Code-Point Open – Technical Specification

Ordnance Survey

Version History

Version	Date	Description
2.2	28/11/2019	Updated contact details

Purpose of this Specification

This is the Technical Specification (hereinafter referred to as the 'Specification') for the Code-Point Open product (hereinafter referred to as the 'Product').

We may change the information in this Specification at any time.

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Contact Details

For any questions regarding this product please contact us via our website: www.os.uk/contact-us.

Contents

1.   Introducing Code-Point Open

Code-Point Open is a dataset that contains postcode units, each having a precise geographical location. There are about 1.7 million postcode units in England, Scotland and Wales.

Code-Point Open is a data product and does not include software for analysis but can be used with a variety of programs. Code-Point Open can be loaded onto any desktop PC. Consult your geographical information system (GIS) vendor to establish actual system requirements.

Purpose

The purpose of this document is to provide detailed technical information about Code-Point Open.

Resources

The following documents are associated with Code-Point Open:

1.   Code-Point Open User Guide

2.   Code-Point Open Technical Specification

Target Audience

This document is intended for:

- Users with technical knowledge in GIS.

Glossary of Terms

- A glossary of terms and abbreviations can be found in Annexe A - Glossary.

Feedback

Ordnance Survey welcomes all feedback. If you have any comments or require further information, please make contact using the details above or via our website.

2.   Code-Point Open

2.1   Requirements to use Code-Point Open

Supply definition

Code-Point Open is only available as national cover of Great Britain and is supplied by DVD or download.

Update

Updates are supplied quarterly and provided as a complete resupply, but do not include deleted postcodes.

File sizes

File sizes for Great Britain are approximately: comma separated values (CSV) – 190 Mb, GeoPackage – 260 MB

Code-Point Open data structure - CSV

There are two folders in the root directory: *DOC* and *Data*.

The *Doc* folder contains the following files:

- LICENCE.TXT – important licence information
- CODELIST.XLS – lookup table of GSS codes
- NHS_CODELIST.XLS – lookup table of health GSS Codes
- METADATA.TXT – number of postcode units in each postcode area
- Code-Point Open column headers – description of column headers

The *Data* folder contains the following sub-folders:

- *CSV* – Contains 120 postcode area files in CSV format.

Code-Point Open data structure - GeoPackage

A file containing ~1.7 million postcodes and their notional point geometry is supplied. The lookup tables for GSS Codes (Codelist.xls) and health codes (NHS Codelist.xls), as well as the Licence.txt file can be found under Useful Downloads at https://www.ordnancesurvey.co.uk/business-and-government/help-and-support/products/code-point-open.html

2.2   Structure of Code-Point Open DVD and download

CSV

```
ROOT
  │
  ├── Doc
  │     │
  │     ├── Licence.txt
  │     ├── Codelist.xlsx
  │     ├── NHS_Codelist.xls
  │     ├── Metadata.txt
  │     └── header.csv
  │
  ├── Data ── CSV
  │
  └── Readme.txt
```

GeoPackage
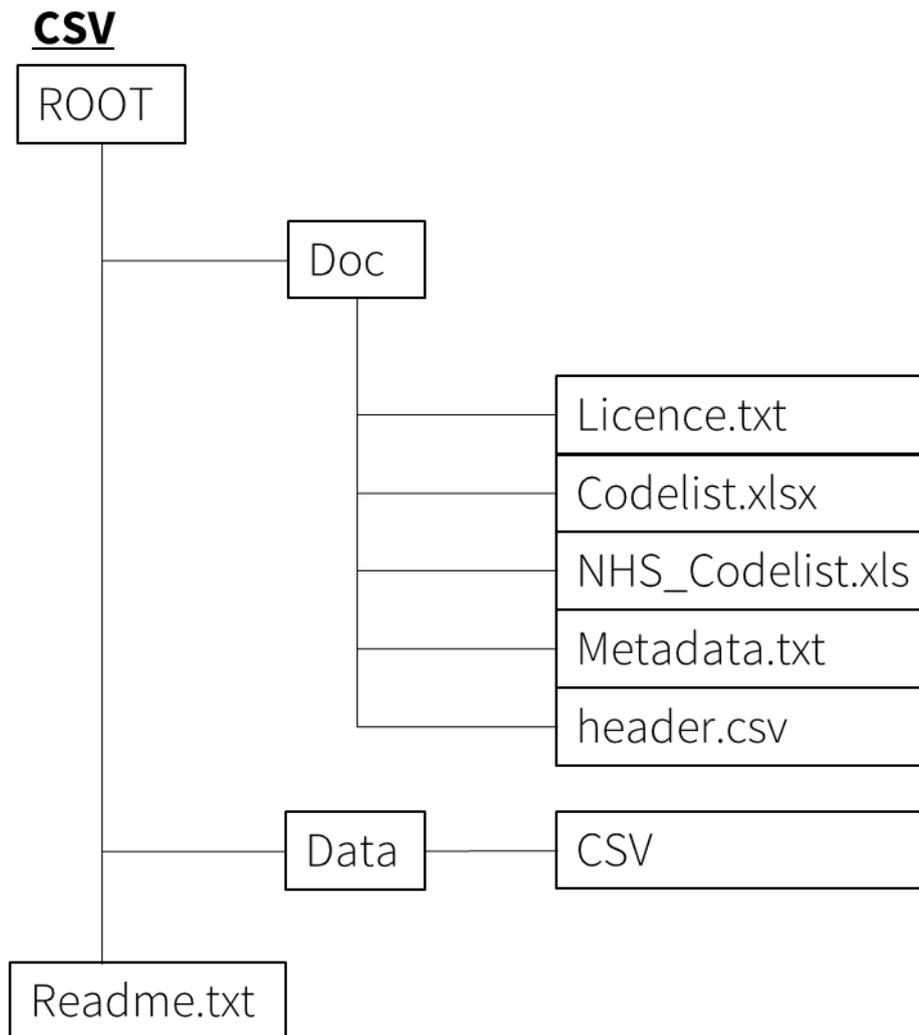
```
ROOT ── Data ── GeoPackage
```

2.3   Code-Point Open content

Code-Point Open provides the following data:

- Postcode unit
- Positional quality indicator
- Easting*
- Northing*
- Country code
- National Health Service health authority code**
- National Health Service regional health authority code**
- Administrative ward code**
- Administrative district code**
- Administrative county code**

*These are not supplied as attributes in the GeoPackage format. These are within the associated geometry.

** The attribute is blank when the entity does not have a code. The Welsh Local Health Boards are included in Code-Point Open.

2.4   Formats

Code-Point Open is available in comma-separated values (CSV) or GeoPackage.

CSV

CSV is a common interchange format for spreadsheets and databases, and facilitates a simplistic use of Code-Point Open. Each field is either textual, for example SO515RU, or numeric, for example 21. Within the CSV each field is separated from the next by a comma. If the field is textual, then the text is enclosed in double quotes, for example, "SO515RU".

This method of representation can also be referred to as a comma delimited file (CDF). All coordinate values within Code-Point Open are given with a precision of 1 metre.

For convenience, this is referred to as CSV throughout. The structure of Code-Point Open supplied in CSV is described in Chapter 2 of this technical specification.

GeoPackage

GeoPackage (*.gpkg) is an open, standards based, data format as is defined by the Open Geospatial Consortium (OGC). It is designed to be a lightweight format that can contain large amounts of varied and complex data in a single, easy to distribute and ready to use file.

GeoPackage offers users the following benefits:

- The single file is easy to transfer and offers the end-user a rich experience.

- Attribute names are not limited in length making it more user friendly.

- No file size limit so lots of data can be easily accommodated.

- Supports raster, vector and database formats making it a highly versatile solution.

- It is an OGC Standard.

- In most cases, it is a plug-in-and-play.

GeoPackage was released in 2014 and is still a relatively new format. As a result, some older software packages may have trouble loading it or may need a plugin in order to do so. If this is the case, your version of GIS may need updating. For example, QGIS software, as of version 2.18 (October 2016), can interact with GeoPackage files without needing additional plugins or settings. Earlier versions will either require a plugin or will not be able to interact with this format at all.

3. Record structures for the transfer of Code-Point Open in CSV

3.1 CSV fields

The CSV will contain the following fields separated by commas in the following order:

Mnemonic	Description	Format	Size
PC	Postcode unit	A7	7
PQ	Positional quality indicator	I2	2
EA	Eastings	I6	*
NO	Northings	I7	*
CY	Country code	A9	9
RH	NHS regional health authority code	A9	9
LH	NHS health authority code	A9	9
CC	Administrative county code	A9	9
DC	Administrative district code	A9	9
WC	Administrative ward code	A9	9

Those fields containing text, that is, alphanumeric (A), will be enclosed by double quotes, which have not been included in the sizes listed above. 'I' indicates an Integer Value.

Fields with null data will appear as " " for text or 0 for a numeric.

Each record will be terminated with a carriage return character (ASCII 13) and a line feed character (ASCII 10).

Examples of a Code-Point Open CSV record:

"EX1 1AE",10,291966,92583,"E92000001","E19000002","E18000010","E10000008","E07000041","E05011020"

# 4. Record structure for the transfer of Code-Point Open in GeoPackage

4.1 GeoPackage fields

The GeoPackage will contain the following fields in the following order:

Field name	Description	Format	Size
Postcode	Postcode unit	Text	7
Positional_quality_indicator	Positional quality indicator	smallINT	2
Country_code	Country code	Text	9
NHS_regional_HA_code	NHS regional health authority code	Text	9
NHS_HA_code	NHS health authority code	Text	9
Admin_county_code	Administrative county code	Text	9
Admin_district_code	Administrative district code	Text	9
Admin_ward_code	Administrative ward code	Text	9

The Eastings and Northings value of the Code-Point are not included as an attribute value and are supplied as two-dimensional geometrical points.

Examples of a Code-Point Open record
(attributes shown for the yellow point below):
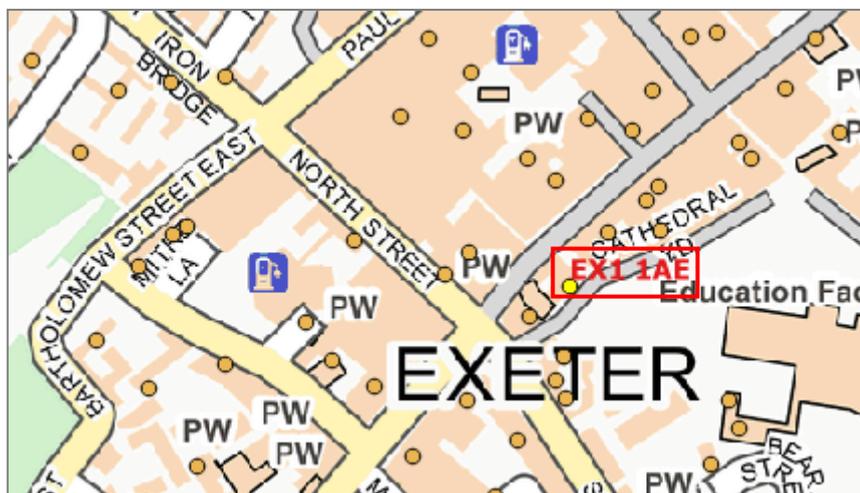
Postcode	Positional_quality_indicator	Country_code	NHS_regional_HA_code	NHS_HA_code	Admin_county_code	Admin_district_code	Admin_ward_code
EX1 1AE	10	E92000001	E19000002	E18000010	E10000008	E07000041	E05011020

Coordinate System

The coordinate system is National Grid. The National Grid coordinates are to a resolution of 1 metre.

Annexe A: Glossary

addressed premise

A permanent or non-permanent building structure with an address being a potential delivery point for Royal Mail.

Examples of an addressed premise could be a house, a flat within a block of flats, a caravan site, a bollard to which several houseboats may be moored, or an organisation occupying the whole of a building.

building

A physical, walled structure connected to foundations that has, or will have, a roof. This definition includes buildings surveyed at foundation stage.

CPLC (Code-Point location coordinate)

A National Grid reference for each postcode unit. It is a two-dimensional coordinated point to a resolution of 1 metre. Coordinates are attributed from Gridlink using an accuracy hierarchy.

Country code

The code used by the Office of National Statistics to indicate the country in which the Code-Point georeference lies. This has replaced the PAF update date field.

CountryCode

Country	Code
England	E92000001
Scotland	S92000003
Wales	W92000004
N Ireland	N92000002

Comma-separated values (CSV)

The CSV file format is commonly used to exchange data between different applications, for example, Microsoft Excel and Access. Being text files, CSV files can also be viewed in *Notepad*.

delivery point

A Royal Mail-defined point to which mail is delivered. This may be a property (private address), organisation, mailbox or even, very rarely, the name of an individual. These categories are derived from the *Programmers' Guide* from Royal Mail. This is distinct from the addressed premise because there may be more than one organisation at an address.

Gridlink

Gridlink is the name given to a joined-up Government initiative involving Royal Mail, the Office for National Statistics, National Records of Scotland (NRS), Land & Property Services and Ordnance Survey. All these organisations are involved in the georeferencing of postcodes and the relating of postcodes to administrative and National Health Service areas and so on.

inward code or incode

See [postcode](#).

matched address

An address, resulting from a match between the OS MasterMap Topography Layer data and PAF, which has been allocated a coordinate position. The match may be a result of either manual or automatic matching, the latter encompassing both full and 'fuzzy logic' matching.

National Grid

A unique referencing system that can be applied to all Ordnance Survey maps of Great Britain (GB) at all scales. It is used by Ordnance Survey on all post-war mapping to provide an unambiguous spatial reference in Great Britain for any place or entity whatever the map scale. The National Grid is defined by the OSGB36 spheroid.

National Grid reference (NGref)

The National Grid provides a unique reference system that can be applied to all Ordnance Survey maps of Great Britain. The map of Great Britain is covered by 100 km by 100 km grid squares, with the origin lying to the west of the Isles of Scilly. When a National Grid reference is quoted, the easting (left to right direction) is always given before the northing (upwards direction).

A National Grid reference (to 1 metre) will identify the spatial position of the [CPLC](#).

non-geographic postcodes

Special non-geographic postcodes are allocated to single organisations who receive an exceptionally large amount of mail. These are included in Code-Point Open.

outward code or outcode

See [postcode](#).

Postcode Address File (PAF)

PAF now contains the postal addresses and postcodes of approximately 28 million delivery points in Great Britain.

Postal Address Location Feed (PALF)

The PAL Feed is provided to Ordnance Survey from GeoPlace, who have geocoded the PAF feed from Royal Mail, using source coordinates from Local Authorities in England, Wales & Scotland and Ordnance Survey.

positional quality indicator (PQI)

The positional quality indicator is a flag used to indicate the positional accuracy of the coordinates allocated to each postcode record. There are seven PQI values for the positional quality of CPLCs.

postal address

A postal address is a delivery point that is currently receiving mail. There may be many delivery points within an individual building structure as shown in OS MasterMap Topography Layer data.

postcode

An abbreviated form of address made up of combinations of between five and seven alphanumeric characters. A postcode may cover between 1 and 100 addresses. The average number of addresses per postcode is 15.

There are two main components of a postcode:

- The outward code (also called outcode). The first two to four characters of the postcode, constituting the postcode area and the postcode district. It is the part of the postcode that enables mail to be sent from the accepting office to the correct area for delivery.

- The inward code (also called incode). The last three characters of the postcode, constituting the postcode sector and the postcode unit. It is used to sort mail at the local delivery office.

For example:

Outward		Inward	
NW	6	4	DP
			Unit
		Sector	
	District		
Area			

postcode area

An area given a unique alphabetic coding by Royal Mail to facilitate the delivering of mail. The area is identified by one or two alpha characters at the start of the full postcode, the letters being derived from a town, city or district falling within the postcode area. There are, at present, 120 postcode areas in Great Britain, for example, SO for Southampton, MK for Milton Keynes, B for Birmingham or W for London West. The postcode area code constitutes the first part of the outward code.

postcode district

A sub-area of the postcode area, specified by the character sub-string within the first half of a full postcode, which may be numeric, alphabetic or alphanumeric; for example, 42 from MK42 6GH or 1A from W1A 4WW. There are approximately 2 986 postcode districts in Great Britain.

NOTE: there are certain non-geographic districts. In these instances, a district code is allocated to cover all large users in the postcode area.

postcode sector

A sub-area of a postcode district, whose area is identified by the number third from the end of a full postcode. There are approximately 11 200 postcode sectors in Great Britain. An example of a postcode sector code is 3, from GU12 3DH.

postcode unit

A sub-area of a **postcode sector**, indicated by the two letters of the **inward postcode**, which identifies one or more **small-user postcode** delivery points or an individual **large-user postcode**. There are approximately 1.7 million postcode units in the UK.