

BUFR Overview

What is BUFR?

BUFR (Binary Universal Form for Representation of meteorological data) is a binary data format maintained by WMO. The Metview BUFR interface is based on [ecCodes](#) and can handle both BUFR [edition 3](#) and [edition 4](#) seamlessly.

The BUFR icon

BUFR files are represented by this icon in the user interface:



Examining BUFR contents

The contents of a BUFR file can be inspected with the **BUFR Examiner**, which can be started up from the user interface (right-click **examine** on the icon).

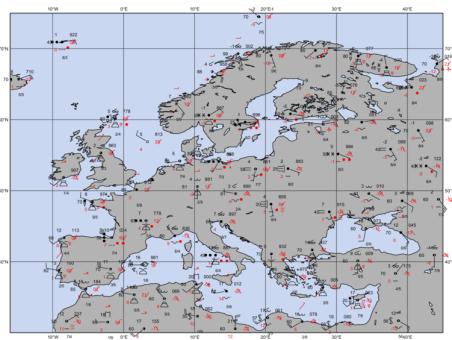
A screenshot of the Metview BUFR Examiner window. The title bar says "synop.bufr, Bufr Examiner (Metview)". The main area shows a table of BUFR message details. The first few rows are as follows:

Message	58	C	Mv	Lv	Ses	2	D	Key	Value	Units
43	0	1	ecmf	13	1	1	1	20150223		
44	0	1	ecmf	13	1	1	1	20150223		
45	0	1	ecmf	13	1	1	1	20150223		
46	0	1	ecmf	13	1	1	1	20150223		
47	0	1	ecmf	13	1	1	1	20150223		
48	0	1	ecmf	13	1	1	1	20150223		
49	0	1	ecmf	13	1	1	1	20150223		
50	0	1	ecmf	13	1	1	1	20150223		
51	0	1	ecmf	13	1	1	1	20150223		
52	0	1	ecmf	13	1	1	1	20150223		
53	0	1	ecmf	13	1	1	1	20150223		
54	0	1	ecmf	13	1	1	1	20150223		
55	0	1	ecmf	13	1	1	1	20150223		
56	0	1	ecmf	13	1	1	1	20150223		
57	0	1	ecmf	13	1	1	1	20150223		
58	0	1	ecmf	13	1	1	1	20150223		
59	0	1	ecmf	13	1	1	1	20150223		
60	0	1	ecmf	13	1	1	1	20150223		
61	0	1	ecmf	13	1	1	1	20150223		
62	0	1	ecmf	13	1	1	1	20150223		
63	0	1	ecmf	13	1	1	1	20150223		
64	0	1	ecmf	13	1	1	1	20150223		
65	0	1	ecmf	13	1	1	1	20150223		
66	0	1	ecmf	13	1	1	1	20150223		
67	0	1	ecmf	13	1	1	1	20150223		
68	0	1	ecmf	13	1	1	1	20150223		

A detailed view of the "Data" section shows specific parameters like "stationNumber" (382), "year" (2015), "month" (2), "day" (23), "hour" (12), "minute" (0), "latitude" (52.57), "longitude" (13.31), "heightOfStation" (37), "nonCoordinatePressure" (99370 Pa), "pressureAtMeanSeaLevel" (99820 Pa), "characteristicOfPressureTendency" (8), "windDirectionAt10M" (200 deg), "windSpeedAt10M" (7 m/s), "airTemperatureAt2M" (276.3999999999998 K), and "dewpointTemperatureAt2M" (275.1000000000002 K). The right panel displays detailed information for the selected parameter, such as key values, units, and definitions.

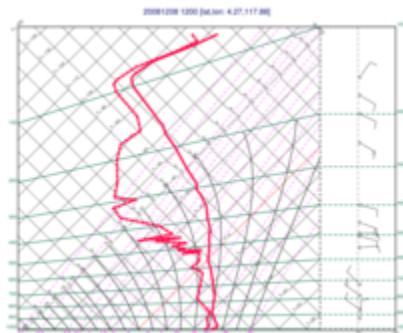
Visualisation on maps

Some conventional BUFR observation types (such as SYNOP and TEMP) can be directly visualised by Metview on a map view. In the user interface just right-click **visualise** on the icon to get a plot with the default settings. These plots can be further customised with the [Observation Plotting](#) icon.



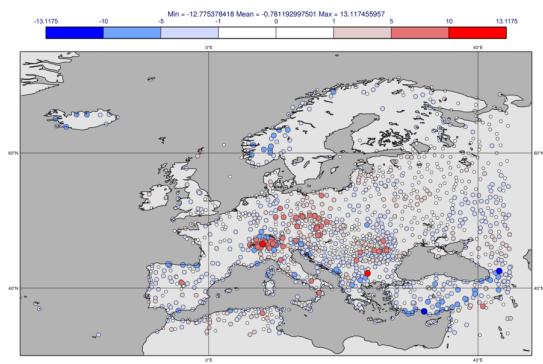
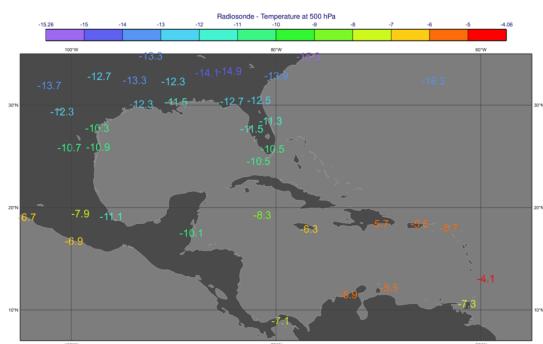
Visualisation on thermodynamic diagrams

The [Thermo Data](#) icon can extract thermodynamic profiles from BUFR, which can then be visualised in a tephigram, skew-t or emagram using the [Thermo View](#).



Filtering

Metview comes with its own filter to extract BUFR data into [Geopoints](#) or CSV, which can then be easily plotted and are very well suited for data processing. The filter is implemented by the [Observation Filter](#) and [Bufr Picker](#) icons, the latter one is being able to extract multiple values per message. The [Observation Filter](#)'s output can also be a new BUFR file (only containing the messages matching the filter).



Retrieval from MARS

If Metview has been configured with access to ECMWF's MARS archive, BUFR data can be retrieved via the [Mars Retrieval](#) icon. At ECMWF, MARS access is set up on all computer systems, while outside ECMWF the [MARS Web API](#) could be used in Metview (see the setup instructions [here](#)).

Script language support

Metview provides full support for BUFR from its [Macro](#) and [Python](#) interfaces.

The list of available **functions** for BUFR can be found on the [Observations Functions](#) and [Thermodynamic Functions](#) pages.

Tutorials

[Using BUFR in Metview](#) (part of the [Tutorials](#))

[ECMWF New Users Metview Tutorial](#)

Functions

[Observations Functions](#)

[Thermodynamic Functions](#)

Other resources

[Metview FAQ](#)

[Gallery](#)

[Jupyter Notebooks](#)