planet
 - EDX[®]
 - Colortrac / Tangent
 - Uncompressed 8 bit TIFF
 - Uncompressed 24 bit TIFF
 - Uncompressed 24 bit / greyscale BMP
 - ASRP 1.0
 - ASRP 1.2
 - USRP 1.2
 - USRP 1.2-F
 - BILSpatioDef
 - Alchemy converter
 - Standard images
 - DTED
 - DEM
 - NTF
 - DSMM
- 1.2.2 Exports
 - Targa 8 16 24
 - Uncompressed 8 bit TIFF
 - Planet[®]
 - EDX[®]
 - DTED
 - RASTER / BIL
 - ASCII grid
- 1.2.3 Vector formats
 - Vector Product Format (VPF / VMAP)
 - DCW (Digital Chart of the World)
 - DFAD (clutter)
- 1.3 Size & resolution
 - 32000x32000 points, 2GB
 - Step >.0000001

- RSA

- Celltec
- DHM25
- Bd Alti
- Bil Intel
- Bil Unix
- Alcatel asc[®]
- ASCII Grid

1.4 Projections

- 1.4.1 Geographic
 - Decimal degrees
 - Seconds
 - Degree Minute Seconds
 - 107 supported datums
- 1.4.2 Cartographic
 - National grids (France, UK, Swiss, Finland, Malaysia...)
 - UTM north and south / all zones / all datums

2. Display

- 2.1 8 & 16 bits common features
 - Zoom
 - Status bar
 - Layout
- 2.2 8 bit specific features
 - Palette
- 2.3 16 bits specific features
 - Standard ref palette
 - Classified palette
 - 3D
- 3. 8 & 16 bit common functions
 - Geocoding
 - Geoconversion
 - No data cleaning
 - Tiling

- Cutting
- Resampling

4. 8 bit specific functions

- Palette editing
- Cleaning
- Transformations

5. 16 bit specific functions

- Data extraction (contour & clutter)
- Rasterising
- Quality checking and corrections

6. Requirements

- Windows 2000 SP4, XP SP2, 2003 SP1, Windows XP Professional x64 edition
- Processor Intel, AMD 2GHz or more, Intel Centrino 1,4 GHz
- 1 Gb of RAM or more (SDRAM or RDRAM)
- AGP graphic adapter with 32 Mb of RAM & 3D graphic accelerator (Direct X[®] + OpenGL[®])
- 40 Gb hard disk drive Ultra ATA, SATA or Ultra-wide SCSI
- 19 inches screen - Display resolution 1024 * 768 or 1280* 1024, with 65,536 colors or more
- CD/DVD ROM drive
- CD/DVD writer for backup