



# IRDMAS

IR Measurements Database Management & Analysis Software



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*Complete Solution to  
IR Measurement Campaigns*

IR-DMMAS



## *Overview*

The recording, management and analysis of IR data in a systematic way can be a challenge for reasons often well known to the relevant community. One issue is that the product (recording) process of the IR data is often temporally and spatially (geographically) detached from the analysis process of the same data. Another issue is that the recorded data is raw (i.e. in proprietary media format) and proprietary analysis software does not provide an exhaustive and satisfactory feature set for users. Another issue is that the descriptive metadata for the operating environment and other vital auxiliary information (such as track data of the measured entity, meteorological information, calibration data, information on camera and filter combinations etc.) remains fragmented and uncorrelated requiring manual intervention and use of multiple non-interoperable software components, resulting in adhoc, error-prone analysis methodologies.

**IR Data Management and Analysis Software (IR-DMAS)** addresses these issues and provides a unique solution satisfying both operational and engineering level military requirements through the integration of planning, measurement, analysis and reporting phases of IR signature measurement campaigns. IR-DMAS consists of two tightly integrated components: Data Management Component (DMC) and IR Analysis Component (IRAC)

IR-DMAS can be customized in accordance with user requirements. Different language options are available on user demand.

# IR-DMAS Components

IR-DMAS consists of two integrated sub-systems each providing distinct set of advanced features:

## Data Management Component (DMC)

The DMC handles the creation, multi-modal display, querying and processing of data recorded during IR measurement sessions. These data consist of both metadata describing the details of the measurement exercise and its operating environment, and the recorded images, videos etc. Both of these data categories are correlated, stored and managed within a single framework in a systematic way, allowing the presentation of a coherent data model to the user.

## IR Analysis Component (IRAC)

The IRAC operates on the data managed by DMC through a well-defined integration interface, and provides an analysis workbench to the user. The analysis workbench enables a wide range of analysis functions to be selectively or collectively applied to a series of images, various graphs and reports to be generated, work sessions to be saved and loaded all in a single solution environment.



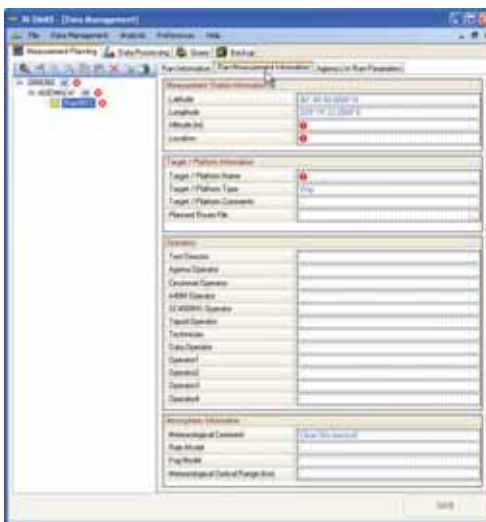
## Selected Features

- Association of multi-modal, multi-format fragmented data via a well-defined information model
- A more systematic way of capturing meta data
- A well defined procedure for recording vital auxiliary information
- Automatic data correlation
- Raw image processing for multiple camera types
- Easy to use analysis workbench for repetitive analysis tasks
- Archiving, management and reporting of full analysis data including vital contextual information
- Shorter analysis times, more reliable analysis results
- Database connected operation – Automatic transfer of parameters from database via query interface
- Database connected planning – Automatic transfer of parameters from planning interface to database
- User specific database (IR cameras, filters, lenses, station/location)
- User specific analysis by defining user specific formula definitions
- Powerful data exchange capabilities: Import / export interfaces
- User friendly and flexible graphical user interface

## MEASUREMENT PLANNING

Any measurement trial can be planned on daily run basis before the trial and can be edited after the trial. So, the necessary directories are created in this step according to the user defined options.

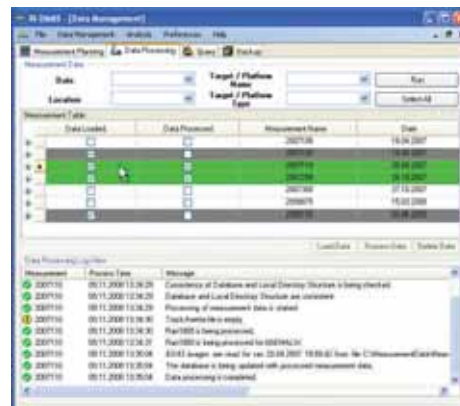
- General Run Information
  - User defined parameters (day / night, starting time, finishing time, etc.)
  - Software defined parameters (run name)
- Run Measurement Information
  - Measurement system information (location coordinates and name)
  - Measured platform information (name, type, comments and planned route)
  - Operators
  - Meteorological Information
- IR Camera Run Information
  - Measurement-specific camera parameters (lens name, filter name, temperature range measured, etc.)
  - User defined parameters (external optics temperature, external optics transmission, etc.)
  - Software calculated camera parameters (IFOV, FOV, etc.)
- Import / Export planned measurement
- Run edit operations (copy, edit, paste, delete)



## DATA PROCESSING

All measurements in the database can be viewed and be sorted according to measurement name, measurement date and its situation (unloaded / loaded but not processed / loaded and processed). Queries according to date, location, platform name and type can be selected using pull-down menus. These menus are auto generated by the software and only relevant information in the database is shown to the user.

- On demand preview of the measured data
- Data loading and checking data structure
- Intensive data processing to correlate all relevant information
- Data filtering



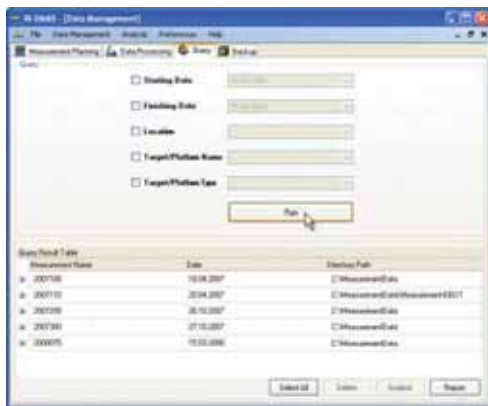


# QUERY

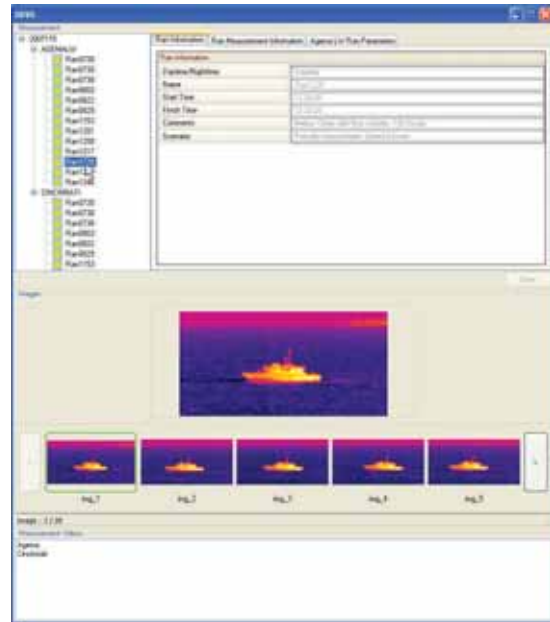
User selected query parameters are:

- Starting time
- Finishing time
- Location
- Platform name
- Platform type

Query results are presented to the user in a hierarchical view. The first level of query results are grouped according to the run name, the date and the data path. The second level of grouping is IR camera name and its serial number. For each camera, run name, location, platform name and platform type constitutes the third level of grouping.



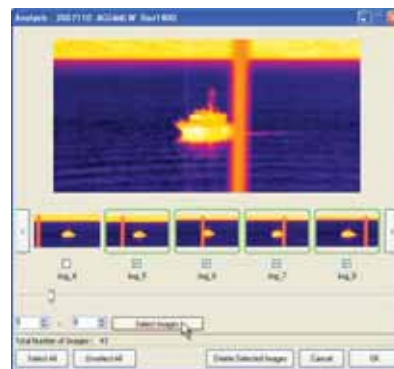
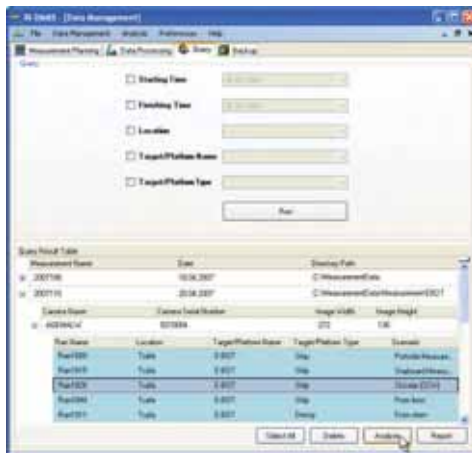
User can view search results by just double clicking the desired run. Detailed Data Visualization Screen (DDVS) window will be opened and in this window run information, camera parameters and measured data can be viewed.



# DATA ANALYSIS

Query results can be transferred directly to the data analysis module.

As a first step of data analysis, user can select desired image or images from the sequence. The range of images can be defined by using their image number.

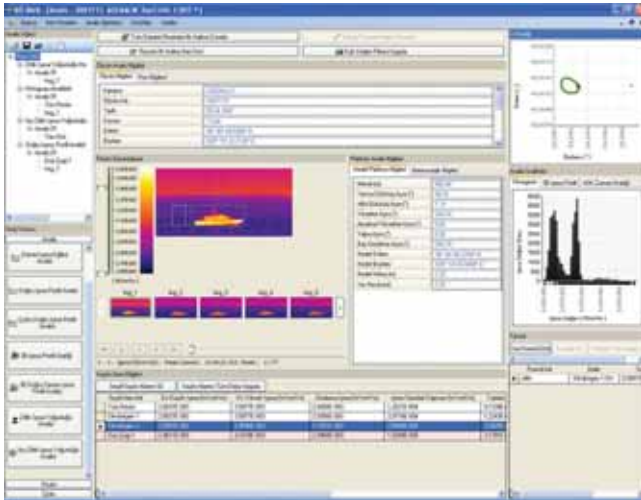




## TOOLBOX

Some of the data analysis capabilities of IR-DMAS can be listed as:

- Atmospheric transmission coefficient calculation (MODTRAN)
- Variation of atmospheric transmission coefficient during the run
- Platform position during the run
- Histogram
- Radiation – Time variation
- Radiation variation along single line
- Radiation variation along multiple line
- 3D Radiation profile
- 3D Line radiation versus time profile
- Contrast radiation intensity (single frame)
- Angular contrast radiation intensity
- Calculations using user defined formulas



User can select different analysis, drawing and image capabilities from the Toolbox.

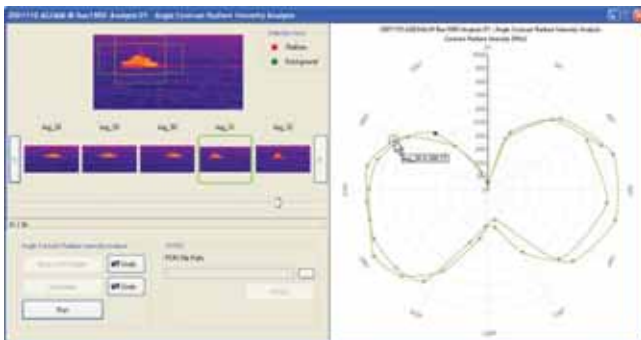


## SAVE AND BACK UP

User can define the source and backup destinations by using folder-browsing interface. Also, all the analysis done can be saved and imported/exported.



User can define target and background region in the images. The location and height/width parameters of this region can be adjusted manually. If desired, user can use linear interpolation technique to apply the region for whole series.



## REPORT

By using IR-DMAS report module user can create a report containing all the analysis done and can convert desired pages of the report into other file formats.





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