- BOM Australia
- CMA China
- KNMI Netherlands
- DMI Denmark
- ItaliaMeteo

Historical Weather

Ensemble Models

Climate Change

Marine Forecast

Air Quality

Satellite Radiation

Geocoding

Elevation

Flood

This API offers access to the renowned ICON weather models from the German Weather service DWD, delivering 15-minutely data for short-term forecasts in central Europe and 11 km resolution global forecasts. The ICON model is a preferred choice in generic weather forecast API if no other high resolution weather models are available.

Location and Time

Location: Coordinates List

Latitude
52.52

Longitude
13.41

Timezone
Not set (GMT+0)

Search

+

Time: Forecast Length Time Interval

Forecast days
7 days (default)

Past days
0 days (default)

By default, we provide forecasts for 7 days, but you can access forecasts for up to 16 days. If you're interested in past weather data, you can use the Past Days feature to access archived forecasts.

Hourly Weather Variables

- [ ] Temperature (2 m)
- [ ] Relative Humidity (2 m)
- [ ] Dewpoint (2 m)
- [ ] Apparent Temperature
- [ ] Precipitation (rain + showers + snow)
- [ ] Rain
- [ ] Showers
- [ ] Snowfall
- [ ] Snow Depth
- [ ] Weather code
- [ ] Sealevel Pressure
- [ ] Surface Pressure
- [ ] Cloud cover Total
- [ ] Cloud cover Low
- [ ] Cloud cover Mid
- [ ] Cloud cover High
- [ ] Visibility
- [ ] Evapotranspiration
- [ ] Reference Evapotranspiration (ET_0)
- [ ] Vapour Pressure Deficit

- [ ] Wind Speed (10 m)
- [ ] Wind Speed (80 m)
- [ ] Wind Speed (120 m)
- [ ] Wind Speed (180 m)
- [ ] Wind Direction (10 m)
- [ ] Wind Direction (80 m)
- [ ] Wind Direction (120 m)
- [ ] Wind Direction (180 m)
- [ ] Wind Gusts (10 m)
- [ ] Temperature (80 m)
- [ ] Temperature (120 m)
- [ ] Temperature (180 m)
- [ ] Soil Temperature (0 cm)
- [ ] Soil Temperature (6 cm)
- [ ] Soil Temperature (18 cm)
- [ ] Soil Temperature (54 cm)
- [ ] Soil Moisture (0-1 cm)
- [ ] Soil Moisture (1-3 cm)
- [ ] Soil Moisture (3-9 cm)
- [ ] Soil Moisture (9-27 cm)
- [ ] Soil Moisture (27-81 cm)

Additional Variables And Options

Solar Radiation Variables

Pressure Level Variables

Weather models

15-Minutely Weather Variables

Daily Weather Variables

- [ ] Weather code
- [ ] Maximum Temperature (2 m)
- [ ] Minimum Temperature (2 m)
- [ ] Maximum Apparent Temperature (2 m)
- [ ] Minimum Apparent Temperature (2 m)
- [ ] Sunrise
- [ ] Sunset
- [ ] Daylight Duration
- [ ] Sunshine Duration

- [ ] Rain Sum
- [ ] Showers Sum
- [ ] Snowfall Sum
- [ ] Precipitation Sum
- [ ] Precipitation Hours
- [ ] Precipitation Probability Max
- [ ] Maximum Wind Speed (10 m)
- [ ] Maximum Wind Gusts (10 m)
- [ ] Dominant Wind Direction (10 m)
- [ ] Shortwave Radiation Sum
- [ ] Reference Evapotranspiration (ET_0)

Current Weather

- [ ] Temperature (2 m)
- [ ] Relative Humidity (2 m)
- [ ] Apparent Temperature
- [ ] Is Day or Night
- [ ] Precipitation
- [ ] Rain
- [ ] Showers
- [ ] Snowfall

- [ ] Weather code
- [ ] Cloud cover Total
- [ ] Sealevel Pressure
- [ ] Surface Pressure
- [ ] Wind Speed (10 m)
- [ ] Wind Direction (10 m)
- [ ] Wind Gusts (10 m)

Note: Current conditions are based on 15-minutely weather model data. Every weather variable available in hourly data, is available as current condition as well.

Settings

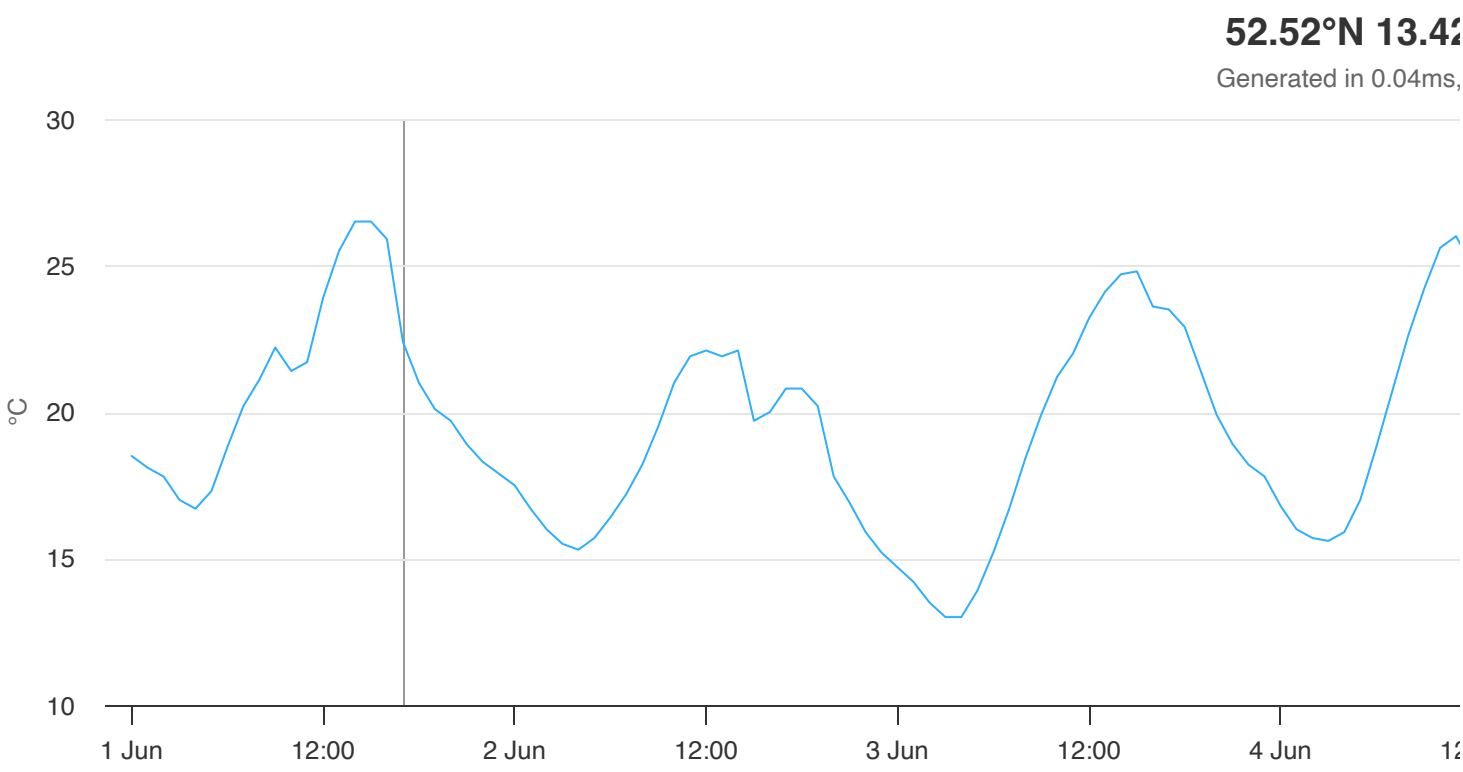
Temperature Unit: Celsius °C	Wind Speed Unit: km/h
Precipitation Unit: Millimeter	Timeformat: ISO 8601 (e.g. 2025-06-01)

Usage license: Non-Commercial | Commercial | Self-Hosted

Only for **non-commercial use** and less than 10.000 daily API calls. See Terms for more details.

API Response

Preview: Chart & URL | Python | TypeScript | Swift | Other



Download XLSX | Download CSV

API URL (Open in new tab or copy this URL into your application)

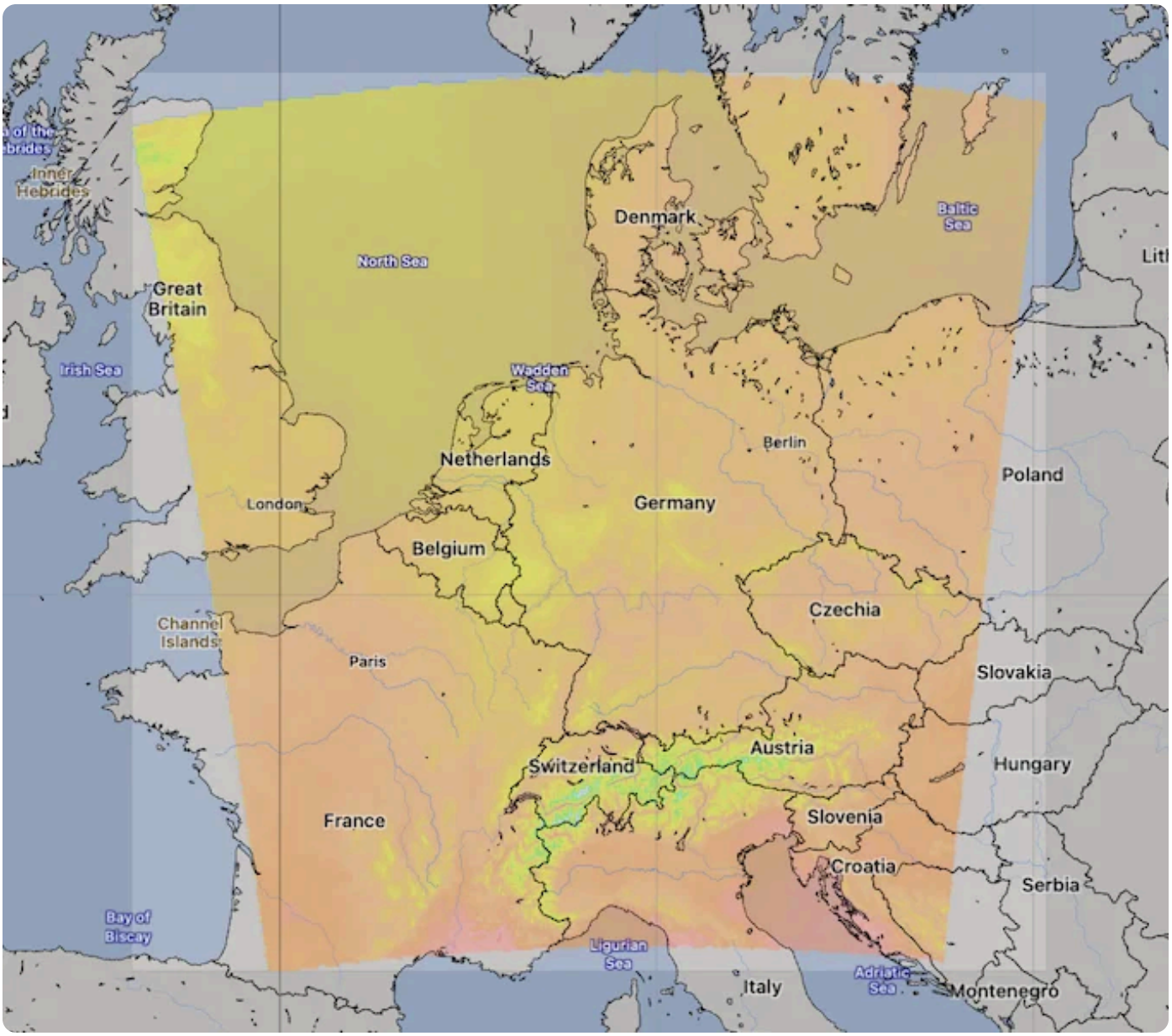
https://api.open-meteo.com/v1/forecast?latitude=52.52&longitude=13.41&hourly=temperatu

Data Sources

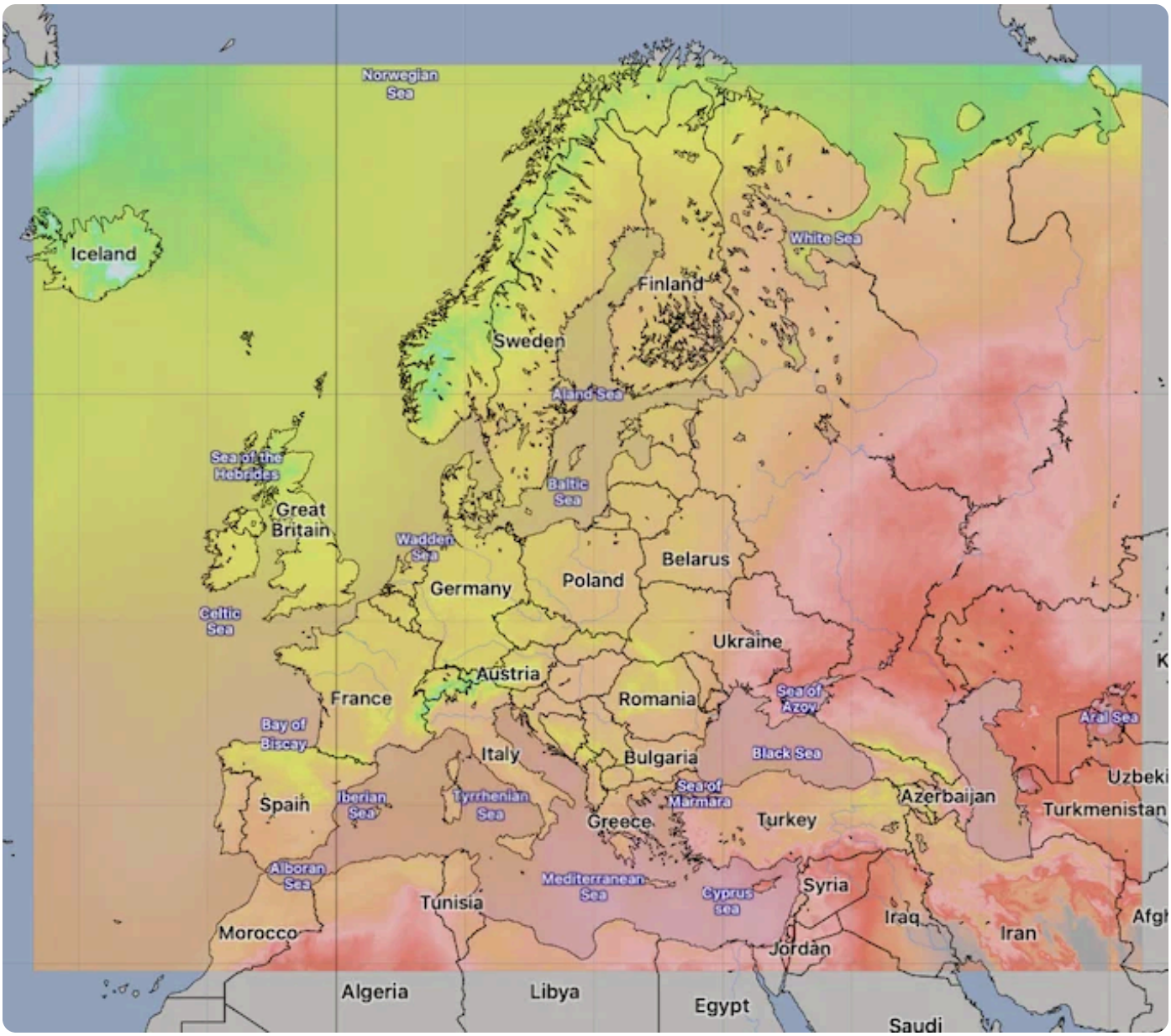
This API uses global DWD ICON weather forecast and combines them with high-resolution ICON Europe and Central Europe forecasts. Information about DWD wearther models is available here. For ICON Global and Europe, values are interpolated from 3-hourly to 1-hourly after 78 hours. 15-minutely data is only available for a small number of weather variables and only in Central Europe.

Weather Model	Region	Spatial Resolution	Temporal Resolution	Forecast L
ICON Global	Global	0.1° (~11 km)	Hourly, 3-hourly after 78 hours	7.5 days
ICON Europe	Europe	0.0625° (~7 km)	Hourly, 3-hourly after 78 hours	5 days
ICON D2	Central Europe	0.02° (~2 km)	15-Minutely	2 days

You can find the update timings in the model updates documentation.



ICON D2 Area. Source: Open-Meteo.



ICON EU Regional Model Area. Source: Open-Meteo.

API Documentation

The API endpoint `/v1/dwd-icon` accepts a geographical coordinate, a list of weather variables and responds with a JSON hourly weather forecast for 7 days. Time always starts at 0:00 today and contains 168 hours. All URL parameters are listed below:

Parameter	Format	Required	Default	Description
latitude, longitude	Floating point	Yes		Geographical WGS84 coordinates of the coordinates can be comma separated. E &latitude=52.52,48.85&longitude=13.4 multiple locations the JSON output char CSV and XLSX formats add a column lo
elevation	Floating point	No		The elevation used for statistical downs digital elevation model is used. You can correctly match mountain peaks. If &ele downscaling will be disabled and the AP height. For multiple locations, elevation separated.
hourly	String array	No		A list of weather variables which should comma separated, or multiple &hourly= used.
minutely_15	String array	No		A list of weather variables which should comma separated, or multiple &minutel can be used.
daily	String array	No		A list of daily weather variable aggregati returned. Values can be comma separat parameter in the URL can be used. If da specified, parameter timezone is requir
current	String array	No		A list of weather variables to get current
temperature_unit	String	No	celsius	If fahrenheit is set, all temperature valu Fahrenheit.
wind_speed_unit	String	No	kmh	Other wind speed speed units: ms , mp
precipitation_unit	String	No	mm	Other precipitation amount units: inch
timeformat	String	No	iso8601	If format unixtime is selected, all time v epoch time in seconds. Please note that For daily values with unix timestamps, p utc_offset_seconds again to get the cc

Parameter	Format	Required	Default	Description
timezone	String	No	GMT	If `timezone` is set, all timestamps are re is returned starting at 00:00 local-time. time zone database is supported. If `aut` coordinates will be automatically resolve multiple coordinates, a comma separate specified.
past_days	Integer (0-92)	No	0	If `past_days` is set, yesterday or the da also returned.
forecast_days	Integer (0-10)	No	7	Per default, only 7 days are returned. Up possible.
forecast_hours **forecast_minutely_15** **past_hours** **past_minutely_15**	Integer (>0)	No		Similar to forecast_days, the number of minutely data can controlled. Instead of reference, the current hour or the curre used.
start_date **end_date**	String (yyyy-mm-dd)	No		The time interval to get weather data. A ISO8601 date (e.g. `2022-06-30`).
start_hour **end_hour** **start_minutely_15** **end_minutely_15**	String (yyyy-mm-ddThh:mm)	No		The time interval to get weather data fo Time must be specified as an ISO8601 d `30T12:00`).
cell_selection	String	No	land	Set a preference how grid-cells are sele suitable grid-cell on land with similar ele coordinates using a 90-meter digital ele grid-cells on sea. `nearest` selects the n
apikey	String	No		Only required to commercial use to acce customers. The server URL requires the pricing for more information.

Additional optional URL parameters will be added. For API stability, no required parameters will be added in the future!

Hourly Parameter Definition

The parameter &hourly= accepts the following values. Most weather variables are given as an instantaneous value for the indicated hour. Some variables like precipitation are calculated from the preceding hour as an average or sum.

Variable	Valid time	Unit	Description
temperature_2m	Instant	°C (°F)	Air temperature at 2 meters above ground
relative_humidity_2m	Instant	%	Relative humidity at 2 meters above ground
dew_point_2m	Instant	°C (°F)	Dew point temperature at 2 meters above gr
apparent_temperature	Instant	°C (°F)	Apparent temperature is the perceived feels wind chill factor, relative humidity and solar
pressure_msl **surface_pressure**	Instant	hPa	Atmospheric air pressure reduced to mean s surface. Typically pressure on mean sea leve Surface pressure gets lower with increasing
cloud_cover	Instant	%	Total cloud cover as an area fraction
cloud_cover_low	Instant	%	Low level clouds and fog up to 3 km altitude
cloud_cover_mid	Instant	%	Mid level clouds from 3 to 8 km altitude
cloud_cover_high	Instant	%	High level clouds from 8 km altitude
wind_speed_10m **wind_speed_80m** **wind_speed_120m** **wind_speed_180m**	Instant	km/h (mph, m/s, knots)	Wind speed at 10, 80, 120 or 180 meters abo meters is the standard level.
wind_direction_10m **wind_direction_80m** **wind_direction_120m** **wind_direction_180m**	Instant	°	Wind direction at 10, 80, 120 or 180 meters a
wind_gusts_10m	Preceding hour max	km/h (mph, m/s, knots)	Gusts at 10 meters above ground as a maxir

Variable	Valid time	Unit	Description
shortwave_radiation	Preceding hour mean	W/m²	Shortwave solar radiation as average of the to the total global horizontal irradiation
direct_radiation **direct_normal_irradiance**	Preceding hour mean	W/m²	Direct solar radiation as average of the prec plane and the normal plane (perpendicular t
diffuse_radiation	Preceding hour mean	W/m²	Diffuse solar radiation as average of the pre
global_tilted_irradiance	Preceding hour mean	W/m²	Total radiation received on a tilted pane as a The calculation is assuming a fixed albedo o Please specify tilt and azimuth parameter. T is typically around 45°. Azimuth should be c east, 90° west, ±180 north). If azimuth is se assumes a horizontal tracker. If tilt is set to ' panel has a vertical tracker. If both are set to assumed.
sunshine_duration	Preceding hour sum	Seconds	Number of seconds of sunshine of the prece by direct normalized irradiance exceeding 1 definition.
vapour_pressure_deficit	Instant	kPa	Vapor Pressure Deficit (VPD) in kilopascal (water transpiration of plants increases. For l decreases
lightning_potential	Instant	J/kg	The Lightning Potential Index after Lynn and a vertical integral of the squared updraft vel that essentially contains the graupel concen
updraft	Instant	m/s	The maximum vertical updraft velocity withi
evapotranspiration	Preceding hour sum	mm (inch)	Evapotranspration from land surface and pla assumes for this location. Available soil wate evapotranspiration per hour equals 1 liter of
et0_fao_evapotranspiration	Preceding hour sum	mm (inch)	ET_0 Reference Evapotranspiration of a well w FAO-56 Penman-Monteith equations ET_0 is c wind speed, humidity and solar radiation. Ur ET_0 is commonly used to estimate the requir

Variable	Valid time	Unit	Description
precipitation	Preceding hour sum	mm (inch)	Total precipitation (rain, showers, snow) sun
snowfall	Preceding hour sum	cm (inch)	Snowfall amount of the preceding hour in ce equivalent in millimeter, divide by 7. E.g. 7 cr water equivalent
rain	Preceding hour sum	mm (inch)	Rain from large scale weather systems of th
showers	Preceding hour sum	mm (inch)	Showers from convective precipitation in mi hour
weather_code	Instant	WMO code	Weather condition as a numeric code. Follov codes. See table below for details.
snow_depth	Instant	meters	Snow depth on the ground
snowfall_height	Instant	meters	Height of snowfall limit above mean sea leve where the wet bulb temperature first exceed
freezing_level_height	Instant	meters	Altitude above sea level of the 0°C level
soil_temperature_0cm **soil_temperature_6cm** **soil_temperature_18cm** **soil_temperature_54cm**	Instant	°C (°F)	Temperature in the soil at 0, 6, 18 and 54 cm temperature on land or water surface tempe
soil_moisture_0_to_1cm **soil_moisture_1_to_3cm** **soil_moisture_3_to_9cm** **soil_moisture_9_to_27cm** **soil_moisture_27_to_81cm**	Instant	m^3/m^3	Average soil water content as volumetric mi 27 and 27-81 cm depths.
cape	Instant	J/kg	Convective available potential energy. See V
visibility	Instant	meters	Viewing distance in meters. Influenced by lo aerosols.

15-Minutely Parameter Definition

The parameter `&minutely_15=` can be used to get 15-minutely data. This data is based on the ICON-D2 model which is only available in Central Europe. If 15-minutely data is requested for locations outside Central Europe, data is interpolated from 1-hourly to 15-minutely.

15-minutely data can be requested for other weather variables that are available for hourly data, but will use interpolation.

Variable	Valid time	Unit	Description
shortwave_radiation	Preceding 15 minutes mean	W/m²	Shortwave solar radiation as average of the pre equal to the total global horizontal irradiation
direct_radiation **direct_normal_irradiance**	Preceding 15 minutes mean	W/m²	Direct solar radiation as average of the precedi horizontal plane and the normal plane (perpend
diffuse_radiation	Preceding 15 minutes mean	W/m²	Diffuse solar radiation as average of the preced
global_tilted_irradiance	Preceding 15 minutes mean	W/m²	Total radiation received on a tilted pane as aver calculation is assuming a fixed albedo of 20% a specify tilt and azimuth parameter. Tilt ranges f around 45°. Azimuth should be close to 0° (0° s ±180 north). If azimuth is set to "nan", the calcu tracker. If tilt is set to "nan", it is assumed that t tracker. If both are set to "nan", a bi-axial track
sunshine_duration	Preceding 15 minutes sum	Seconds	Number of seconds of sunshine of the precedi calculated by direct normalized irradiance exce WMO definition.
lightning_potential	Instant	J/kg	The Lightning Potential Index after Lynn and Ya vertical integral of the squared updraft velocity essentially contains the graupel concentration
precipitation	Preceding 15 minutes sum	mm (inch)	Total precipitation (rain, showers, snow) sum o

Variable	Valid time	Unit	Description
snowfall	Preceding 15 minutes sum	cm (inch)	Snowfall amount of the preceding 15 minutes ir equivalent in millimeter, divide by 7. E.g. 7 cm s water equivalent
rain	Preceding 15 minutes sum	mm (inch)	Rain from large scale weather systems of the p millimeter
showers	Preceding 15 minutes sum	mm (inch)	Showers from convective precipitation in millim minutes
snowfall_height	Instant	meters	Height of snowfall limit above mean sea level. It where the wet bulb temperature first exceeds 1
freezing_level_height	Instant	meters	Altitude above sea level of the 0°C level
cape	Instant	J/kg	Convective available potential energy. See Wiki

Pressure Level Variables

Pressure level variables do not have fixed altitudes. Altitude varies with atmospheric pressure. 1000 hPa is roughly between 60 and 160 meters above sea level. Estimated altitudes are given below. Altitudes are in meters above sea level (not above ground). For precise altitudes, `geopotential_height` can be used.

Level (hPa)	1000	975	950	925	900	850	800	700	600	500	400
Altitude	110 m	320 m	500 m	800 m	1000 m	1500 m	1900 m	3 km	4.2 km	5.6 km	7.2 k

All pressure levels have valid times of the indicated hour (instant).

Variable	Unit	Description
temperature_1000hPa temperature_975hPa, ...	°C (°F)	Air temperature at the specified pressure level. Air linearly with pressure.
relative_humidity_1000hPa relative_humidity_975hPa, ...	%	Relative humidity at the specified pressure level.

Variable	Unit	Description
dew_point_1000hPa **dew_point_975hPa, ...**	°C (°F)	Dew point temperature at the specified pressure le
cloud_cover_1000hPa **cloud_cover_975hPa, ...**	%	Cloud cover at the specified pressure level. Cloud c on relative humidity using Sundqvist et al. (1989). It low, mid and high cloud cover variables.
wind_speed_1000hPa **wind_speed_975hPa, ...**	km/h (mph, m/s, knots)	Wind speed at the specified pressure level.
wind_direction_1000hPa **wind_direction_975hPa, ...**	°	Wind direction at the specified pressure level.
geopotential_height_1000hPa **geopotential_height_975hPa, ...**	meter	Geopotential height at the specified pressure level. correct altitude in meter above sea level of each pr mistake it with altitude above ground.

Daily Parameter Definition

Aggregations are a simple 24 hour aggregation from hourly values. The parameter &daily= accepts the following values:

Variable	Unit	Description
temperature_2m_max **temperature_2m_min**	°C (°F)	Maximum and minimum daily air temperature at 2 r
apparent_temperature_max **apparent_temperature_min**	°C (°F)	Maximum and minimum daily apparent temperature
precipitation_sum	mm	Sum of daily precipitation (including rain, showers a
rain_sum	mm	Sum of daily rain
showers_sum	mm	Sum of daily showers
snowfall_sum	cm	Sum of daily snowfall
precipitation_hours	hours	The number of hours with rain
weather_code	WMO code	The most severe weather condition on a given day

Variable	Unit	Description
sunrise **sunset**	iso8601	Sun rise and set times
sunshine_duration	seconds	The number of seconds of sunshine per day is dete normalized irradiance exceeding 120 W/m², followin Sunshine duration will consistently be less than day and dusk.
daylight_duration	seconds	Number of seconds of daylight per day
wind_speed_10m_max **wind_gusts_10m_max**	km/h (mph, m/s, knots)	Maximum wind speed and gusts on a day
wind_direction_10m_dominant	°	Dominant wind direction
shortwave_radiation_sum	MJ/m²	The sum of solar radiation on a given day in Megajc
et0_fao_evapotranspiration	mm	Daily sum of ET_0 Reference Evapotranspiration of a

JSON Return Object

On success a JSON object will be returned.


```
{
    "latitude": 52.52,
    "longitude": 13.419,
    "elevation": 44.812,
    "generationtime_ms": 2.2119,
    "utc_offset_seconds": 0,
    "timezone": "Europe/Berlin",
    "timezone_abbreviation": "CEST",
    "hourly": {
        "time": ["2022-07-01T00:00", "2022-07-01T01:00", "2022-07-01T02:
        "temperature_2m": [13, 12.7, 12.7, 12.5, 12.5, 12.8, 13, 12.9, 1
    },
    "hourly_units": {
        "temperature_2m": "°C"
    }
}
```

Parameter	Format	Description
latitude, longitude	Floating point	WGS84 of the center of the weather grid-cell which was used t coordinate might be a few kilometers away from the requested
elevation	Floating point	The elevation from a 90 meter digital elevation model. This effe selected (see parameter cell_selection). Statistical downscalir conditions for this elevation. This elevation can also be controll elevation . If &elevation=nan is specified, all downscaling is di cell elevation is used.
generationtime_ms	Floating point	Generation time of the weather forecast in milliseconds. This is monitoring and improvements.
utc_offset_seconds	Integer	Applied timezone offset from the &timezone= parameter.
timezone **timezone_abbreviation**	String	Timezone identifier (e.g. Europe/Berlin) and abbreviation (e.g.
hourly	Object	For each selected weather variable, data will be returned as a f Additionally a time array will be returned with ISO8601 timesta
hourly_units	Object	For each selected weather variable, the unit will be listed here.
daily	Object	For each selected daily weather variable, data will be returned Additionally a time array will be returned with ISO8601 timesta
daily_units	Object	For each selected daily weather variable, the unit will be listed

Errors

In case an error occurs, for example a URL parameter is not correctly specified, a JSON error object is returned with a HTTP 400 status code.

```
{
    "error": true,
    "reason": "Cannot initialize WeatherVariable from invalid String value
        tempeture_2m for key hourly"
}
```

Weather variable documentation

WMO Weather interpretation codes (WW)

Code	Description
0	Clear sky
1, 2, 3	Mainly clear, partly cloudy, and overcast
45, 48	Fog and depositing rime fog
51, 53, 55	Drizzle: Light, moderate, and dense intensity
56, 57	Freezing Drizzle: Light and dense intensity
61, 63, 65	Rain: Slight, moderate and heavy intensity
66, 67	Freezing Rain: Light and heavy intensity
71, 73, 75	Snow fall: Slight, moderate, and heavy intensity
77	Snow grains
80, 81, 82	Rain showers: Slight, moderate, and violent
85, 86	Snow showers slight and heavy
95 *	Thunderstorm: Slight or moderate
96, 99 *	Thunderstorm with slight and heavy hail

(*) Thunderstorm forecast with hail is only available in Central Europe