

How to use the NATIVE format reader

Readmsg.exe

This document describes summarily the way to operate the program *Readmsg.exe*, which has been created to help users with the inspection of *Meteosat Second Generation* (MSG) imagery during its commissioning phase.

The following instructions cover a range of display methods, like the single channel display, colour composites and pixel differences between channels which can be used to highlight meteorological phenomena. Documentation on how to take meteorological advantage of the data can be found on the EUMETSAT website.

This program works under Windows NT, 98, 2000, ME and XP and can use a coastline map in bitmap format (13779008 bytes, 3712 x 3712 coast values in 8 bit plus a small header of 64 bytes). It does not require installation and can be copied to an arbitrary directory and operated from there. It is fed by the information from the EUMETSAT archive in NATIVE format, which currently can be requested, at no cost, from the EUMETSAT Data Centre.

Operation recommendations

Once the program has been started for the first time, it is recommended to follow the box-filling sequence with the tabulator until some practice is acquired in choosing the values. The user can choose the following options:

- **Region**

To display the desired region, LATITUDE and LONGITUDE boxes should be filled with real numbers expressing degrees, either positive (for north and east directions) or negative (for south or west). The point entered will be in the center of the region displayed. The size of the image display is 840x840 pixels or less.

- **Channels**

Values for the CHANNEL box run from 1 to 11 for the respective channels from 0.6 micron to 13.4 micron, in increasing order of wavelength. If the content of this box is modified, either by typing a number or by operating the arrow buttons, the label close to it jumps to indicate the wavelength of the chosen channel which will be used for the next display operation.

Channel 12 is the high-resolution visible channel, with a three times better resolution than the other 11 channels. Some options which apply to channels 1 through 11 are not available for this high resolution visible channel. An example is the Resolution slider (intended for skipping lines and columns according to the value assigned to the slider) or the generation of Projections, since it is normally not useful to re-project a small area of 1000 km across, like those displayed at once for the high resolution channel.

Clicking on the REVERSE check box reverses the greyscale, so that high values map into black tones, and low values into white tones. This is recommended for the display of infrared channels, so that clouds appear white in all channels. Generally, the choice of a negative

number is accepted in boxes, to indicating reversed greyscales, but not in the CHANNEL box mentioned.

- **Height Focus**

The HEIGHT-FOCUS tick box provides different enhancements on intermediate values of the grey scale, using the 10-bit information. Otherwise, only eight-bit information is used for the display. This option allows to enhance the display around the brightness values roughly corresponding to a height suggested by the slider which is located nearby. The contrast level horizontal slider allows higher or lower values for the contrast function. The “Automatic enhance” tick box will apply a contrast as selected by default.

- **Resolution**

This option degrades the horizontal resolution of the image by a factor between 1 (right hand side) to 5 (left hand side). For instance, the choice of value 5 will take only every fifth pixel in a line or column.

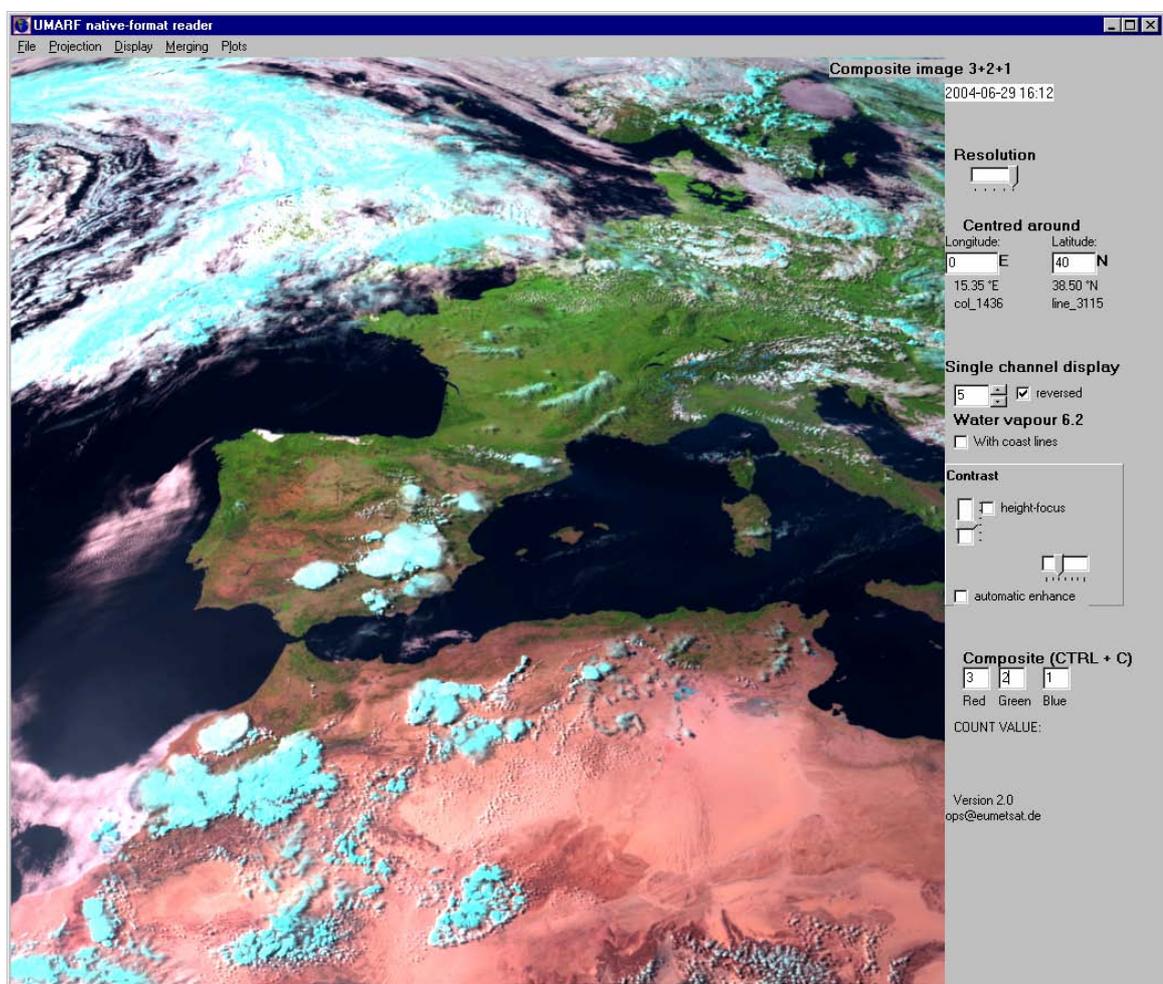


Figure 1. View of the Readmsg screen.

Generally, when you change any of the controls in the panel, the program will not change the display. The command that is invoked next will consider all the control values before proceeding with the request. Therefore, please note that a command or shortcut has to be executed to modify the display according to the new control values.

Main Menu Options

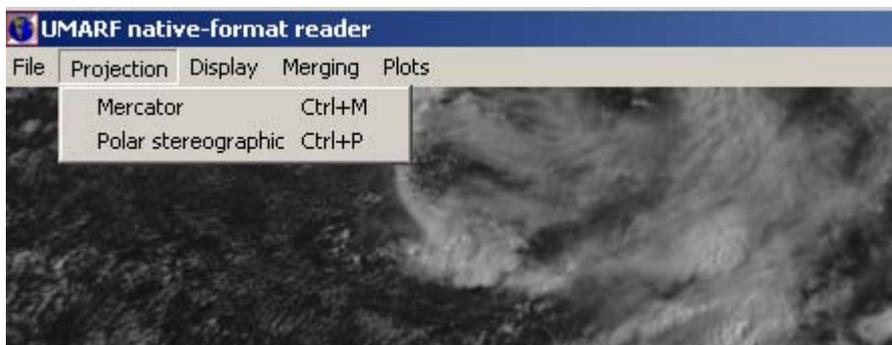
A brief description of the menu commands follows:



File Menu

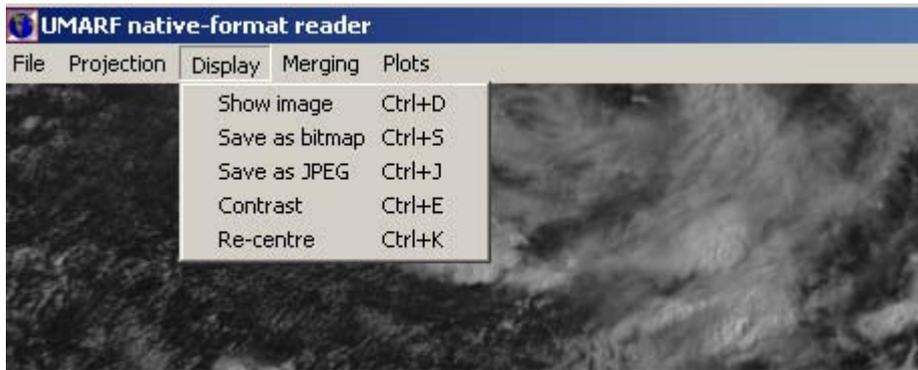
This menu only has one option:

- **Open image (Ctrl+O)**
This option presents a dialog box for the user to choose an new Native format image. This format can be for a partial file including only a few channels or a subset of the globe, or for a full format including all the spectral information for the whole globe.



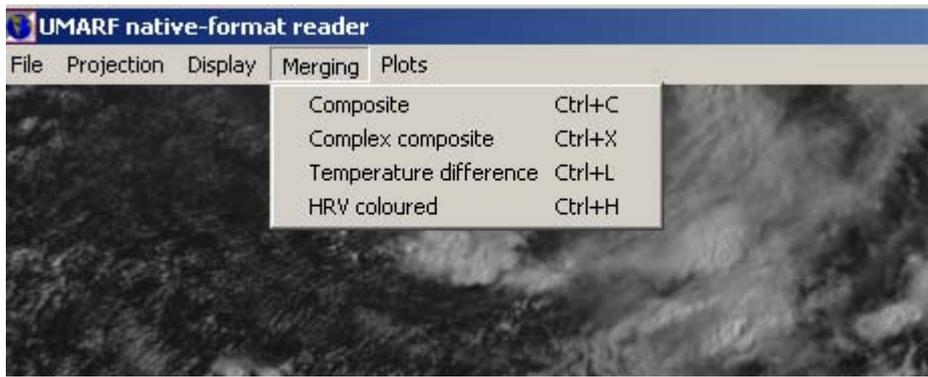
Projection Menu

- **Mercator (Ctrl + M)**
Projects the displayed region onto a Mercator map. A new form opens up, which allows saving the projected map as bitmap or activating the contrast choice.
- **Polar Stereographic projection (Ctrl + P)**
North Polar stereographic projection is available too.



Display Menu

- **Show image (Ctrl + D)**
Reads the boxes on the right hand side and displays the requested segment of the image. If not available in the NATIVE file, it will not have any effect.
- **Save Display (CTRL+S)**
Converts the display into a bitmap file which can be processed by a graphics program later, if you wish to add labels or embellish it. A label is anyway attached during the saving, with date and kind of product.
- **Save as JPEG (CTRL+J)**
Produces a jpeg file for the display, with compression factor of 90. A label is attached during the saving.
- **Contrast: (Ctrl+E)**
Filters the histogram and produces an enhanced version of the display, according to the horizontal ruler indication which is inside the Contrast box.
- **Re-centre (CTRL+K):**
Takes the cursor coordinates to the centre coordinates for the next choice of display.



Merging Menu

- **Composite (Ctrl+C)**
Combines three channels using the RGB scheme. The three channels in the boxes for red, green and blue components of a bitmap matrix, can be selected for colour display. Negative values are accepted as reversed scales, e.g. the value “-3” in the first box will put channel 1.6 micron in reversed values of RED. Negative values for the channel make sense to combine infrared with visible information, since cloud has high values in visible, but low values in infrared.
- **Complex composite (CTRL+X)**
Same as the previous, but combining channel differences at each colour. If zeros are used, no difference can be seen. Negative channel values are recommended to combine VIS and IR information, so that differential information is obtained.
- **Temperature difference (Ctrl+L)**
Generates the pixel to pixel difference between two channels, as selected in the RED and GREEN boxes of Composite.
- **HRV Coloured (CTRL+H)**
Supplies RGB composites in high resolution, where the colour is introduced by the values in the standard channels 1-11. Bad quality displays result from setting two or three boxes to other value than 12.



Plots menu

- **Temperature Scatter (CTRL + Q)**

When inspecting any display, for any location at the tip of the cursor and its surroundings (radius ca. 50 km, depending on the number of pixels chosen in the box), it displays the pixel distribution in terms of brightness values in the channels in the RED, GREEN and BLUE boxes. Further, when clicking two corners of a square on the scatterogram, all points included will be tainted in colour on the image. This function allows a sort of classification according to values in two or three channels.

This function is added to the menu for reference, but should be only used with the shortcut CTRL+Q when the cursor is over the region of interest.

- **Zoom in (CTRL + W)**

Centred on the cursor, this function magnifies by two the previous display. Then it enhances automatically the result. Use CTRL + E to control brightness, before zooming.

Additional image functionality

The display is sensitive to mouse movements, and shows the coordinates of the point below the cursor. You will read on the right hand side of the screen panel the count value (0.. 1023) divided by 4, since the program mostly disregards the last two bits of a pixel. You get a calculation of the brightness temperature corresponding to the channel or an approximate albedo value. High values indicate a hot emitter or high reflectance of sun radiation.

EUMETSAT declines any responsibility for deficiencies in the program, which is distributed for free on an “as is” basis. User support for this program cannot be provided.