

ORDNANCE SURVEY GB

I:50 000 SCALE COLOUR RASTER – TECHNICAL SPECIFICATION

Version history

| Version | Date | Description |
|---------|---------|--|
| 1.1 | 08/2019 | Minor updates. |
| 1.2 | 12/2021 | Minor formatting updates. Introduction of GeoTIFF format to the product. |

Purpose of this document

This document provides information about and insight into the 1:50 000 Scale Colour Raster product and its potential applications. For information on the contents and structure of 1:50 000 Scale Colour Raster, please refer to the Overview.

The terms and conditions on which 1:50 000 Scale Colour Raster is made available to you and your organisation are contained in that Ordnance Survey customer contract. Please ensure your organisation has signed a valid current customer contract to be able to use 1:50 000 Scale Colour Raster.

We may change the information in this document at any time, giving you the notice period set out in your contract. We do not accept responsibility for the content of any third-party websites referenced or accessed in or through this document.

This document has been screened according to Ordnance Survey's Equality Scheme. If you have difficulty reading this information in its current format and would like to find out how to access it in a different format (braille, large print, computer disk or in another language), please contact us on: +44 (0)3456 05 05 05.

Copyright in this document

© Ordnance Survey Limited 2021. This document (including for the avoidance of doubt, any mapping images reproduced within it) is protected by copyright and apart from the rights expressly granted within this document to use the content, all rights are reserved. Any part of this document may be copied for use internally in your organisation or business so that you can use 1:50 000 Scale Colour Raster under the terms of your licence (but not otherwise).

No part of this document may be reproduced or transmitted in any form or by any means (including electronically) for commercial exploitation, onward sale or as free promotional material without getting the written consent of Ordnance Survey beforehand.

Trademarks

Ordnance Survey, OS and the OS Logos are registered trademarks, and 1:50 000 Scale Colour Raster is a trademark of Ordnance Survey, Britain's mapping agency.

- Motorola is a registered trademark of Motorola, Inc.
- Unisys is a registered trademark of Unisys Corporation.
- Unix is a registered trademark of X/Open Company Ltd.

Contact details

[OS website 'Contact us' page \(https://www.ordnancesurvey.co.uk/contact-us\)](https://www.ordnancesurvey.co.uk/contact-us).

Contents

| | |
|---|----------|
| 1. Product specification | 4 |
| 2. Product legend | 5 |
| 2.1 Common mapping abbreviations used in the product..... | 5 |
| 3. Georeferencing | 6 |
| 4. Image file directory (TIFF) | 7 |
| Annex A: Glossary..... | 9 |

I. Product specification

The following sections contain information about I:50 000 Scale Colour Raster, including file compression, legends, georeferencing and formats.

Table 1: Product specification.

| I:50 000 Scale Colour Raster specification | |
|--|---|
| Specification | I:50 000 Scale Colour Raster |
| Number of tiles in Great Britain | 816 (edge matched) England: 421 Scotland: 338 Wales: 86 |
| Tile size | 20 km by 20 km |
| Availability | National coverage |
| Resolution | 254 and 660 dots per inch |
| Data structure | Raster |
| Transfer format | TIFF palette 8-bit (256 colours) LZW* uncompressed TIFF palette 8-bit (256 colours) with LZW* compression GeoTIFF with LZW* compression Windows® BMP 8-bit colour (256 colours) uncompressed |
| Storage volumes per tile | 0.3–18 Mb |
| Update frequency | Quarterly: March, June, September and December (change-only updates) |

* If LZW compressed formats are used, then registration may be required. Information is available on the [Unisys® website \(www.unisys.com\)](http://www.unisys.com).

2. Product legend

Maintained versions (in English and Welsh) of the 1:50 000 Scale Colour Raster legend, which defines all of the map symbols used in the product, can be found on the 1:50 000 Scale Colour Raster Product Support page of the OS website:

- [English version of the 1:50 000 Scale Colour Raster legend](https://www.ordnancesurvey.co.uk/documents/50k-raster-legend.pdf)
(<https://www.ordnancesurvey.co.uk/documents/50k-raster-legend.pdf>)
- [Welsh version of the 1:50 000 Scale Colour Raster legend](https://www.ordnancesurvey.co.uk/documents/resources/50k-raster-legend-welsh.pdf)
(<https://www.ordnancesurvey.co.uk/documents/resources/50k-raster-legend-welsh.pdf>)

2.1 Common mapping abbreviations used in the product

A full list of the [common mapping abbreviations used in 1:50 000 Scale Colour Raster](https://www.ordnancesurvey.co.uk/documents/resources/abbreviations-used-on-os-25k-and50k-scale-mapping.pdf) is available on the OS website (<https://www.ordnancesurvey.co.uk/documents/resources/abbreviations-used-on-os-25k-and50k-scale-mapping.pdf>).

3. Georeferencing

A definition for registering raster images within a geographic framework is the process of assigning map coordinates to the raster image data and resampling the pixels of the image to conform to the map projection grid. This allows tiles of map data to be located in their correct geographic position relative to the map projection and also to themselves.

Great Britain is surveyed and mapped using the Transverse Mercator (or Gauss-Kruger) projection, so all raster tiles will be mapped to this projection as it applies to Ordnance Survey National Grid if using world or TAB files supplied by Ordnance Survey.

Within the MapInfo format (MIF) record header, the following information will be found under COORDSYS:

CoordSys Earth Projection 8, 79, "m", -2, 49, 0.9996012717, 400000, -100000 Bounds(4.17232513428e011, 7.7486038208e-011) (700000, 1300000)

This information relates to the Transverse Mercator projection, its position relative to the rest of the world and also an individual tile's position relative to the projection. The record header is constructed as follows (not all fields have to be used):

Table 2: Components of the MIF record header.

| MIF record header component | Description |
|---|--|
| CoordSys Earth Projection 8 | The 8 relates to a MapInfo identifier, which in this case is the Transverse Mercator projection. |
| 79 | A MapInfo identifier; in this case, this relates to Ordnance Survey of Great Britain 1936, Airy ellipsoid. |
| "m" | This relates to the unit of measurement, which in this case is metres. |
| -2 | This is the origin of the projection in respect of longitude. |
| 49 | This is the origin of the projection in respect of latitude. |
| 0.9996012717 | This figure indicates the distortion of the tile at the central meridian. A value of 1.0 would indicate no distortion at all. However, distortion within this projection is minimal, even at the far western or eastern limits. |
| 400000, -100000 | These figures indicate the false origin of the British National Grid. They represent the south-west corner of the Transverse Mercator projection which overlays Great Britain, so all coordinates for any tile, no matter what scale, will always be positive. |
| Bounds(4.17232513428e-011, 7.7486038208e-011) | These values represent the minimum bounding X and Y coordinates for the tile. |
| (700000, 1300000) | These values represent the maximum bounding X and Y coordinates for the tile. |

4. Image file directory (TIFF)

The image file directory for TIFF will contain a selection of the following entries:

- **File Byte Order:** OS defaults to the use of MM = Motorola Byte Order; the order in which the data is interpreted.
- **Tag 256 (ImageWidth):** The number of columns in the image, i.e. the number of pixels per row, for example, value = 4000.
- **Tag 257 (ImageLength):** The number of rows of pixels in the image, for example, value = 4000.
- **Tag 258 (BitsPerSample):** The number of bits per component, for example, value = 8.
- **Tag 259 (Compression):** Compression scheme used on the image data, for example, value = 5 (LZW).
- **Tag 262 (PhotometricInterpretation):** The colour space of the image data, for example, value = 3 (Palette).
- **Tag 270 (ImageDescription):** A string that describes the subject of the image, for example, value = I:50 000 TILE SU40.
- **Tag 273 (StripOffsets):** For each strip, the byte offset of that strip, for example, first four values = 5640 19678 35692 51409.
- **Tag 277 (SamplesPerPixel):** The number of components per pixel.
- **Tag 278 (RowsPerStrip):** The number of rows in each strip, for example, value = 8.
- **Tag 279 (StripByteCounts):** For each strip, the number of bytes in that strip after compression, for example, first four values = 14038 16014 15717 15442.
- **Tag 282 (XResolution):** The number of pixels per Resolution Unit in the Image Width, for example, value = 254.
- **Tag 283 (YResolution):** The number of pixels per Resolution Unit in the Image Length, for example, value = 100/1.
- **Tag 284 (PlanarConfiguration):** Look-up table, for example, value = first four values = 22873 31354 39321 59110.
- **Tag 296 (ResolutionUnit):** How the components of each pixel are stored.
- **Tag 306 (DateTime):** Date and time of image creation, for example, value = 2007:06:30 12:38:41.
- **Tag 317 (Predictor):** A mathematical operator that is applied to the image data before an encoding scheme is applied.
- **Tag 320 (ColourMap):** Look-up table, for example, value = first four values = 22873 31354 39321 59110.
- **Tag 339 (SampleFormat):** Specifies how to interpret each data sample in a pixel.

- **Tag 33432 (Copyright):** Copyright notice, for example, value = ORDNANCE SURVEY CROWN COPYRIGHT 2019.

Note: The preceding values are relevant to 1:50 000 scale TIFF data with LZW compression.

Annex A: Glossary

The purpose of this annex is to provide a glossary of terms used in the definition of products, services, licensing and other terms and conditions for 1:50 000 Scale Colour Raster.

American Standard Code for Information Interchange (ASCII)

A standard binary coding system used to represent characters within a computer.

Binary digit (bit)

The smallest possible unit of data, resulting from a choice between 0 and 1.

Boundary

A boundary forms the division between two similar real-world objects, for example, property boundary or administrative boundary, and is defined by one or more lines.

Byte

A unit of computer storage of binary data, usually comprising 8 bits, equivalent to a character.

Character

A distinctive mark; an inscribed letter; one of a set of writing symbols.

Character code

The binary representation of a single element of a character set; for example, EBCDIC, ASCII.

Coordinate pair

A coordinate pair is an easting and a northing.

Coordinate transformation

A computational process of converting an image or map from one coordinate system to another.

Compact disc (CD)

Read-only memory (CD-ROM). A data storage medium. A 12-cm disc similar to the audio CD. It is an alloy disc pitted with tiny holes and then coated in plastic. A laser head reads the pattern of the holes and translates them into binary data.

Copyright

The sole legal right to print or publish a work. Crown Copyright subsists in all Ordnance Survey publications for a 50-year period, from the end of the year in which they were first published, by virtue of the *Copyright Designs and Patents Act 1988*.

Customer

An organisation or individual that makes use of Ordnance Survey's data supply facilities. This includes both direct sales customers of Ordnance Survey as well as customers of Licensed Partners. It does not include anyone, or any organisation, that has access to Ordnance Survey material without charge.

Data

A representation of facts, concepts or instructions in a formalised manner suitable for communication, interpretation or processing.

Database

An organised, integrated collection of geographic data, which may or may not be spatial data. It is stored so that specific applications can access the data by different logical paths. A database is accessed and managed by a database management system (software for managing database information).

Data format

A specification that defines the order in which data is stored or a description of the way data is held in a file or record.

Data quality

Attributes of a dataset that define its suitability for a particular purpose, such as completeness, positional accuracy, currency and so on.

Data structure

The defined logical arrangement of data as used by a system for data management; a representation of a data model in computer form.

Data transfer medium

This is the means by which computer files are transferred from one computer to another. Transfer media may be subdivided into communications media and physical media.

Dataset

Data as supplied in a particular format to customers, whether internal or external to Ordnance Survey.

Density

A measure of the number of units of data held on a stated length of storage surface. For example, some magnetic tapes may be recorded at a density of 1,600 bits per inch (bpi). Often referred to as packing density.

Delivery mechanism

The method of supply of data to a customer (such as offline and online).

Descriptive name

A name describing a real-world object or feature (for example, School) as shown on the 1:50 000 Scale Colour Raster map.

Definitive name

The name as shown on the 1:50 000 Scale Colour Raster map.

Digital

Data that is expressed as numbers (digits) in computer-readable form.

Digital update

The supply of revised digital data to a customer at a predetermined interval of time.

Direct sale

A direct transaction between Ordnance Survey and a customer.

Distinctive name

A text feature which forms a name that distinguishes it from other text features of the same type, for example, Millbrook School.

Dots per inch (dpi)

The resolution, or fineness, of a raster image.

Digital Versatile Disc (DVD)

A data storage medium.

Eastings

See [rectangular coordinates](#).

JPEG

An image named after the Joint Photographic Experts Group, which uses a lossy compression format. It is designed for compressing full colour or greyscale images of natural, real-world scenes and works well on photographs. It is the de facto standard for photographs on the web.

Encoding

The process of converting information to a computer-readable form, for example, digitising maps.

Feature

A geographic entity such as a building or stream, either taken from a map or surveyed directly from the real world. Can be a point / symbol, text or line.

Format

The specified arrangement of data, for example, the layout of a printed document, the arrangement of the parts of a computer instruction, the arrangement of data in a record.

Generalisation

The cartographic process of simplifying the depiction of features to fit the output scale. For example, road widening is necessary at smaller scales to enhance their visibility.

Geocode

Assigning a geographic location to data, for example, adding coordinates to an address.

Geographic coordinates

Coordinates, usually expressed as latitudes and longitudes, that define a point's position on the Earth's surface.

Georef

A definition for registering raster images within a geographic framework is the process of assigning map coordinates to the raster image data and resampling the pixels of the image to conform to the map projection grid.

GeoTIFF

GeoTIFF (Geographic Tagged Image File Format) is a public domain and OGC metadata standard. It is a TIFF image file with georeferencing information embedded in the file metadata. It can be utilised by a geographic information system (GIS). All GeoTIFF raster tiles are LZW compressed.

Gigabyte (Gb)

1 073 741 824 bytes, a measure of data storage capacity (see [megabyte](#)).

Kilobyte (Kb)

1,024 bytes, a measure of data storage capacity.

Licensed Partner

Any organisation that has entered into a formal licence agreement with Ordnance Survey to market map information or to incorporate map data with their application or service.

Linear feature

Map feature in the form of a line (for example, river and boundary) that may or may not represent a real-world (existent) feature.

Local origin

The local origin of rectangular coordinates is the south-west corner of the 1 km by 1 km National Grid square they identify.

Map scale

The ratio between the extent of a feature on the map and its extent on the ground, normally expressed as a representative fraction, for example, 1:1,250, 1:50 000 and so on.

Megabyte (Mb)

1 048 576 bytes, a measure of data storage capacity (see [gigabyte](#)).

MIF

MapInfo format.

National Grid

The metric grid on the Transverse Mercator projection used by Ordnance Survey on all post-Second World War mapping to provide an unambiguous spatial reference in Great Britain for any place or entity, whatever the map scale.

Northings

See [rectangular coordinates](#).

Origin

The zero point in a system of [rectangular coordinates](#).

Pixel

In the 1:50 000 Scale Colour Raster product, a pixel is a single point represented by a square.

Points

A pair of coordinates.

Raster data

Attribute data expressed as an array of pixels, with spatial position implicit in the ordering of the pixels.

Real-world object

The real-world feature represented by a feature, for example, a building, a fence, a wood.

Rectangular coordinates

Also known as XY coordinates and as eastings and northings. These are two-dimensional coordinates that measure the position of any point relative to an arbitrary origin on a plane surface (for example, a map projection, a digitising table or a VDU screen).

Stipple

Used to produce light or dark shading (for example, building / water fill); this is dependent on the spacing of the dots – the denser the dots, the darker the effect.

String

A set of items that can be arranged into a sequence according to a rule.

Supply format

The file format in which the data is supplied to the customer.

TAB

MapInfo format.

Tag

Tags are unique numbers that are used for identifying specific information in TIFF files, for example, image width, image length, bits per sample, photo interpretation and resolution.

Terminator

Character, or character string, or field or record used to signal the end of a record, or section, or volume or database.

Tile

A unit of map used to divide large areas into regular and more manageable sizes.

TIFF

TIFF is a tagged image file format-based file format for storing and interchanging raster images with the most recent version (6.0) published in 1992.

Transfer format

The format used to transfer data between computer systems. In general usage, this can refer not only to the organisation of data but also to the associated information, such as attribute codes, which are required in order to successfully complete the transfer.

Transfer medium

The physical medium on which digital data is transferred from one computer system to another. For example, compact disc.

UNIX®

An operating system that supports multitasking and is used by many workstations and minicomputers.

Update

The process of adding to and revising existing digital map data to take account of change.

Volume

A physical unit of the transfer medium that is a single disk, or a single DVD.