

## DATA SET DESCRIPTION

### *Most recent 10-minute station observations of solar incoming radiation, longwave downward radiation and sunshine duration for Germany*

#### Version recent

**Cite data set as:** DWD Climate Data Center (CDC): Most recent 10-minute station observations of solar incoming radiation, longwave downward radiation and sunshine duration for Germany, version recent, last accessed: <date>.

#### INTENT OF THE DATASET

These low time latency, high time resolution data are from automatic weather stations of DWD and legally and qualitatively equivalent partner stations. The data from directory "now" have not completed quality control yet.

#### POINT OF CONTACT

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#### DATA DESCRIPTION

**Spatial coverage** stations in Germany

**Temporal coverage** yesterday - month before last month

**Temporal resolution** 10 minutes sampling interval

**Format(s)** The station observations (produkt\_\*.txt) are zipped for each station in one file. An overview over all stations with start and end dates is given in the station list: [https://opendata.dwd.de/climate\\_environment/CDC/help/zehn\\_min\\_tu\\_Beschreibung\\_Stationen.txt](https://opendata.dwd.de/climate_environment/CDC/help/zehn_min_tu_Beschreibung_Stationen.txt). Note that for convenience, the list comprises not only stations given here, but also stations with more complicated copyright regulations which may be obtained for certain applications, requiring discussion with the point of contact.

**Parameters** The file produkt\*.txt comprises following parameters:

STATIONS_ID	station identification number	
MESS_DATUM	end of interval in UTC	yyyymmddhhmi
QN	quality level of next columns	coding see paragraph "Quality information"
DS_10	10min-sum of diffuse solar radiation	J/cm <sup>2</sup>
GS_10	10min-sum of solar incoming radiation	J/cm <sup>2</sup>
SD_10	10min-sum of sunshine duration	h
LS_10	10min-sum of longwave downward radiation	J/cm <sup>2</sup>

with missing values are marked as -999. The solar incoming radiation includes the direct and the diffuse part of the solar radiation with respect to the horizontal plane. It is sometimes also referred to as "shortwave",

including the solar spectrum up to 2.8 micron, as opposed to "longwave", which refers to the thermal radiation of the atmosphere.

**Uncertainties** The stations are selected and operated according to WMO guidelines.

**Quality information** The quality level "Qualitätsniveau" (QN) given here applies for the following columns. QN and describes the method of quality control applied to a complete set of parameters, reported at a common time. The individual parameters of the set are connected with individual quality bytes in the DWD data base, which are not given here. Values marked as wrong are not given here. Different quality control procedures (and at different levels) have been applied to detect which values are identified as erroneous or suspicious. Over time, these procedures have changed.  
quality level (column header: QN)  
1- only formal control during decoding and import  
2- controlled with individually defined criteria  
3- ROUTINE automatic control and correction with QUALIMET

## DATA ORIGIN

These data are from the station networks of Deutschen Wetterdienst. For details the measurement procedures VuB 3 Beobachterhandbuch (DWD, 2014a), VuB 3 Technikerhandbuch (DWD, 2014b) and VuB 2 Wetterschlüsselhandbuch (DWD, 2013).

## VALIDATION AND UNCERTAINTY ESTIMATE

The data in directory "now" have not completed quality control yet.

## CONSIDERATIONS FOR APPLICATIONS

Data sets with quality level QN=1 may contain significant errors. Users have to decide whether for their particular application the more error prone 10-minute data should be used or rather the higher quality data (hourly or daily values). When investigating long term changes or trends, consider the station specific metadata provided in Metadaten\_Parameter\*, Metadaten\_Geraete\* and Metadaten\_Geographie\*, which are stored according to parameter in the subdirectories ../meta\_data/.

## ADDITIONAL INFORMATION

The data covering yesterday and 500 days back in time are stored in subdirectory /recent/. Versioned data extending the data further into the past can be found in the subdirectory "historical". For metadata see ../meta\_data/. When using data from subdirectories "historical", "recent" and "now" together, the change in quality should be considered.

## REFERENCES

Becker, R. and Behrens, K.: Quality assessment of heterogeneous surface radiation network data, Adv. Sci. Res., 8, 93-97, doi:10.5194/asr-8-93-2012, 2012.

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DWD Vorschriften und Betriebsunterlagen Nr. 3 (VuB 3), Technikerhandbuch (THB) für Wettermeldestellen des synoptisch-klimatologischen Mess- und Beobachtungsnetzes, März 2014b.

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Kaspar, F., et al.: Monitoring of climate change in Germany – data, products and services of Germany`s National Climate Data Centre. Adv. Sci. Res., 10, doi:10.5194/asr-10-99-2013, 99–106, 2013.

Long, C. and Dutton, E.: BSRN Global Network recommended QC tests, V2.0, Tech. rep., available as PDF at: <http://www.bsrn.awi.de>, 2002.

Spengler, R.: The new Quality Control- and Monitoring System of the Deutscher Wetterdienst. Proceedings of the WMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation, Bratislava, 2002.

## **COPYRIGHT**

The instructions in [ftp://ftp-cdc.dwd.de/pub/CDC/Terms\\_of\\_use.pdf](ftp://ftp-cdc.dwd.de/pub/CDC/Terms_of_use.pdf) should be followed. The DWD website provides comprehensive copyright information.

## **REVISION HISTORY**

The data in this directory are updated daily. This document is maintained by the National Climate Data Centre (NKDZ) of DWD, last edited 21.01.2019.