Digital Topographic Map 1 : 500 000,

Preliminary Edition

DTK500-V

Documentation as of 01.07.2015

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1 Index of data sets

Product	:	DTK500-V
Contents	:	Georeferenced raster data of the map „Bundesrepublik Deutschland 1 : 500 000“ (ÜK500) as 1 ***combined layer*** with the colour-coded map image and as 6 ***single layers***, which serve to generate the combined layer, and as 3 ***additional layers*** . (Map image of the combined layer without terrain representation by shadow relief)
Region	:	Federal Republic of Germany
Spatial relationships	:	In the sheet line system of the map ÜK500: - 1 **single sheet** In the BKG tiling system - ca. 110 **seamless tiles** 80 km x 80 km
Georeferencing	:	- Lambert conformal conical projection with two equidistant reference parallels 48°40’ and 53°40’ of northern latitude Ellipsoid WGS84 (here identical with GRS80), datum WGS84 (here identical with ETRS89) Reference centre: 10°30’ eastern longitude, 51°00’ northern latitude Height system NN - Gauss-Krüger projection in the 2nd, 3rd, 4th or 5th meridian strip Bessel ellipsoid, Potsdam datum (origin of Rauenberg), Height system NN - UTM projection in zone 32 or 33 Ellipsoid WGS84 (here identical with GRS80), datum WGS84 (here identical with ETRS89) Height system NN
Up-to-dateness	:	see metainformation system („Information on data“) under www.geodatenzentrum.de
Source	:	General Map 1:500 000 (normal edition, edition with administrative boundaries)
Production method	:	- Scan und digital updating of the raster data - Georeferencing of the raster data
Resolution	:	160, and 320 pixels/cm, resp. 406.4, and 812.8 dpi
Data formats	:	TIFF LZW, colour depth 8 bit, RGB palette
Data carriers	:	- at no charge as download and viewing service - with costs in ordering system (CD, DVD, FTP)

2 Description of data contents

2.1 General

The Digital Topographic Map 1 : 500 000 (ÜK500) includes the raster data of the normal edition and the edition with administrative boundaries of the General Map “Bundesrepublik Deutschland 1 : 500 000“ (ÜK500).

The raster data are subdivided into several layers according to their cartographic content. The DTK500-V has 1 combined layer and 9 single and additional layers.

The **combined layer** is a combination of the **single layers** 1-5 and 7 and offers the complete colour map image of the ÜK500 without terrain representation by shadow relief (hill shading).

Colours and structure of the **single and additional layers** for the DTK500 are basically corresponding to the colours of the ÜK500. Further practical thematic attributions of individual map elements were made in some layers. The user has therefore the advantage of an area-wide availability for each layer.

The single layers of all Digital Topographic Maps distributed by BKG have an identical structure, except for some scale-dependent special characteristics.

More differentiating information is possible due to the colour channels which are part of the single and additional layers and to each are attributed certain cartographic elements. (see 2.2).
When using selected single layers, please note that the layers are ready for map printing and are therefore containing background removals, i.e. the cartographic symbols may have graphical gaps in order to avoid certain overlays with symbols of other layers.

The 3 **additional layers** (layers 6, 8 and 9 in 2.2) are containing additional information like administrative area and hill shading, hypsometric tints. These additional layers have to be ordered explicitly because they are not part of the standard supply for single layers.

2.2 Content and colour charts of the single and additional layers

The following tables give descriptions of the content and the colour chart of each layer. The headline indicates the following:

- **Number of layer,** *e.g. Layer 1,*
- **Colour**, e.g. black,
- **Priority,** e.g. *P6,* indicates in which order the single layers have to be combined to produce the combined layer.

Layer 1

Black **P 6**

Channel	Content	Description
1	**Road traffic**	Outline of autobahn and main road
	Railway traffic	Railways
	Populated place	Outlines for populated places
2	**Populated place**	Symbols for populated places
	Number of tracks	
3	**Airport**	
4	**Road box with road number**	
5	**Isolated symbol**	
6	**Border**	Symbol
7	**Lettering**	Name of landscape or mountains
8	**Lettering**	Place name, appendix to lettering
0	**Background**	

Colour chart Layer 1

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1 - 8	0 0	0 0	0 0	black

Layer 2

Red **P 3**

Channel	Content	Description
1	**Populated place**	Mask for populated places
2	**Other populated place**	Mask for populated place symbol (square)
0	**Background**	

Colour chart Layer 2

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1 - 2	255 100	178 47	178 41	light red

Layer 3

Blue **P 4**

Channel	Content
1	**Water outline, bathymetric contour, tidal flat line**
2	**Inland water area**
3	**Sea area**
4	**Tidal flats**
5	**Swamp, marsh**
6	**Hydrographic lettering, isobath number**
0	**Background**

Colour chart Layer 3

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1 + 5 + 6	0 0	0 0	255 100	brook-blue
2	204 80	255 100	255 100	lake-blue
3	204 80	255 100	255 100	sea-blue
4	242 95	214 84	170 67	tidal flat-brown

Layer 4

Relief brown **P 2**

Channel	Content
1	**Contour**
2	**Steep coast**
3	**Contour number**
0	**Background**

Colour chart Layer 4

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1 - 3	178 70	102 40	0 0	relief-brown

Layer 5

Forest-green **P 1**

Channel	Content
1	**Forest**
0	**Background**

Colour chart Layer 5

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1	204 80	255 100	204 80	forest-green

Additional layer 6

Violet

Channel	Content	Description
1	**Administrative boundary**	Symbol
2	**Administrative boundary**	Band
3	**Name of administrative unit**	
0	**Background**	

Colour chart Layer 6

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1	204 80	102 40	217 85	violet
2 + 3	230 90	204 80	242 95	light violet

Layer 7

Red **P 5**

Channel	Content	Description
1	**Autobahn**	Mask
2	**Main road**	Mask
3	**Secondary road, other road**	
4	**Distance in km, distance symbol**	
5	**National border**	Band
0	**Background**	

Colour chart Layer 7

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1 - 2	255 100	89 35	89 35	red
3 - 4	255 100	89 35	89 35	red
5	255 100	89 35	89 35	red

Additional layer 8

Hill shading

Channel	Content
2-255	**Grey values of hill shading**
1	**Background**

Colour chart Layer 8

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1	255 100	255 100	255 100	white
2	2 0	2 0	2 0	grey tones
...	...	...	...	
255	255 100	255 100	255 100	

Additional layer 9

multicolour

Channel	Content	Description
1	**Hypsometric tint**	Depression
2	**Hypsometric tint**	0-75m
3	**Hypsometric tint**	75-150m
4	**Hypsometric tint**	150-300m
5	**Hypsometric tint**	300-450m
6	**Hypsometric tint**	450-600m
7	**Hypsometric tint**	600-900m
8	**Hypsometric tint**	900-1200m
9	**Hypsometric tint**	1200-1500m
10	**Hypsometric tint**	1500-2100m
11	**Hypsometric tint**	2100-2700m
12	**Hypsometric tint**	2700-3600m
13	**Hypsometric tint**	3600-4500m
0	**Background**	

Colour chart Layer 9

Channel	Red	Green	Blue	Colour	Meaning
0	255 100	255 100	255 100	weiß	background
1	230 90	230 90	217 85		hypsometric tint depression
2	255 100	255 100	217 85		hypsometric tint 0 – 75 m
3	255 100	255 100	179 70		hypsometric tint 75 – 150 m
4	255 100	243 95	153 60		hypsometric tint 150 – 300 m
5	255 100	238 93	140 55		hypsometric tint 300 – 450 m
6	255 100	230 90	127 50		hypsometric tint 450 – 600 m
7	243 95	217 85	127 50		hypsometric tint 600 – 900 m
8	230 90	204 80	115 45		hypsometric tint 900 – 1200 m
9	217 85	179 70	115 45		hypsometric tint 1200 – 1500 m
10	204 80	166 65	115 45		hypsometric tint 1500 – 2100 m
11	191 75	153 60	115 45		hypsometric tint 2100 – 2700 m
12	153 60	153 60	153 60		hypsometric tint 2700 – 3600 m
13	204 80	204 80	204 80		hypsometric tint 3600 – 4500 m

2.3 Contents and colour chart of the combined layer

The combined layer (L0) has the following colour chart and is created like indicated by combination of the single layers (L<i>):

Channel	Red	Green	Blue	Colour	L<i>/channel	Principal content
0	255 100	255 100	255 100	white	L<i>/k0	Background
1	0 0	0 0	0 0	black	L1k1-8, L6k1	Situation, lettering, borders
2	0 0	0 0	255 100	brook-blue	L3k1+5+6	Water
3	204 80	255 100	255 100	lake-blue	L3k2	Inland water areas
4	178 75	102 40	0 0	relief-brown	L4k1-3	Relief, contours
5	204 80	255 100	204 80	forest-green	L5k1	Forest
6	212 83	212 83	212 83	grey	not applied for DTK500-V	Industrial areas
7	242 83	214 78	170 75	tidal flat-brown	L3k4	Tidal flat areas
8	0 0	229 90	0 0	tree-green	not applied for DTK500-V	Vegetation outlines
9	255 100	242 95	89 30	yellow	not applied for DTK500-V	Regional traffic
10	255 100	89 30	89 30	red	L7k1-4	Mask for traffic
11	102 50	51 30	0 0	brown	not applied for DTK500-V	not applied
12	204 80	255 100	255 100	sea-blue	L3k3	Sea areas
13	255 100	89 30	89 30	red	not applied for DTK500-V	Populated places
14	255 100	178 70	178 70	light red	L2k1+2	Mask for residential development sites

Channel	Red	Green	Blue	Colour	L<i>/channel	Principal content
15	204 80	102 40	217 85	violet	not applied for DTK500-V	Boundary symbol
16	230 90	204 80	242 95	light violet	not applied for DTK500-V	Boundary band
17	217 85	153 60	217 85	light violet	not applied for DTK500-V	Name of administra-tive unit
18	115 45	166 65	90 35		not applied for DTK500-V	Hypsometric tint, depression
19	216 85	255 100	178 70		not applied for DTK500-V	Hypsometric tint 0-100m
20	255 100	255 100	255 100		not applied for DTK500-V	Hypsometric tint 100-200m
21	255 100	255 100	204 80		not applied for DTK500-V	Hypsometric tint 200-500m
22	255 100	242 95	153 60		not applied for DTK500-V	Hypsometric tint 500-1000m
23	255 100	216 85	38 15		not applied for DTK500-V	Hypsometric tint 1000-1500m
24	255 100	196 77	0 0		not applied for DTK500-V	Hypsometric tint 1500-2000m
25	255 100	178 70	0 0		not applied for DTK500-V	Hypsometric tint 2000-2500m
26	216 85	166 65	100 40		not applied for DTK500-V	Hypsometric tint 2500-3000m
27	130 50	0 0	64 25		not applied for DTK500-V	Hypsometric tint 3000-4000m
28	255 100	120 47	105 41	light red	L6k2+3	Boundary band
29	255 95	196 85	0 70	fallow-brown	not applied for DTK500-V	Fallow land
30	216 90	255 100	178 85	meadow-green	not applied for DTK500-V	Meadow, grassland
31	178 70	235 90	128 50	park-green	not applied for DTK500-V	Park
32	255 100	128 50	0 0	orange	not applied for DTK500-V	Long-distance traffic

Channel	Red	Green	Blue	Colour	L<i>/channel	Principal content
33	255 90	242 85	120 65	field-ochre	not applied for DTK500-V	Agricultural terrains
34	255 100	255 100	255 100	white	not applied for DTK500-V	Road mask
35	204 80	220 85	166 65	garden-green	not applied for DTK500-V	Garden areas

3 Information on data supply

Data supply is possible together with a free ***thematic choice*** of the layers out of the existing data. ***Spatial sections*** (preferably rectangular areas) can be defined in a flexible way. For large areas it is necessary to make the delivery as seamless tiles (see 5).

The ***online ordering system of the GeoDatenZentrum*** (www.geodatenzentrum.de → *ordering)* is offering all possibilities of data supply, is guiding the user through the product line indicating the standard specifications and special services and the pricing system as well (see 9).

Up-to-dateness *of the data* is indicated in the meta information system (www.geodatenzentrum.de → *About data and services*). Data supplies are including the up-to-date information for the data.

The map sheet, each tile and each rectangular section is supplied with an .akt-file showing line-by-line the map sheets name and the year the map sheet has been updated.

Example: Content of the file s3_04_01.akt

DTK500;2013

4 Sheet limits and BKG tiling systems

The single sheet is offered in the sheet line system of the General Topographic Map 1 : 500 000 (ÜK500), i.e. one raster data file is produced for each layer of this map sheet.

Large seamless data amounts are supplied as tiling systems defined for a long term. Dependent from georeferencing, the data are grouped into square georeferenced partial areas. This is favouring the manipulation and the future updating of the raster data (by changing individual tiles) through the user.

Sheet and tile indexes are available at www.geodatenzentrum.de.

The DTK500 is available as tiles of 80 km x 80 km. The tiles are numbered by lines and by columns, beginning top left with 00_00. Thus, e.g. the tile s3_06_08 is covering the 7th line and 9th column of the tiling system in the 3rd meridian strip of the Gauss-Krüger projection.

5 Description of data formats

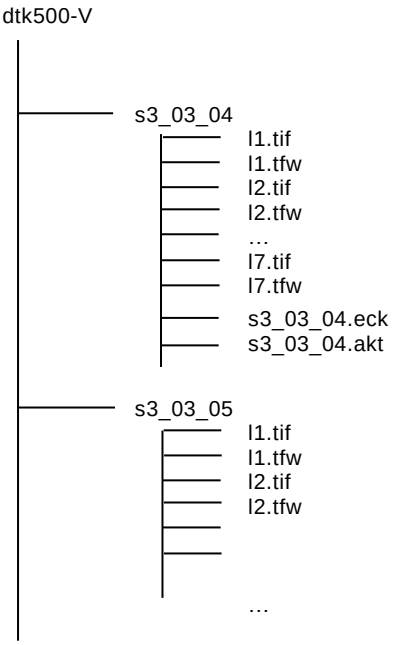
5.1 TIFF

The data will be delivered on the selected data carrier and will have the following directory structure:

<Name of the product>

- <Name of the map sheet, the tile or the region>
  - <Name of the layer>.tif
  - <Name of the layer >.tfw
  - ...
  - <Name of the map sheet, the tile or the region>.eck
  - <Name of the map sheet, the tile or the region>.akt

Example:



The following *georeferencing information* is available for each raster index:

- ASCII file with the extension „.eck" with the corners of the TIFF file in pixels and the corresponding world co-ordinates, line structure:

  X_Pixel Y_Pixel X_Welt Y_Welt

  in the order of the corners:

  2 3
  1 4

  Pixel co-ordinate system: origin (0,0) in the pixel centre of the left lower pixel,
  positive x axis directed to the right, positive y axis directed upwards.

- corresponding World file (file extension „.tfw").

Colour coded data (the combined layer and the single layers as standard) will preferably be delivered as *packed LZW*. The TIFF format uses an integrated RGB palette. Colour depth is 8 bit by default.

6 Software

6.1 General note

The Digital Topographic Data are supplied in the unified data structures described above supporting also large data amounts. For typical manipulations of this data structure and for those manipulations which may sometimes be necessary the GeoDatenZentrum will supply to the users the software described below.

You will find the programs in the web under www.geodantezentrum.de → *Information and notes* → *Software* for the operating systems UNIX (as Bourne Shell) and Windows (as EXE).

6.2 Flat storage of DTK

For small data amounts and for certain applications a “flat storage” of all data in only one directory may be suitable instead of a data storage in several directories.

The program *Flache_Ablage* is copying Digital Topographic Maps (DTK) from the subdirectories described in 6.1 into a common target directory. To store the files unambiguously into the target directory, the name of each relevant subdirectory is preceding them, e.g.: s3_01_01/I0.tif → s3_01_01_I0.tif.

You will find more information for the use of this program on our website and when starting the program.

6.3 Renaming of DTK

The program *Umbenennung* serves for renaming the individual layers of Digital Topographic Maps (DTK) within the subdirectories described above having the name of the sheet or tile. In the directory the colour coded combined layer is named I0 and the colour coded single layers are named I1, I2, … . While this uniform naming has some advantages for automated processing, it may in other cases be desired that the name of the layer should also include the name of the sheet or tile. The program is renaming all the layers by including in the first position the name of the directory, e.g. I0.tif → dtk500_I0.tif.

You will find more information for the use of this program on our website and when starting the program.

7 Test data

Test data are available for download under www.geodatenzentrum.de → *About data and services* → *test data*. Their contents and structures are processed in the same way like the data to be supplied and they are therefore very good suited for concrete test use.

8 Terms of use and acknowledgement of source

According to the Geodata Access Act (Geodatenzugangsgesetz) this data set is available at no charge via geodata services for download and online use for commercial and non-commercial use.

The use of geodata and geodata services is subject to the Verordnung zur Festlegung der Nutzungsbestimmungen für die Bereitstellung von Geodaten des Bundes (GeoNutzV, Regulation on the determination of terms of use for the provision of federal geodata) of 19 March 2013 (Federal Law Gazette 2013, Part I, No 14).

In particular, each user has to place the source remark to all geodata, metadata and geodata services visibly and optically connected. Changes, processings, new designs or other variations have to be provided with a change note in the source remark.

Source remark and change note have to be formulated as follows. When displayed on a web site, the source remark has to be linked with the URL "http://www.bkg.bund.de".

© GeoBasis-DE / BKG <year of last data supply>

© GeoBasis-DE / BKG <year of last data supply> (data changed)

Example:

© GeoBasis-DE / BKG 2013

9 Data supply

The data set is supplied free of charge in the most common specifications and as web service under

www.geodatenzentrum.de → *Open Data*

The data set can be ordered in further georeferencings in the Geodata Shop of the Service Centre against reimbursement of the costs. It can be provided on data carrier or via FTP:

www.geodatenzentrum.de → *Online Shop* → *Geodata Shop*

The extra costs for this are charged for by the BKG.

Orders may also be addressed to:

Bundesamt für Kartographie und Geodäsie
Referat GI5 - Dienstleistungszentrum
Karl-Rothe-Straße 10-14
D-04105 Leipzig

Tel.: +49(0)341 5634 333
Fax: +49(0)341 5634 415
E-Mail: dienstleistungszentrum@bkg.bund.de

Please find further information and more service at www.geodatenzentrum.de.