

HTZ new features V. 2022.12

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Propagation Models

Microwave link list - Radiocom. fixes (FH et PMP) / Fixed radiocom. (MW and PMP)

The distance of the path can now be displayed in the Microwave link list.

Diffraction geometry

- ☒ Deygout 94
- ☐ Deygout 66
- ☐ Deygout 91
- ☐ Bullington
- ☐ Delta Bullington
- ☐ ITU-R 526, round mask
- ☐ ITU-R 526, cylinders
- ☐ Visibility / Indoor
- ☐ No diffraction loss
- ☐ Lateral diffraction (UTD)
- ☐ Power correction (angle)
- ☐ VHF correction
- ☐ More methods...

Parameters & calculations

CALCULATIONS: TOOLS/Interference restrictions

The "From now" option has been added to the "Collision: start / end dates" mode.

When checked and, if the end date of the wanted station or the end date of the unwanted station are lower than the UTC current date (yyyymmdd), then no interference will be computed.

Interference rules

☐ Interference from/to activated stations (only)

☒ Wanted: all channels / Unwanted: all channels (C/I)

☐ Wanted: Pilot channel only / Unwanted: all channels (C/I)

☒ Collision: start / end dates

☒ From now

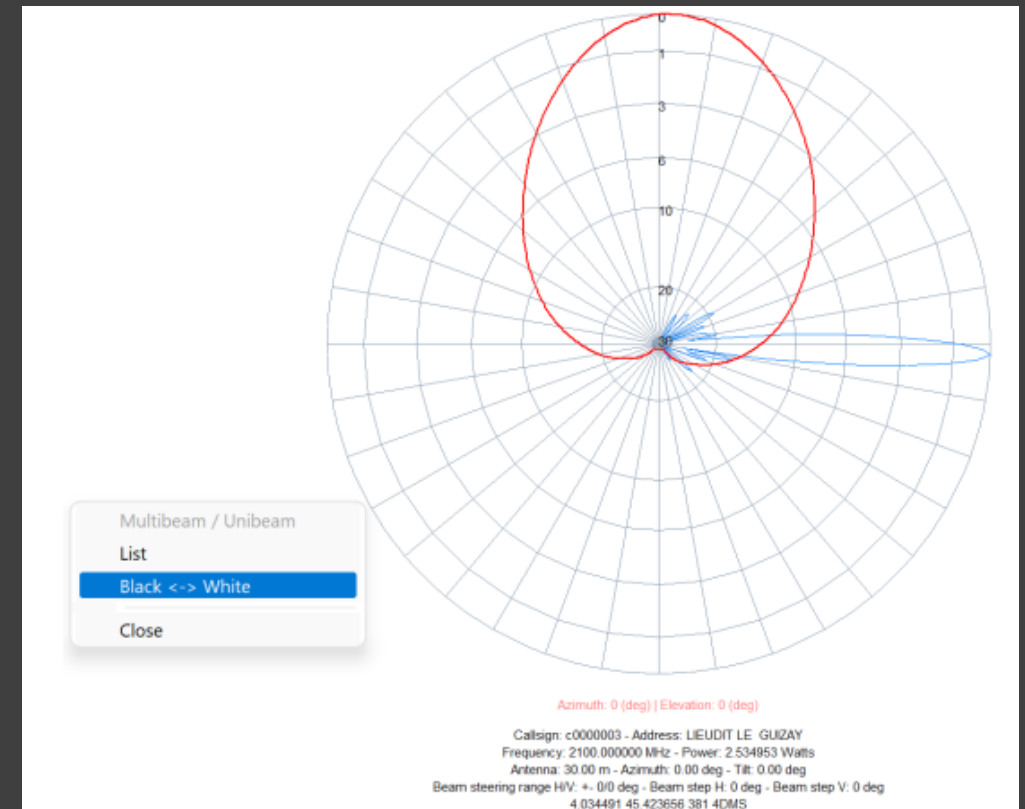
Wanted/Unwanted distance <= 10000.00 km

C/I and IRF correction if same Network ID 0 dB

C/I - correction, IRF + correction

CALCULATIONS: STATION PARAMETERS/Patterns tab

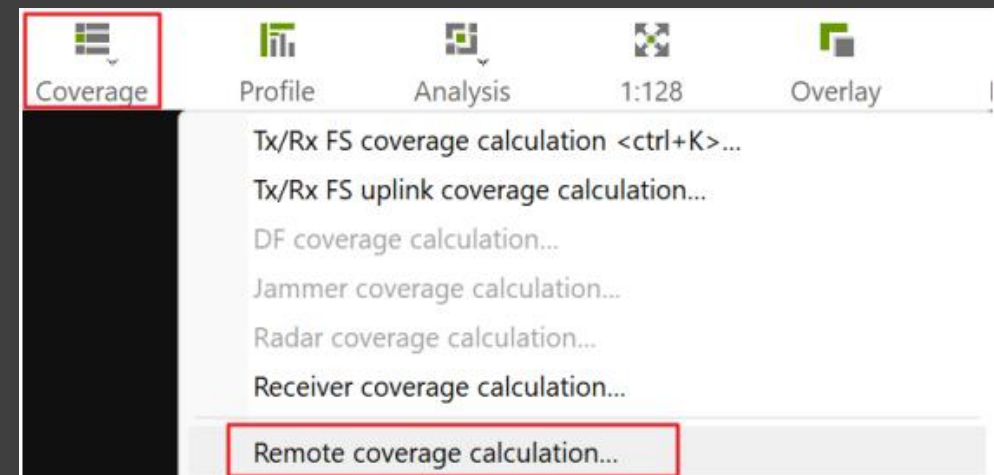
The "Black <-> White" option has been added to the "View" display. This switches the background colour between black and white the background color.



TOP BAR/COVERAGE BUTTON/ Remote coverage calculation

This feature opens multiple sessions of HTZ to compute coverage by groups of stations in parallel (limited by the number of available CORES or CPUs). Only activated stations on the map will be considered. It works like the "Remote simulation" feature from the station database and the number of parallel sessions (threads) is not limited by the number of CALs of the license.

The progression of the whole process has been added in the main session. Note: The main HTZ session is locked during this massive processing.



LOCALIZATION/Geolocation map AOA

In AOA mode, if the sensor measurement error NLOS is greater than the sensor measurement error LOS, the DF accuracy considered becomes:

DF accuracy (from DF parameter) + Sensor measurement error NLOS (m) / Sensor measurement error LOS (m)

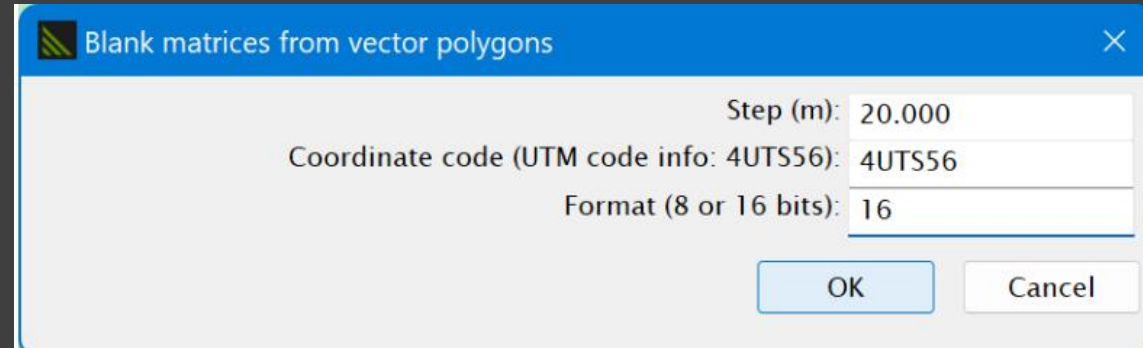
Sensor meas. error LOS (ns)	50.0	15.0 m
Sensor meas. error NLOS (ns)	200.0	60.0 m

GIS Data Support

RECTANGLE SELECTION/CREATE MATRIX/ Blank matrices from rectangles

This feature will create blank matrices from activated vector rectangles. Each matrix will be named with the "Comment" field of the corresponding vector.

Note: Each vector's rectangle "Comment" field must be populated.



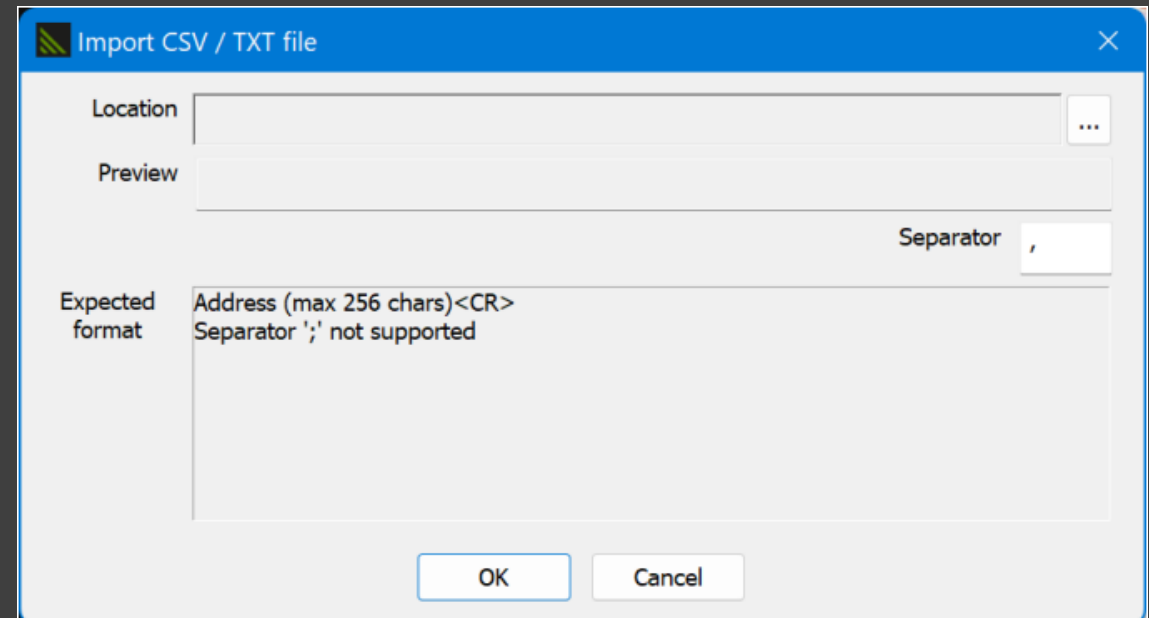
Step (m):	20.000
Coordinate code (UTM code info: 4UTS56):	4UTS56
Format (8 or 16 bits):	16

OK Cancel

MAP/VECTOR LAYER/ Create vector points from address file

This feature will create vector points from the address file and a report.

NB: A valid BIM key must be loaded in the project first, and the license used must be covered by a maintenance contract.



Import CSV / TXT file

Location ...

Preview

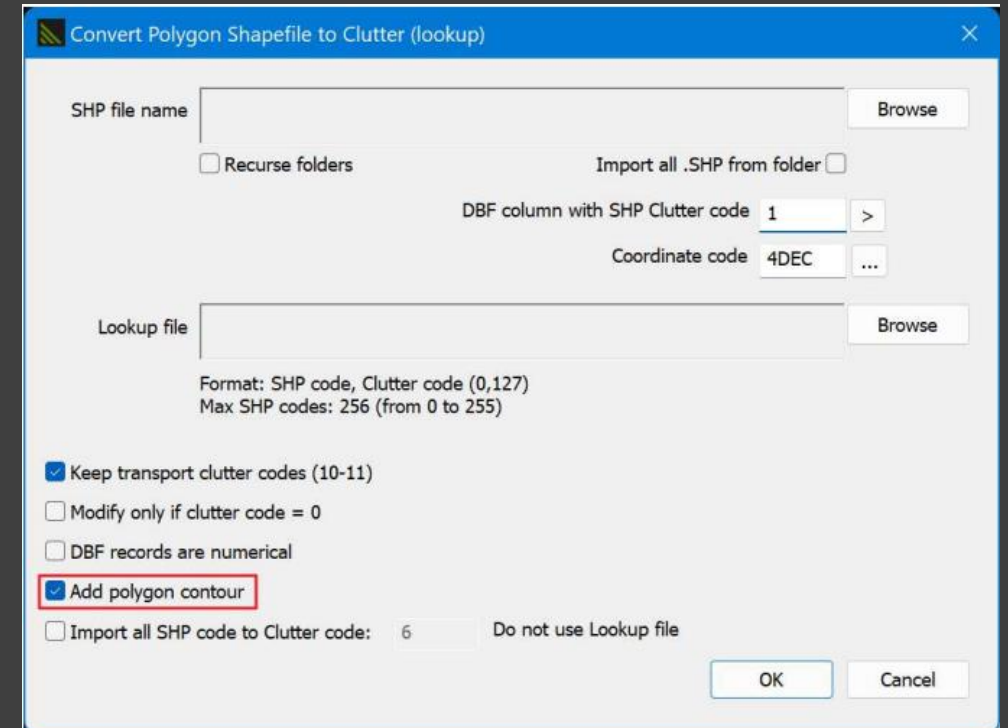
Expected format Address (max 256 chars)<CR>
Separator \';' not supported

Separator ,

OK Cancel

MAP/RASTER OPERATION/MODIFY CLUTTER/ SHP polygons (Lookup)

The "Add polygon contour" option has been added. If checked, the vector contour of the shape will also be filled.



Convert Polygon Shapefile to Clutter (lookup)

SHP file name Browse

☐ Recurse folders ☐ Import all .SHP from folder

DBF column with SHP Clutter code >

Coordinate code ...

Lookup file Browse

Format: SHP code, Clutter code (0,127)
Max SHP codes: 256 (from 0 to 255)

☒ Keep transport clutter codes (10-11)

☐ Modify only if clutter code = 0

☐ DBF records are numerical

☒ Add polygon contour

☐ Import all SHP code to Clutter code: Do not use Lookup file

OK Cancel

GIS Conversion – Improvement in LiDAR data conversion

1. MAP/RASTER OPERATION/GEOCODING/ XYZ – Lidar: direct import of LAS/LAZ files

☒ Fast import mode

☐ Format: X Y Z [C]<CR> or X;;Y;;Z;[C]<CR>

☐ Format: X Y Z [C] X Y Z or X,Y,Z,[C]... (memory)

☐ Format: X Y Z [C] binary (.PTCx)

☐ Use PTCx Z-unit and projection code

☒ Format: LAZ/LAS

2. MAP/Map data converter: "Fast mode" option has been added to the conversion from LAS or LAZ lidar files to PTCx files. The conversion process is 10 times faster when used.

Miscellaneous

Check ICx file headers... Modify ICx header... Create UTM folders...

LAZ/LAS->XYZ... LAZ/LAS to PTCx... XYZ to PTCx...

Update PTCx headers...

Binary XYZ files. Use default coordinate code.
Terrain data and metadata located in same folder

PTX header

Coordinate code: 4DEC

Elevation unit: feet=1, meter=0 (0/1) 0

Replace existing PTCx files = 1 (0/1) 0

Fast mode = 1 (0/1) 1

OK Cancel

TOOLS/Cartographic conversion – New Grids added

1. The "Canada Lambert NAD83 (Statistic Canada Lambert)" projection system has been added (SCL grid code / EPSG: 3347).

Grid OUT

Code Out

Coordinate System	Datum
Canada Albers Equal Area	Srbija Bessel Datum
Canada Lambert NAD83 (Statistic Canada Lambert)	Sweden Reference Datum - SWEREF 99
Canada Yukon Albers - NAD83	Sweden RR 92 datum for RT90
China Lambert	Tananarive Observatory '25

2. The "GRIB global" projection system (NOAA) has been added (GRB grid code).

Grid OUT

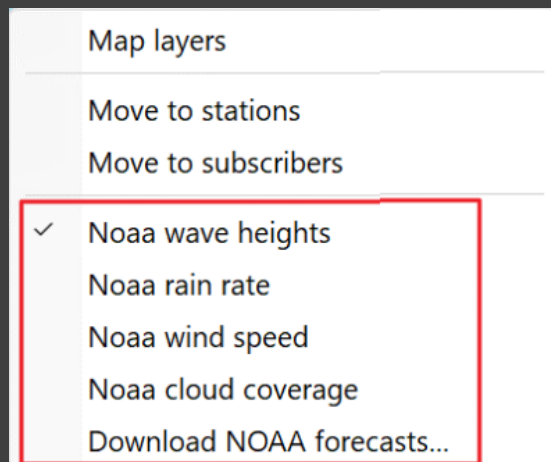
Code Out

Coordinate System	Datum
Germany - Gauss Kruger (3° zones)	Srbija Bessel Datum
Ghana / Leigon Metre Grid	Sweden Reference Datum - SWEREF 99
Google/Bing - Web Mercator Auxillary Sphere	Sweden RR 92 datum for RT90
Greece - EGSA 87	Tananarive Observatory '25
Greece - UTM central meridian = 24° (ED50)	Thai/Viet (Indian)
GRIB global	Timbalai 1948
Hong-Kong 1980	Tokyo - Korea
Hungary / HD72-EOV	Tokyo mean
Iceland - Hjorsey 55	Tristan Astro 1968
Iceland - ISN93	Unites Arab Emirates (Nahrwan)
India Grid (zone 0)	Viti Levu 1916
India Grid (zone IA)	Wake-Eniwetok '60
India Grid (zone IB)	WGS-72
India Grid (zone IIA)	WGS-84
India Grid (zone IIB)	

NOAA Display

The maps displaying National Oceanic and Atmospheric Administration (NOAA) KPIs have been added to the Slider with an option to download the NOAA latest forecasts.

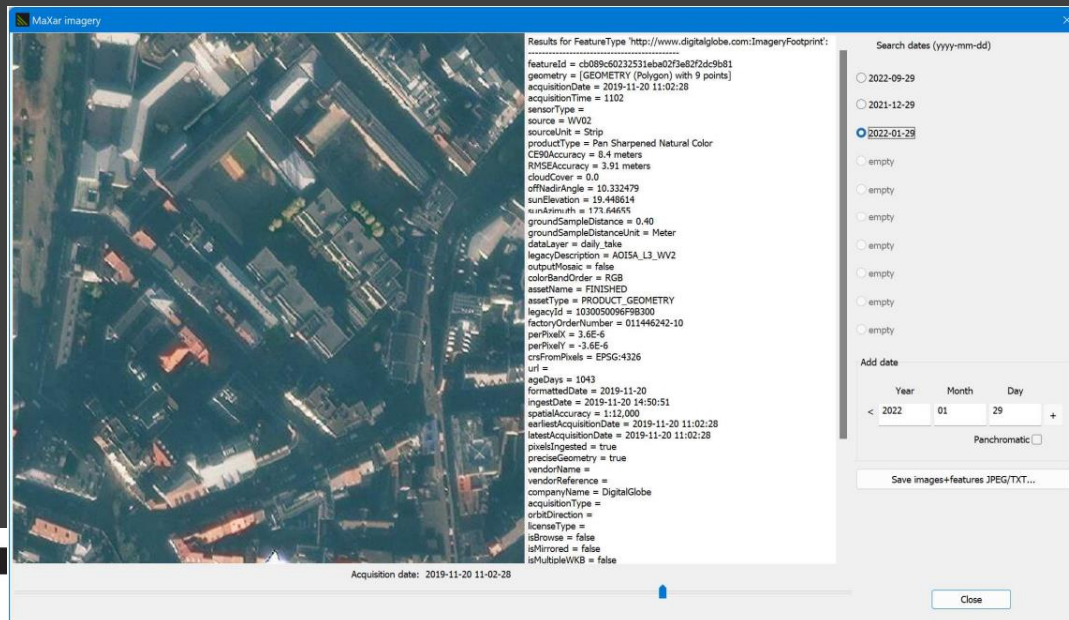
RIGHT CLICK ON MAP/MaXar <F8>... <F8> key



(HTZ Warfare Only) MAXAR Satellite Image Layer enhancement

1. RIGHT CLICK ON MAP/MaXar <F8>... <F8> key

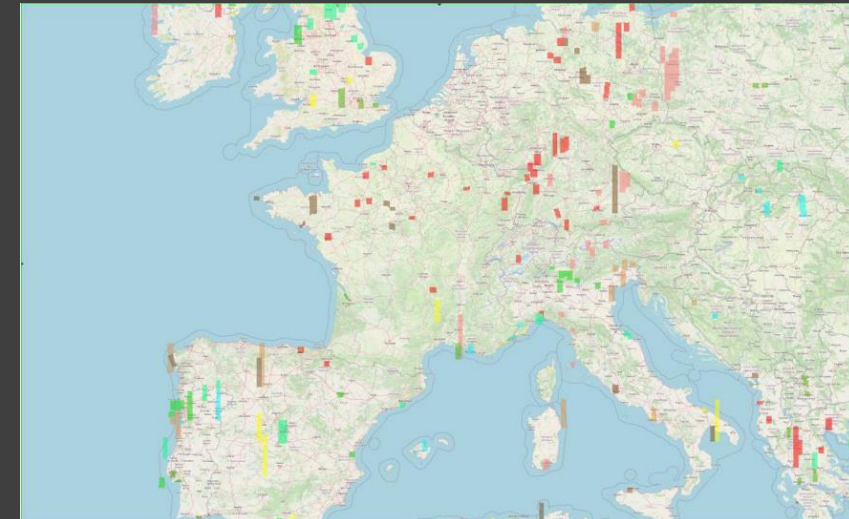
This opens the MaXar map selector displaying associated metadata



2. SHORT BUTTON/MaXar image footprints 12 days

This displays the latest MaXar image footprints created during the last 12 days. Before starting the process, an option is offered to download the latest dataset. If not selected, the latest dataset downloaded will be used. The results displayed on the map is a raster map giving the number of days since the last acquisition. The current date is the reference.

Note: When running this feature for the first time, the download is required to get a result.



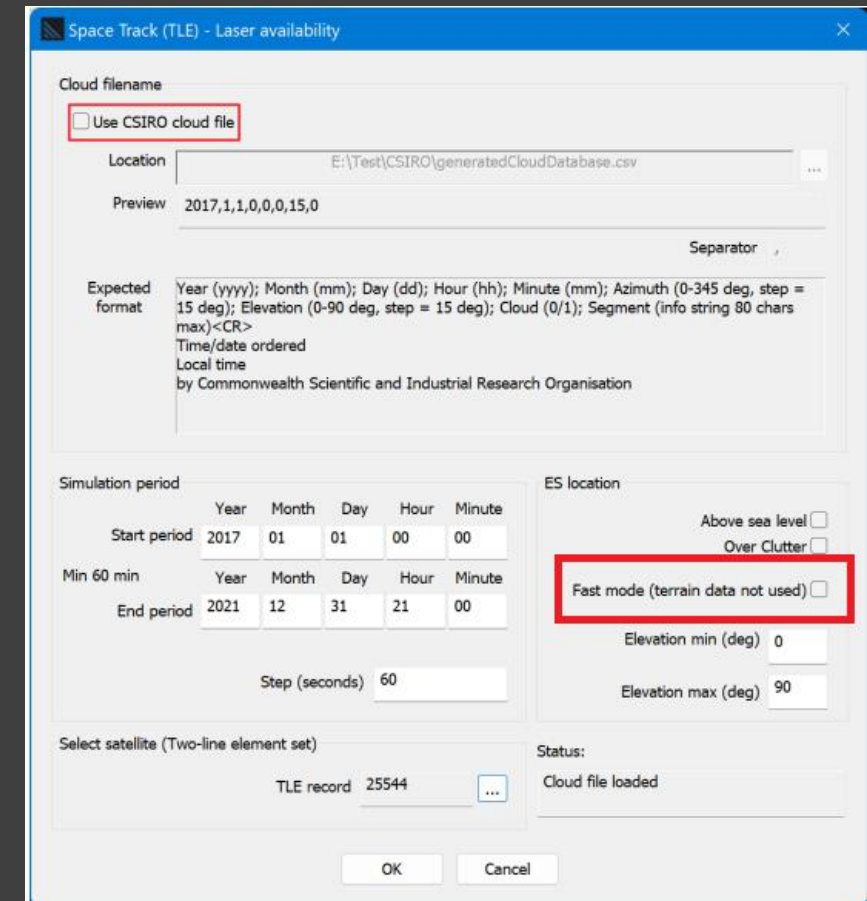
Satellites

STATION POPUP MENU/POINT TO POINT/ TLE laser availability

This feature computes the statistics of the availability of the link between the considered station on the map and the selected TLE satellite.

The calculations consider the potential presence of clouds crossed by each link. More info in the document:

<http://data.atdi-group.com/doc/789.pdf>.



Space Track (TLE) - Laser availability

Cloud filename

☐ Use CSIRO cloud file

Location: E:\Test\CSIRO\generatedCloudDatabase.csv

Preview: 2017,1,1,0,0,15,0

Separator: ,

Expected format: Year (yyyy); Month (mm); Day (dd); Hour (hh); Minute (mm); Azimuth (0-345 deg, step = 15 deg); Elevation (0-90 deg, step = 15 deg); Cloud (0/1); Segment (info string 80 chars max)<CR>
Time/date ordered
Local time
by Commonwealth Scientific and Industrial Research Organisation

Simulation period

	Year	Month	Day	Hour	Minute
Start period	2017	01	01	00	00
Min 60 min					
End period	2021	12	31	21	00

Step (seconds): 60

ES location

Above sea level ☐

Over Clutter ☐

☐ Fast mode (terrain data not used)

Elevation min (deg): 0

Elevation max (deg): 90

Select satellite (Two-line element set)

TLE record: 25544

Status: Cloud file loaded

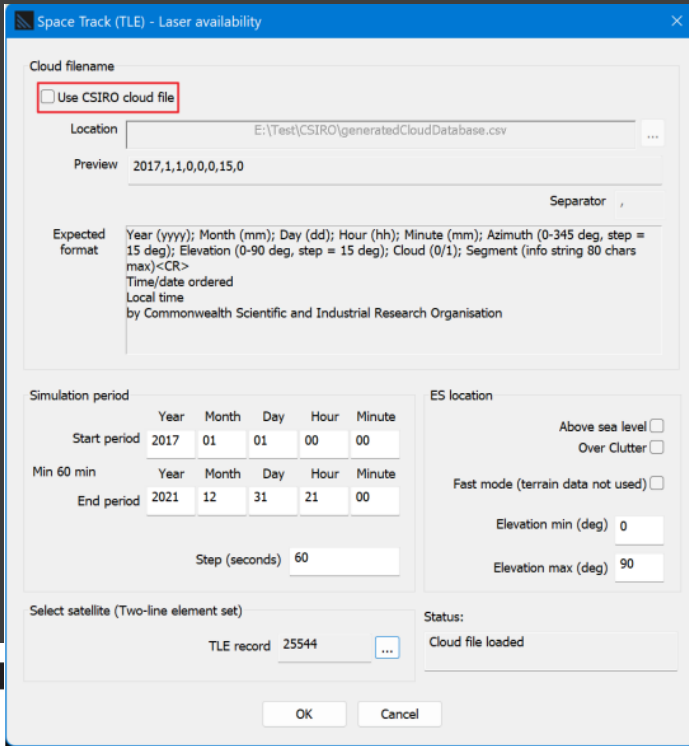
OK Cancel

STATION POPUP MENU/POINT TO POINT/TLE laser availability

In this feature, the cloud file is now optional.
More info in document: <http://data.atdi-group.com/doc/789.pdf>.

The analysis can now be limited to a given range of azimuths (from min to max) around the selected Earth station.

Note: A sampling of the Cloud file of 3 hours is now considered (instead 1 hour)



Space Track (TLE) - Laser availability

Cloud filename

☐ Use CSIRO cloud file

Location: E:\Test\CSIRO\generatedCloudDatabase.csv

Preview: 2017,1,1,0,0,15,0

Separator: ,

Expected format: Year (yyyy); Month (mm); Day (dd); Hour (hh); Minute (mm); Azimuth (0-345 deg, step = 15 deg); Elevation (0-90 deg, step = 15 deg); Cloud (0/1); Segment (info string 80 chars max)<CR> Time/date ordered Local time by Commonwealth Scientific and Industrial Research Organisation

Simulation period

	Year	Month	Day	Hour	Minute
Start period	2017	01	01	00	00
Min 60 min					
End period	2021	12	31	21	00

Step (seconds): 60

ES location

☐ Above sea level

☐ Over Clutter

☐ Fast mode (terrain data not used)

Elevation min (deg): 0

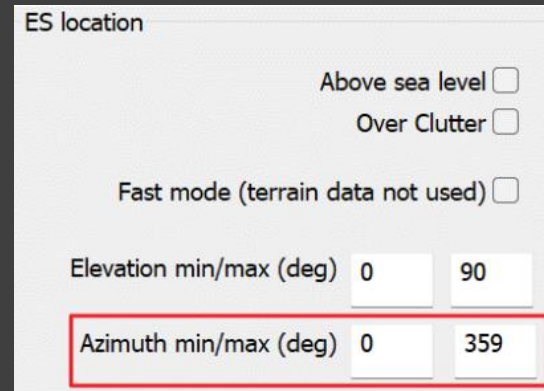
Elevation max (deg): 90

Select satellite (Two-line element set)

TLE record: 25544

Status: Cloud file loaded

OK Cancel



ES location

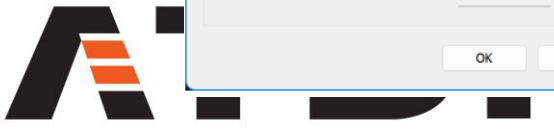
☐ Above sea level

☐ Over Clutter

☐ Fast mode (terrain data not used)

Elevation min/max (deg): 0 90

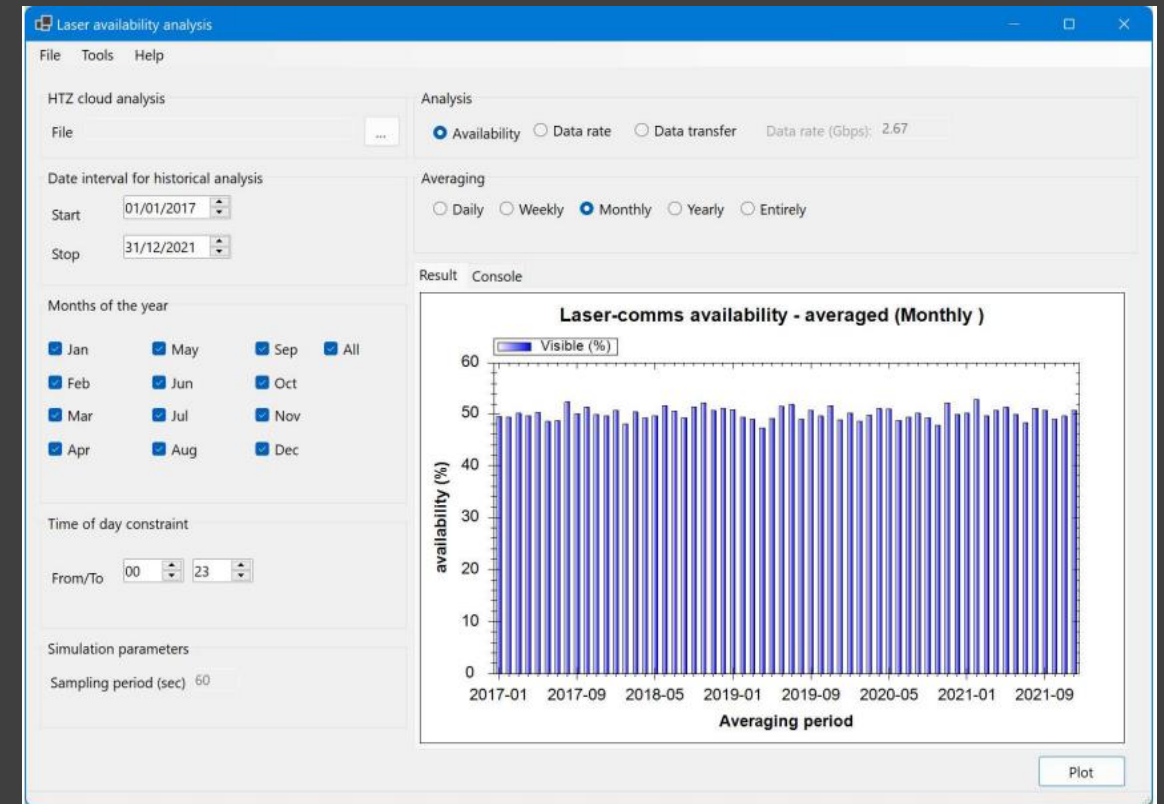
Azimuth min/max (deg): 0 359



STATION POPUP MENU/POINT TO POINT/TLE laser availability

Once the calculation is complete, the program "LaserLinkAvailability.exe" is called.

This program must be in the main installation folder of HTZ. It generates results according to CSIRO specifications (<https://www.csiro.au/>).



Microwave

Microwave link list - Radiocom. fixes (FH et PMP) / Fixed radiocom (MW and PMP)

The distance of the path can now be displayed in the Microwave link list. The distance of the path has been added to the CSV report.

Microwave link list

Record	Ident	Site A #	Site B #	Direction	Address A	Address B	Frequency A	Frequency B	Switch	Group	Distance m
1	Link 1	1	2	bi					activated		1101.68
2	Link 2	3	4	bi					activated		1065.52
3	Link 3	5	6	bi					activated		967.40
4	Link 4	7	8	bi					activated		590.34

MW column display

☒ Address
 ☐ Info (1)

☒ Frequency (MHz)
 ☐ Info (2)

☒ Status
 ☐ Network ID

☐ Polarization
 ☐ Site code

☐ Mode
 ☐ User

☒ Group code
 ☐ BW kHz

☐ KTBF
 ☐ Frequency plan

☐ Modulation
 ☐ Channel

☒ Distance (m)

Close

4

Double click or Right click for options

Refresh

Goto

Activated: 4

De-activated: 0

Ghost:

Interference calculation (selected MW)

Wanted

Unwanted

☒ vs on map stations
 ☐ vs DB MW...

Wanted / Unwanted

Activate

Deactivate

Isolate

Mask

Hide / Reveal

Del deactivated

Transport

Change...

List

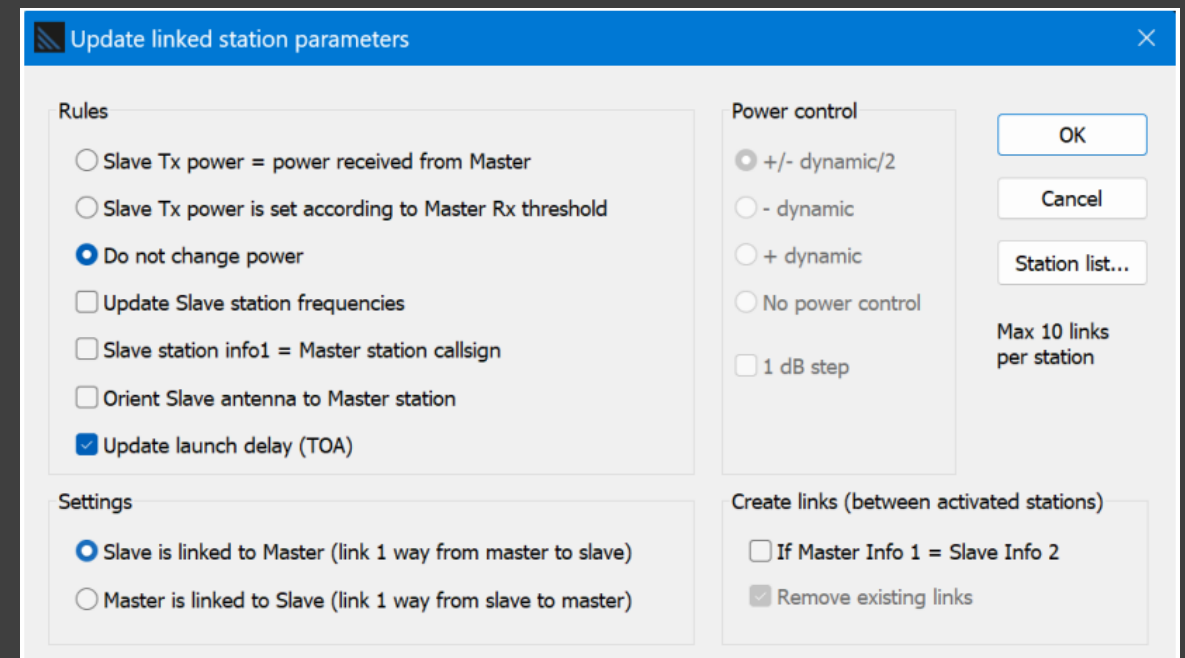
Close

MULTIPOINT/Linked station parameters - Radiocom. fixes (FH et PMP) / Fixed radiocom (MW and PMP)

The "Update launch delay (TOA)" option has been added. If checked, the "Launch delay" parameter of the Slave station(s) will be updated as follows:

Slave station launch delay = Master station launch delay + Propagation delay from Master to Slave.

Note: Use uni-directional links between the Master and the Slave stations.



Update linked station parameters

Rules

- ☐ Slave Tx power = power received from Master
- ☐ Slave Tx power is set according to Master Rx threshold
- ☒ Do not change power
- ☐ Update Slave station frequencies
- ☐ Slave station info1 = Master station callsign
- ☐ Orient Slave antenna to Master station
- ☒ Update launch delay (TOA)

Power control

- ☒ +/- dynamic/2
- ☐ - dynamic
- ☐ + dynamic
- ☐ No power control
- ☐ 1 dB step

Settings

- ☒ Slave is linked to Master (link 1 way from master to slave)
- ☐ Master is linked to Slave (link 1 way from slave to master)

Create links (between activated stations)

- ☐ If Master Info 1 = Slave Info 2
- ☒ Remove existing links

Max 10 links per station

OK Cancel Station list...

Broadcast

COVERAGE/NETWORK PLANNING/ SFN launch delay assignment

The "Support for linked Gap fillers (Master must be set as Pilot)" option has been added.

If checked, the launch delay of the Gap fillers won't be assigned but will be updated from the launch delay assigned to the Master station with:

Gap filler launch delay = Master station launch delay + Propagation delay from Master to Gap filler.

Gap fillers are identified by stations linked to the Master station which the first channel is defined as "Pilot".



Launch delay assignment (COFDM mode)

Action

☒ First server method

☐ Best server method

Guard interval (usec) 14 >

Usable symbol (usec) 448

Eq. interval Tp (usec) 130 + -

Max distance (km) 4.20

☐ No progressive destructive FS

☐ No constructive FS

Step 10 microsec

Rx gain 0.00 dB KTBf (1) -112 dBm

Margin 0 dB

Min C/N+I to achieve (dB) 15 >

Wanted threshold 39 ...

Synchro. threshold = threshold - margin
Wanted threshold = KTBf+C/N required

SFN = Activated Tx...

Method

☒ EBU formulas

☐ User masks

	ToA (Delta us)	% unwanted	% wanted	IRF (dB)
min	-40	100	0	20
	20	0	0	0
	10	70	0	0
	5	100	0	20
max	2	100	0	40

☐ User formula builder...

Rx ant discr

☒ none ☐ 419/GE ☐ OET69 ☐ user ...

☒ Global XPD 0 dB

☐ Vector polygon limited

☒ Support for linked Gap fillers (Master must be set as Pilot)

OK Cancel C/I...

(1) 0 = from station parameter KTBf

Only activated stations are taken into account

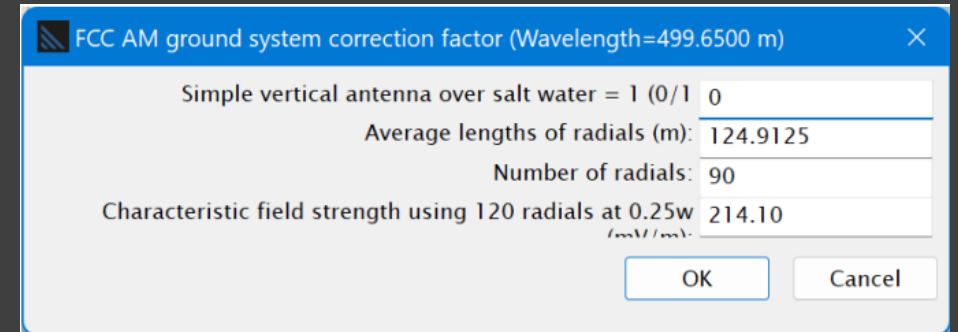
Clutter... C/I... Load... Save... Palette... Station list...

STATION PARAMETERS/General tab: Spectrum management

1. The "AM" button has been added (available only if the station frequency is lower than or equal to 30MHz). It will compute and update the "Tx add losses (dB)" parameter according to "AM Ground System Correction Factors" from FCC (<https://transition.fcc.gov/fcc-bin/fig8?ground-system-correction-factors>).

2. REGIONAL/ IT: DAB coordination

This feature will perform DAB coordination process according to AGCOM (Italy) rules considering national or international test points (text files).



FCC AM ground system correction factor (Wavelength=499.6500 m)

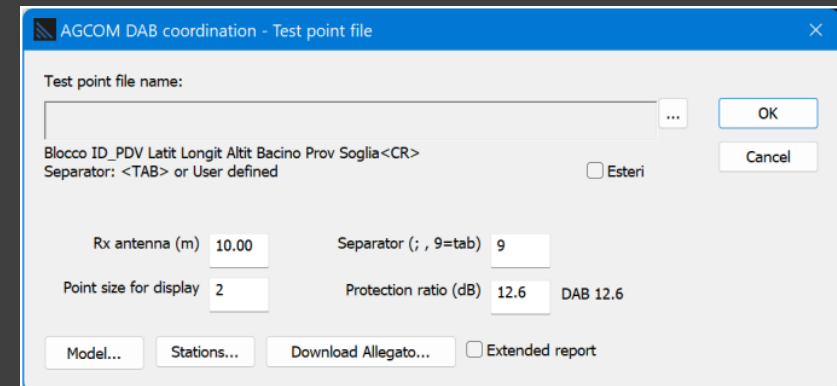
Simple vertical antenna over salt water = 1 (0/1) 0

Average lengths of radials (m): 124.9125

Number of radials: 90

Characteristic field strength using 120 radials at 0.25w (mV/m): 214.10

OK Cancel



AGCOM DAB coordination - Test point file

Test point file name: ... OK

Blocco ID_PDV Latit Longit Altit Bacino Prov Soglia<CR> Separator: <TAB> or User defined ☐ Esteri Cancel

Rx antenna (m) 10.00 Separator (; , 9=tab) 9

Point size for display 2 Protection ratio (dB) 12.6 DAB 12.6

Model... Stations... Download Allegato... ☐ Extended report

Spectrum MGT - Windfarm

Windfarm interference features – Spectrum Management

STATISTICS/COVERAGE MAP/ Virtual turbine exclusion area:

This feature will add a virtual wind turbine (with user defined parameters) on each point of the map around each transmitter and within a radius limited by "Limit distance (km) (WT->TR)". The radiation pattern of the WT can be:

- either extracted from Wind turbine parameters (Patterns tab);
- or considered as a Simple plane reflector;
- or built from ITU-R BT.1893-1 recommendation.

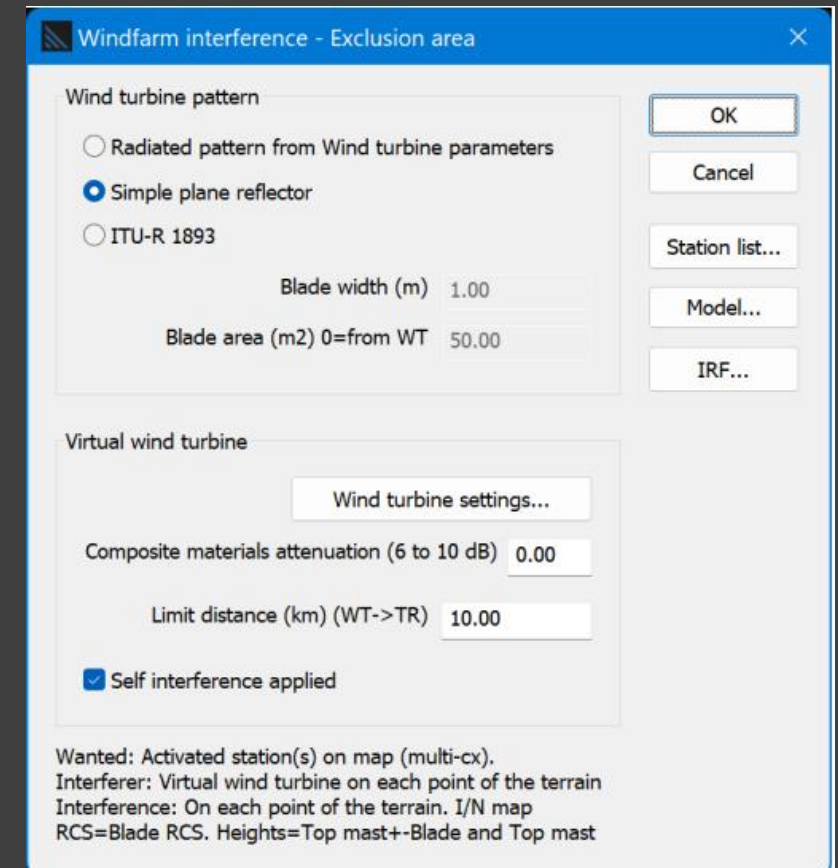
The wind turbine RCS is set for the blade and the heights considered at :

Top Mast +/- Blade size and Top Mast

An attenuation to consider the composite materials used for the WT can be applied. The result is an I/N map in dB with:

- I = Power received by each receiver due to reflections on the wind turbine;
- N = Noise level of the receiver.

If the "self interference applied" option is checked, interference will be checked on the receiving channel(s) of each transmitter.



Windfarm interference - Exclusion area

Wind turbine pattern

☐ Radiated pattern from Wind turbine parameters

☒ Simple plane reflector

☐ ITU-R 1893

Blade width (m) 1.00

Blade area (m2) 0=from WT 50.00

Virtual wind turbine

Wind turbine settings...

Composite materials attenuation (6 to 10 dB) 0.00

Limit distance (km) (WT->TR) 10.00

☒ Self interference applied

OK

Cancel

Station list...

Model...

IRF...

Wanted: Activated station(s) on map (multi-cx).
Interferer: Virtual wind turbine on each point of the terrain.
Interference: On each point of the terrain. I/N map
RCS=Blade RCS. Heights=Top mast+-Blade and Top mast

Windfarm interference features – Spectrum Management

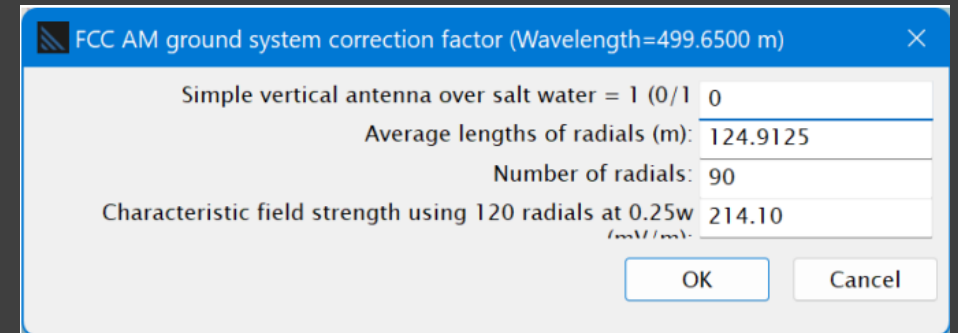
2. Interference levels are no more computed if the wind turbine is not seen from both the transmitter and the receiver.
3. During windfarm interference calculations in "Radiated pattern from Wind turbine parameters" mode, the antenna pattern of the wind turbine considered is always oriented towards the transmitting station (source signal).
4. STATION POPUP MENU/COVERAGE/ Windfarm C/I or I/N map has been optimized.
5. STATION POPUP MENU/COVERAGE/ Windfarm vs Radar I/N map: This feature has been removed. Use " Windfarm C/I or I/N map" instead

STATION PARAMETERS/General tab: Spectrum management

1. The "AM" button has been added (available only if the station frequency is lower than or equal to 30MHz). It will compute and update the "Tx add losses (dB)" parameter according to "AM Ground System Correction Factors" from FCC (<https://transition.fcc.gov/fcc-bin/fig8?ground-system-correction-factors>).

2. REGIONAL/ IT: DAB coordination

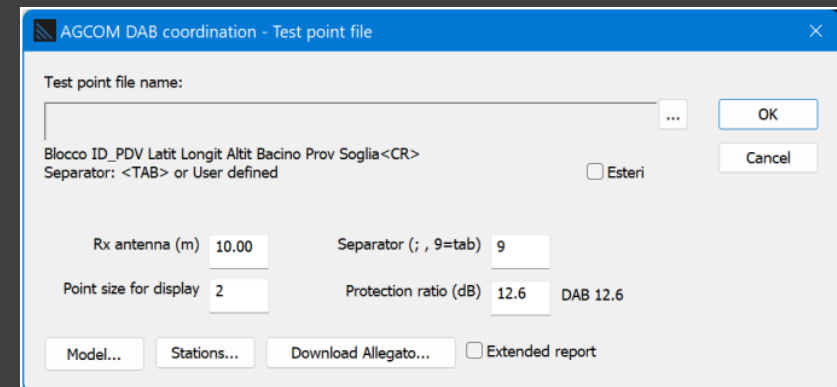
This feature will perform DAB coordination process according to AGCOM (Italy) rules considering national or international test points (text files).



FCC AM ground system correction factor (Wavelength=499.6500 m)

Simple vertical antenna over salt water = 1 (0/1)	0
Average lengths of radials (m):	124.9125
Number of radials:	90
Characteristic field strength using 120 radials at 0.25w <small>(mV/m)</small>	214.10

OK Cancel



AGCOM DAB coordination - Test point file

Test point file name: ... OK

Blocco ID_PDV Latit Longit Altit Bacino Prov Soglia<CR>
Separator: <TAB> or User defined ☐ Esteri Cancel

Rx antenna (m) Separator (; , 9=tab)

Point size for display Protection ratio (dB) DAB 12.6

Model... Stations... Download Allegato... ☐ Extended report

CCTV

CCTV Object: The vertical angle can now be set between +/-90°

General

Mast height (m)	<input type="text" value="20.00"/>
Azimuth (0-359°)	<input type="text" value="0.00"/>
Tilt (-90° +90°)	<input type="text" value="0.000"/>
Horizontal angle (deg)	<input type="text" value="180"/>
Vertical angle (deg)	<input type="text" value="90"/>

End of Document