

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

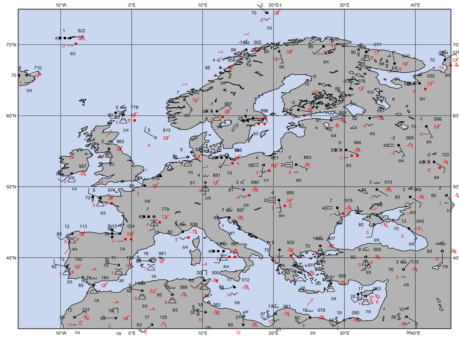
The contents of a BUFR file can be inspected with the **BUFR Examiner**, which can be started up from the user interface (right-click **examine** on the icon).

The screenshot shows the BUFR Examiner window. The top menu bar includes File, View, Profiles, Filter, and Help. Below the menu bar is a key profile dropdown set to 'rv System:Default'. The main area displays a list of messages with columns for Message, Type, Sub, C, Mv, Lv, Ssc, Z, and D. Message 58 is selected. To the right, a detailed view of message 58 is shown, including a data tree, a table of key-value pairs, and a summary of the message's metadata.

Key	Value	Units
subsetNumber	1	
blockNumber	10	Numeric
stationNumber	382	Numeric
stationType	1	CODE TABLE
year	2015	a
month	2	mon
day	23	d
hour	12	h
minute	0	min
latitude	52.57	deg
longitude	13.31	deg
heightOfStation	37	m
nonCoordinatePressure	99370	Pa
pressureReducedToMeanSeaLevel	99820	Pa
3HourPressureChange	-150	Pa
characteristicOfPressureTendency	8	CODE TABLE
windDirectionAt10M	200	deg
windSpeedAt10M	7	m/s
airTemperatureAt2M	276.39999999999998	K
dewpointTemperatureAt2M	275.10000000000002	K
relativeHumidity	96	%

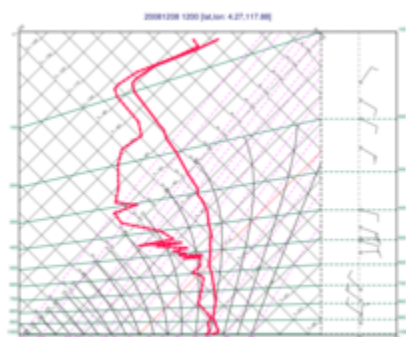
Visualisation on maps

Some conventional BUFR observations 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.



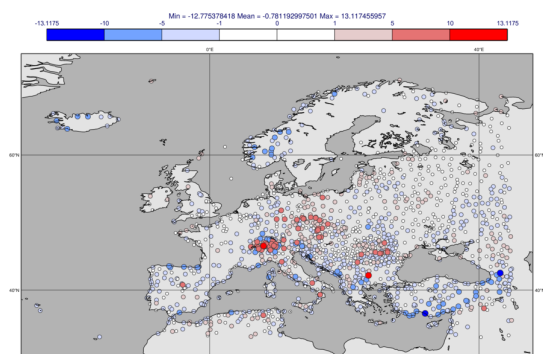
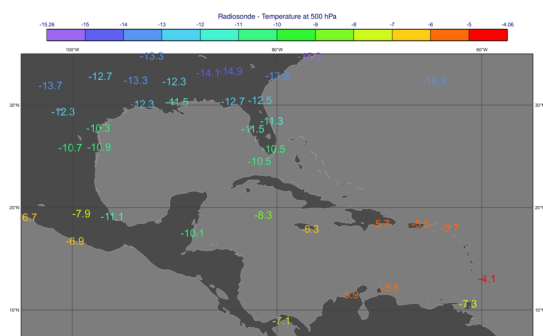
Visualisation on thermodynamic diagrams

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](#)