Digital Topographic Map 1 : 50 000,

Preliminary Edition

DTK50-V

Documentation as of 24.04.2014

Contents

DTK50-V – Seite

1 Index of data sets

Product	:	DTK50-V
Contents	:	Georeferenced raster data of the „Topographischen Karte 1 : 50 000“ (TK50) as 1 ***Combined layer*** with the colour-coded map image and as up to 6 ***single layers***, which are classified according to the map colours. (Map image without terrain representation by shadow relief)
Region	:	Federal Republic of Germany
Spatial relationships	:	In the sheet line system of the map TK50: - 779 **single sheets** In the BKG tiling systems of the different georeferencings: - ca 1110 **seamless tiles** 20 km x 20 km
Georeferencing	:	- Gauss-Krüger projection in the 2nd, 3rd, 4th or 5th meridian strip Bessel ellipsoid, Potsdam datum (origin of Rauenberg), Height system NN, HN, NHN - UTM projection in zone 32 or 33 Ellipsoid WGS84 (here identical with GRS80), datum WGS84 (here identical with ETRS89) Height system NN, HN, NHN - Lambert’s 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, HN, NHN
Up-to-dateness	:	see metainformation system („Information on data“) under www.geodatenzentrum.de
Source	:	- Topographic Map 1:50 000 (Map image without terrain representation by shadow relief)
Production method	:	- Scanning and digital updating of the raster data by the federal states *by the GeoDatenZentrum at the BKG:* - Harmonisation of the layer classification and the colour charts - Georeferencing and seamless data editing
Resolution	:	200 pixels/cm i.e. 508 dpi
Data formats	:	TIFF LZW, colour depth 8 bit, RGB palette TIFF CCITT GROUP4, colour depth 1 bit (black/white)
Data carriers	:	CD-ROM, DVD

2 Description of data contents

2.1 General

The Digital Topographic Map 1 : 50 000, preliminary edition (DTK50-V), includes the raster data of the „Topographische Karte 1 : 50 000“ (TK50) without terrain representation by shadow relief (hill shading).

The GeoDatenZentrum at the BKG has harmonised as far as possible the data, in particular for uniform structures of the content and of the data and for creation of seamless products.

Nevertheless, there exist certain differences between the federal states as regards the map graphics and the data structures which cannot be changed afterwards. They will be described in the following chapters by the documentation of the data structure.

The raster data are subdivided into several layers according to their cartographic content. The DTK50-V has 1 coloured combined layer and 6 single coloured layers.

The **combined layer** is a combination of the 12 black/white layers and offers the complete colour map image of the TK50.

Colours and structure of the **single layers** for the DTK50-V are basically corresponding to the colours of the TK50. Further practical thematic attribution 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. Here, layer 6 is meant for representing administrative boundaries with special colours (boundary bands and others). As this is not relevant for the DTK50-V, layer 6 is not taken up here.

More differentiating information is possible in the resolution 200 pixel/cm to the 2 – 7 colour channels which are part of the single layers and to each are attributed certain cartographic elements. (see 2.2).

It is possible to offer them as black-and-white raster data. In this case the layers 3, 5, and 7 are further subdivided by channel separation in order to distinguish the different brightness values of the standard print colours (see 2.2), so the number of layers may amount to a total of 14.

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.

2.2 Content and colour chart of the single layers by 200 pixel/cm

The following tables give descriptions of the content and the colour chart of each single layer. The headline gives the following distinctive characteristics:

- **Number of layer,** *i.e. Layer 1,*
- **Colour,** *i.e. black,*

The special characteristics in the data of the Länder are described as follows:

The following abbreviations are used for the federal Länder:

BB	Brandenburg
BW	Baden - Württemberg
BY	Bayern
HE	Hessen
MV	Mecklenburg - Vorpommern
NI	Niedersachsen
NW	Nordrhein - Westfalen
RP	Rheinland - Pfalz
SH	Schleswig - Holstein
SL	Saarland
SN	Sachsen
ST	Sachsen - Anhalt
TH	Thüringen

These abbreviations indicate that in the map sheets prepared by the state survey office of this land the representation marked with an „x“ is the relevant one.

Layer 1

Black

Chan-nel	Content	Federal land												
		BB	BW	BY	HE	MV	NI	NW	RP	SH	SL	SN	ST	TH
1	Situation	x	x	x	x	x	x	x	x	x	x	x	x	x
	Boundaries	x	x	x	x	x	x	x	x	x	x	x	x	x
	Lettering	x			x			x			x			x
	Nature protection area (rastered)					x								
	residential areas (rastered)					x								
	Military training area - rastered	x		x		x			x					x
	Rocks, sands		x	x		x	x			x				
2	Industrial areas	x		x										
3	Lettering for situa-tion			x		x	x		x	x		x	x	
5	Industrial building	x		x										
6	residential inside areas			x										
7	residential outside areas			x										
0	Background	x	x	x	x	x	x	x	x	x	x	x	x	x

* only for connection to the new federal states

Colour chart layer 1

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1 + 3	0 0	0 0	0 0	black
2	212 83	212 83	212 83	grey
5	99 39	99 39	99 39	grey
6	143 56	143 56	143 56	grey
7	184 72	184 72	184 72	grey

This layer will be delivered in the black/white format TIFF CCITT Group 4 in the form of the files l1k1.tif (including the channels k1, k3 and k4), l1k2.tif (including the channel k2), l1k5.tif (including the channel k5), l1k6.tif (including the channel k6) andl1k7.tif. (including the channel k7) separately for each Channel.

Layer 2

Red

Chan-nel	Content	Federal land												
		BB	BW	BY	HE	MV	NI	NW	RP	SH	SL	SN	ST	TH
1	Inhabited places - open development	x	x				x		x			x	x	x
2	Inhabited places – densely built-up	x				x	x					x	x	x
0	Background	x	x			x	x		x			x	x	x

Colour chart layer 2

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1	255 100	178 47	178 41	light red
2	255 100	89 30	89 30	red

This layer will be delivered in the black-and-white format TIFF CCITT Group 4 in the form of the file l2k1.tif (including the channel k1), and l2k2.tif (including channel k2).

Layer 3

Blue

Chan-nel	Content	Federal land												
		BB	BW	BY	HE	MV	NI	NW	RP	SH	SL	SN	ST	TH
1	Water shapes	x	x	x	x	x	x	x	x	x	x	x	x	x
	Water lettering	x	x	x	x	x	x	x	x	x	x	x	x	x
2	Water areas	x	x	x	x	x	x	x	x	x	x	x	x	x
3	Tidal flats						x			x				
0	Background	x	x	x	x	x	x	x	x	x	x	x	x	x

Colour chart layer 3

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

This layer will be delivered in the black-and-white format TIFF CCITT Group 4 in the form of the files l3k1.tif (including the channel k1), l3k2.tif (including the channel k2) and l3k3.tif (including the channel k3), separately for each channel.

Layer 4

Relief-brown

Chan-nel	Content	Federal land												
		BB	BW	BY	HE	MV	NI	NW	RP	SH	SL	SN	ST	TH
1	Contours	X	X	X	X	X	X	X	X	X	X	X	X	X
	Sands	X												
	Military training area												X	X
2	Military training area						X							
0	Background	X	X	X	X	X	X	X	X	X	X	X	X	X

Colour chart layer 4

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1 + 2	178 70	102 40	0 0	relief-brown

This layer will be delivered in the black-and-white format TIFF CCITT Group 4 in the form of the file l4k1.tif (including the channels k1 and k2), separately for each Channel.

Layer 5

Green

Chan-nel	Content	Federal land												
		BB	BW	BY	HE	MV	NI	NW	RP	SH	SL	SN	ST	TH
1	Forest areas	x	x	x	x	x	x	x	x	x	x	x	x	x
6	Vegetation shapes		x		x			x		x	x			
	Symbol for garden areas		x		x			x		x	x			
	Tree signature	x	x	x	x		x	x	x	x	x	x	x	x
	NSG signature						x					x	x	x
	Lettering	x		x			x		x			x	x	x
	Vineyards		x	x	x				x					
0	Background	x	x	x	x	x	x	x	x	x	x	x	x	x

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
6	0 0	229 90	0 0	tree-green

This layer will be delivered in the black-and-white format TIFF CCITT Group 4 in the form of the files l5k1.tif (including the channel k1) and l5k6.tif (including the channel k6), separately for each channel.

Layer 6

not occupied for DTK50-V.

Layer 7

Street-orange and street-yellow

Chan-nel	Content	Federal land												
		BB	BW	BY	HE	MV	NI	NW	RP	SH	SL	SN	ST	TH
1	Traffic class long-distance traffic	X	X	X	X	X	X	X	X	X	X	X	X	X
2	Traffic class regional traffic	X	X	X	X	X	X	X	X	X	X	X	X	X
0	Background	X	X	X	X	X	X	X	X	X	X	X	X	X

Colour chart layer 7

Channel	Red	Green	Blue	Colour
0	255 100	255 100	255 100	white
1	255 100	128 50	0 0	orange
2	255 100	242 95	89 35	yellow

This layer will be delivered in the black-and-white format TIFF CCITT Group 4 in the form of the files l7k1.tif (including the channel k1) and l7k2.tif (including the channel k2), separately for each channel.

2.3 Content and colour chart of the combined layer by 200 Pixel/cm

The combined layer (L0) has the following colour chart and is created as indicated by combination of the black/white layers (L<i>) in order of the priority:

Chan-nel	Red	Green	Blue	Colour	L<i>/channel	Priority	Principal con-tents
0	255 100	255 100	255 100	white	L<i>/k0		Background
1	0 0	0 0	0 0	black	L1k1+3	12	Situation, letter-ing, boundaries
2	0 0	0 0	255 100	brook-blue	L3k1	11	Water
3	204 80	255 100	255 100	lake-blue	L3k2	4	Inland water are-as
4	178 75	102 40	0 0	relief-brown	L4k1	6	Relief, contours
5	204 80	255 100	204 80	forest-green	L5k1	1	Forest
6	212 83	212 83	212 83	grey	L1k2	3	Industrial areas
7	242 83	214 78	170 75	tidal-flat-brown	L3k3	5	Tidal flats
8	0 0	229 90	0 0	tree-green	L5k6+7	10	Vegetation sha-pes
9	255 100	242 95	89 30	yellow	L7k2	7	Regional traffic
10	255 100	89 30	89 30	red	not applied for DTK50-V		Long-distance traffic
11	102 50	51 30	0 0	brown	not applied for DTK50-V		not applied
12	204 80	255 100	255 100	sea-blue	not applied for DTK50-V		Sea areas
13	255 100	89 30	89 30	red	L2k2	8	Inhabited places
14	255 100	178 70	178 70	light red	L2k1	9	Mask for residen-tial development sites

Chan-nel	Red	Green	Blue	Colour	L<i>/channel	Priority	Principal con-tents
15	204 80	102 40	217 85	boundary-violet	not applied for DTK50-V		Boundary symbol
16	230 90	204 80	242 95	light violet	not applied for DTK50-V		Boundary band
17	217 85	153 60	217 85	light violet	not applied for DTK50-V		Name of adminis-trative unit
18	115 45	166 65	90 35		not applied for DTK50-V		Hypsometric tint depression
19	216 85	255 100	178 70		not applied for DTK50-V		Hypsometric tint 0-100m
20	255 100	255 100	255 100		not applied for DTK50-V		Hypsometric tint 100-200m
21	255 100	255 100	204 80		not applied for DTK50-V		Hypsometric tint 200-500m
22	255 100	242 95	153 60		not applied for DTK50-V		Hypsometric tint 500-1000m
23	255 100	216 85	38 15		not applied for DTK50-V		Hypsometric tint 1000-1500m
24	255 100	196 77	0 0		not applied for DTK50-V		Hypsometric tint 1500-2000m
25	255 100	178 70	0 0		not applied for DTK50-V		Hypsometric tint 2000-2500m
26	216 85	166 65	100 40		not applied for DTK50-V		Hypsometric tint 2500-3000m
27	130 50	0 0	64 25		not applied for DTK50-V		Hypsometric tint 3000-4000m
28	255 100	120 47	105 41	light red	not applied for DTK50-V		Boundary band
29	255 95	196 85	0 70	fallow-land-brown	not applied for DTK50-V		Fallow land
30	216 90	255 100	178 85	meadow-green	not applied for DTK50-V		Meadow, grass-land
31	178 70	235 90	128 50	park-green	not applied for DTK50-V		Park

Chan-nel	Red	Green	Blue	Colour	L<i>/channel	Priority	Principal con-tents
32	255 100	128 50	0 0	orange	L7K1	7	Long-distance traffic
33	255 90	242 85	120 65	field-ochre	not applied for DTK50-V		Agricultural area
34	255 100	255 100	255 100	white	not applied for DTK50-V		Road mask
36	99 39	99 39	99 39	grey	L1K5	3	**Industrial build-ing**
37	143 56	143 56	143 56	grey	L1K6	3	**residential in-side areas**
38	184 72	184 72	184 72	grey	L1K7	3	**residential out-side areas**

3 Data volume

The data volume of the entire data set (all map sheets or all tiles) amounts for the individual data formats to:

Specification	**Data volume in MB**		
	TIFF LZW	**TIFF CCITT-Group4**	
Combined layer resolution 200 pixels/cm	6.300	-	
Single layer resolution 200 pixels/cm	up to max. 3.600 (l1) total 10.500	up to max. 1.500 (l1) total 3.300	

4 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 single map sheets or 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).

Updatedness *of the data* is indicated in the meta information system (www.geodatenzentrum.de → *Information on data*). Data supplies are including the updatedness information for the data.

Each map sheet, each tile and each rectangular section is supplied with an updatedness file indicated by .akt showing line per line the relevant map sheets and the year of updating for the map sheet.

Example: Content of the file s3_04_01.akt

CC3902,2000
CC3102,2000

Data supply is also including a ***sheet and tile index*** (see 5) and ***software*** for manipulation of the data structure if necessary (see 7).

5 Sheet limits and BKG tiling systems

The single sheets are offered in the sheet line system of the Topographic Map 1 : 50 000 (TK50), 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 DTK50-V is available as tiles of 20 km x 20 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.

For a better orientation the data in the BKG tiling systems are supplied together with sheet and tile indexes and with national boundaries in the shape format and with the software ArcExplorer for direct visualisation.

6 Description of data formats

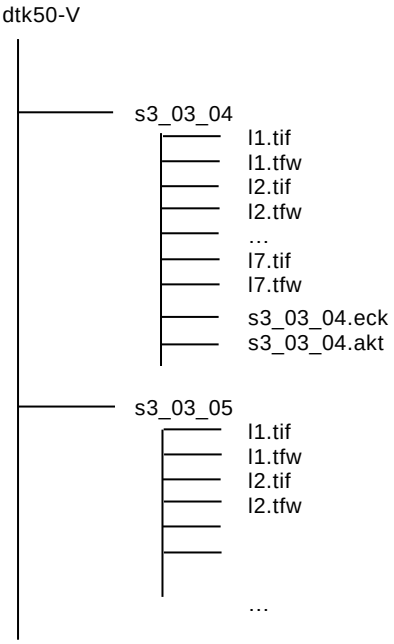
6.1 TIFF

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 Worldfile (file extension „.tfw”, among others for ArcInfo, ArcView, ArcExplorer).

Colour coded data (the combined layer and the single layers as standard) will preferably be delivered as *packed LZW*. Unpacked data delivery for small sections will be possible on request. The TIFF format uses an integrated RGB palette. Colour depth is normally 8 bit.

Black-and-white coded data (single layers on special request) will be supplied as *CCITT GROUP4* package. The layers 3, 5, 7 will further be subdivided by channel separation in order to detect the different intensity values of the standard print colours (see 2.2).

7 Software

7.1 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 on each first data carrier delivered for your order, and also in the web under www.geodantezentrum.de → *Software* for the operating systems UNIX (as Bourne Shell) and Windows (as EXE).

7.2 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 and/or 6.2 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.: cc2334/I0.tif → cc2334_I0.tif.

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

7.3 Renaming the 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 → c1234_I0.tif.

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

8 Test data

Test data are available for download under www.geodatenzentrum.de → 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.

9 Ordering and other services

Please send your order via our **online ordering system** under www.geodatenzentrum.de → *ordering.*

Orders may also be addressed to:

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D-04105 Leipzig

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