

The RMIB SEVIRI Archive

This page gives some practical information about the SEVIRI data received and archived at RMIB: data availability and how to read the XPIF format.

History

The reception and archive of SEVIRI data for MSG-1 started 28 July 2003 (1 September 2003 for the SEVIRI header and trailer). There were a lot of missing segments in the images up to 15 November 2003 when the missing segments problem has been fixed. On 28 October 2003, a detection of missing segments was implemented and this information is available on the status pages (see below). Beginning of February 2004, the MSG-1 satellite entered the operational phase.

Technical Note

The following technical note fully describes the MSG data reception, processing and archiving at RMIB:

- https://gerb.oma.be/Documents/msg_chain.pdf

Reception and Archiving Status

The current status of the near real time processing and distribution on our main server *stratus* is given on:

- <https://gerb.oma.be/seviri/Status/timeliness.html>

Belgian area archive

To support the use of SEVIRI data by Belgian users, it has been decided to extract and separately archive the SEVIRI data over a rectangular area surrounding the country. This data is stored on our file server *tsunami* and is then easier to use. More details at:

- https://gerb.oma.be/seviri/Seviri_BEL/seviri_bel.html

Reading the XPIF format

The XPIF format was fully described in the following VCS document (**not anymore available**):

- <http://rst.vcs.de/Downloads/RST-SW-REF-XPIF-1.5.pdf>

Nevertheless, to read standard 3 km SEVIRI data (all except the HRV) you can simply skip the XPIF

header which is 50944 bytes long and then you can read the 3712 lines of 3712 pixels of short integer data (2 bytes). If you use a big-endian computer (like Silicon Graphics), you will have to byteswap the data (see below for a simple C program that performs the byteswapping). If you use a standard PC, no byteswapping is needed.

Getting the calibration in the XPIF file

The gain and the offset are available in the XPIF header as double precision floating point data (8 bytes) starting at bytes 214 and 222, respectively. As for the data, you will have to byteswap this data if you use a big-endian computer. The narrowband radiance L in $[mW/m^2/sr/(cm^{-1})]$ is obtained as:

$$L = \text{gain} * DC + \text{offset}$$

After conversion of this radiance in $[W/m^2/sr]$ (see annex), the brightness temperature for the thermal channels can be accurately estimated using the exponential fits provided on page 14 of the following document:

- https://gerb.oma.be/Documents/imager_dictionary.pdf

SEVIRI Data Geolocation

Thanks to the EUMETSAT rectification, the geolocation of the SEVIRI data is fixed. Images of the geodetic latitude and of the longitude (in degrees) are available in HDF5 files on our FTP site:

- <https://gerb.oma.be/seviri/Geolocation>

An overlay image, showing the country borders, is available in the file:

- https://gerb.oma.be/seviri/Overlay/SEVIRI_OVERLAY.pgm

Annex: Byte Swapping

```
void byte_swap_16(unsigned short int *buf, size_t num)
{
    while (num--) {
        *buf = ((*buf & 0x00ffU) << 8) | ((*buf & 0xff00U) >> 8);
        buf++;
    }
}
```

```
void byte_swap_64(unsigned long int *buf, size_t num)
{
    while (num--) {
        *buf = ((*buf & 0x00000000000000ffULL) << 56) |
              ((*buf & 0x000000000000ff00ULL) << 40) |
```

```
        ((*buf & 0x00000000ff0000U) << 24) |  
        ((*buf & 0x00000000ff0000U) << 8) |  
        ((*buf & 0x000000ff000000U) >> 8) |  
        ((*buf & 0x0000ff00000000U) >> 24) |  
        ((*buf & 0x00ff0000000000U) >> 40) |  
        ((*buf & 0xff000000000000U) >> 56);  
    buf++;  
}  
}
```

Annex: Integral of the SEVIRI filters

The spectral integration of the SEVIRI filters is given hereafter. This data allows to convert from [mW/m²/sr/(cm-1)] to [W/m²/sr].

HRV	8932.190025	[cm-1]
VIS 0.6	1824.616604	[cm-1]
VIS 0.8	876.101219	[cm-1]
IR 1.6	471.311575	[cm-1]
IR 3.9	365.631468	[cm-1]
WV 6.2	214.572920	[cm-1]
WV 7.3	88.624939	[cm-1]
IR 8.7	45.604889	[cm-1]
IR 9.7	26.629038	[cm-1]
IR 10.8	83.985849	[cm-1]
IR 12.0	65.836404	[cm-1]
IR 13.4	70.458815	[cm-1]

More details and the values for MSG-2 are given in the page 11 of the document:

- https://gerb.oma.be/Documents/imager_dictionary.pdf

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