

Spectrum Technology Platform

Version 12.0

Geocoding Guide for Australia - REST



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1 - Enterprise Geocoding Module

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Enterprise Geocoding Module

The Enterprise Geocoding Module performs address standardization, address geocoding, and postal code centroid geocoding. You can enter an address and get outputs such as geographic coordinates, which can be used for detailed spatial analysis and demographics assignment. You can also enter a geocode, a point represented by a latitude and longitude coordinate, and receive address information about the provided geocode.

Components

Enterprise Geocoding Module consists of the following stages. The specific stages you have depend on your license.

- **GeocodeAddressAUS**—Takes an address in Australia and returns latitude/longitude coordinates and other information.

Note: Geocode Address AUS has been deprecated. GNAF PID Location Search is the only stage used from Geocode Address AUS. For all other Australia geocoding functions, use the Geocode Address Global component.

- **GeocodeAddressGBR**—Takes an address in Great Britain and returns latitude/longitude coordinates and other information.

Note: Geocode Address GBR supports the GBR AddressBase Plus data source. Use Geocode Address Global for the GBR Streets (TomTom) data source.

- **GeocodeAddressGlobal**—Takes an address in any supported country and returns latitude/longitude coordinates and other information. Geocode Address Global geocodes addresses only from countries you have licensed. It does not support Australia and Great Britain.
- **Geocode Address**—Takes an address located in any of the supported countries and returns the city centroid or, for some countries, postal centroid. Geocode Address World cannot geocode to the street address level.
- **Geocode Africa**—Provides street-level geocoding for many African countries. It can also determine city or locality centroids, as well as postal code centroids for selected countries.
- **Geocode Middle East** Provides street-level geocoding for many Middle East countries. It can also determine city or locality centroids. Middle East supports both English and Arabic character sets.
- **Geocode Latin America** Provides street-level geocoding for many Latin American countries. It can also determine city or locality centroids. There is postal code coverage for selected countries.
- **GeocodeUSAddress**—Takes an input address and returns latitude/longitude coordinates and other address information.
- **GNAFPIDLocationSearch**—Identifies the address and latitude/longitude coordinates for a Geocoded National Address File Persistent Identifier (G-NAF PID).

- **ReverseAPNLookup**—Takes an Assessor's Parcel Number (APN), Federal Information Processing Standards (FIPS) county code, and FIPS state code and returns the address of the parcel.
- **ReverseGeocodeUSLocation**—Takes as input a geocode (latitude and longitude coordinate) and returns the address of the location.

Enterprise Geocoding Databases

The following Enterprise Geocoding Module databases are installed on the Spectrum™ Technology Platform server. Some of the databases are available by subscription from Pitney Bowes and are updated monthly or quarterly. Others are licensed from the USPS®.

U.S. Geocoding Databases (U.S. Only)

These databases contain the spatial data necessary to perform address standardization and geocoding. You must install at least one of these databases to perform geocoding for USA. You set the database that you want to match against with the processing options. Enterprise Geocoding tries to match to the database you indicate. To verify you are matching to the database you want, you can review the value returned in the StreetDataType output field.

These databases use proprietary files called GSD files. For ZIP Code centroid matching, the file us.Z9 contains all the centroid info for all states and normally has a z9 extension.

- **Centrus Enhanced Geocoding**—This database consists of TIGER data provided by the U.S. Geological Survey and address data provided by the U.S. Postal Service.
- **TomTom Geocoding**—This database provides more up-to-date data than the Centrus Enhanced Geocoding database. It requires an additional license. This data is provided by TomTom, a third-party provider of spatial data, and postal data from the U.S. Postal Service.
- **NAVTEQ Geocoding**—This database provides more up-to-date data than the Centrus Enhanced Geocoding database. It requires an additional license. NAVTEQ data is provided by NAVTEQ, a third-party provider of spatial data. For more information about these databases, contact your sales representative.
- **ZIP + 4 Centroid**—This database provides only address standardization and ZIP + 4 centroid matching. It does not provide street-level matching.

Each geocoding database has an optional Statewide Intersections Index. The Statewide Intersection Index is designed to enable fast intersection identification on a statewide basis. For example, the Statewide Intersection Index will allow the database search for "1st and Main St, CO" and return a list of possible matches in Colorado more quickly than searching the entire geocoding database for each instance of the intersection.

U.S. Points Databases (U.S. Only)

Points databases contain data for locating the center of a parcel. These databases provides enhanced geocoding accuracy for internet mapping, property and casualty insurance, telecommunications, utilities, and others.

These databases are optional, but either Centrus Enhanced Points or Centrus Premium Points is required for Reverse Assessor's Parcel Number (APN) Lookup. These databases are also separately licensed.

- **Centrus Points**—This database contains the data necessary to locate the center of a parcel or building. It does not contain Assessor's Parcel Number (APN) or elevation data.
- **Centrus Elevation**—This database contains the same data as Centrus Points, plus elevation data.
- **Centrus Enhanced Points**—This database contains the same data as Centrus Points, plus APN data.
- **Centrus Premium Points**—This database contains the same data as Centrus Points, plus both APN and elevation data.
- **Centrus TomTom Points Database**—The data in this database is provided by TomTom, a third-party provider of spatial data.
- **Master Location Data** — This database provides the best available address point location for every mailable and deliverable address in the United States.

Reverse Geocoding Database (U.S. Only)

This database contains the data you need to convert a latitude/longitude location to an address.

This database is optional, but is required for ReverseGeocodeUS. This database is also separately licensed.

Auxiliary Files (U.S. Only)

Auxiliary files contain user-defined records. You can use auxiliary files to provide custom data to use in address matching and geocode matching.

DPV® Database (U.S. Only)

The Delivery Point Validation database allows you to check the validity of any individual mailing address in the U.S. The DPV database is distributed as an optional feature and can be installed to enhance the geocoding database's ability to validate mailing addresses. Each time an edition of the geocoding database is released, a corresponding edition of the optional DPV database is released. The date of the DPV database must match the date of the geocoding database for DPV processing to function. DPV lookups may not be performed after the expiration date of the DPV database.

This database is optional, but is required for CASS Certified™ processing. The DPV database is also required to determine ZIP + 4 and ZIP + 4 related output (DPBC, USPS record type, etc.). This database is also separately licensed.

Note:

Postal Service licensing prohibits using DPV for the generation of addresses or address lists, and also prohibits the DPV database being exported outside the United States.

EWS Database (U.S. Only)

The Early Warning System (EWS) database contains data that prevents address records from miscoding due to a delay in postal data reaching the U.S. Postal database.

The USPS® refreshes the EWS file on a weekly basis. Unlike the DPV and LACS^{Link} databases, the EWS database does not need to have the same date as the geocoding database. You can download the EWS.zip file free of charge from the CASS section of the USPS® RIBBS website at:

<https://ribbs.usps.gov/index.cfm?page=doclist>

When you download the EWS database, you will receive a file named OUT. You must rename the OUT file to EWS.txt before using it.

LACS^{Link} Database (U.S. Only)

The LACS^{Link} database allows you to correct addresses that have changed as a result of a rural route address converting to street-style address, a PO Box renumbering, or a street-style address changing.

This database is optional, but is required for CASS Certified™ processing. The LACS^{Link} database is also required in CASS mode to receive ZIP + 4 and ZIP + 4 related output (delivery point bar code, USPS record type, etc.).

The date of the LACS^{Link} database must match the date of the geocoding database for LACS^{Link} processing to function.

Note:

USPS licensing prohibits using LACS^{Link} for the generation of addresses or address lists, and also prohibits the LACS^{Link} database being exported outside the United States.

International Geocoding Databases

International geocoding databases contain the spatial data necessary to perform address standardization and geocoding for locations outside the U.S. Each country has its own database, and some countries have optional databases that provide enhanced geocoding.

United Kingdom AddressBase Premium Database

AddressBase Premium is a point database sourced from Ordnance Survey®, Royal Mail, and local authorities.

The AddressBase Premium database provides the highest level of precision, as reflected in S8 result codes. The database includes objects without postal addresses, such as subdivided properties, places of worship and community centers.

The AddressBase Premium database is built around the UPRN (Unique Property Reference Number). The UPRN is the unique identifier that provides a persistent reference to a unique property, regardless of changes in the property name, status, subdivision, use (such as from single occupancy to multiple occupancy) or demolition of the property. All historic, alternative, and provisional addresses are recorded against the same UPRN. The UPRN is returned with every AddressBase Premium candidate, except for Northern Ireland addresses.

Since the Ordnance Survey data source does not contain addresses for Northern Ireland, AddressBase Premium is supplemented with Royal Mail® postcode address data for Northern Ireland. This Northern Ireland data has postcode centroid (result code S3) precision only.

For more information on the AddressBase Premium, see

<https://www.ordnancesurvey.co.uk/business-and-government/help-and-support/products/addressbase-premium.html> from Ordnance Survey.

United Kingdom CodePoint Database

The CodePoint Postal Address File (PAF) database provides postcode centroid geocoding. The CodePoint database is suitable for most applications involving address matching, validation, etc.

The CodePoint database is sourced from Royal Mail and covers street addresses for the UK (Great Britain and Northern Ireland). The CodePoint database is licensed for the entire dataset, rather than by region. The postcode centroid precision provided by the CodePoint database is reflected in S3 result codes.

For more information on the Royal Mail data source, see:

<http://www.royalmail.com>

Australia Geocoded National Address File (G-NAF)

This database provides enhanced geocoding for Australian addresses. This is the only authoritative Australian national index of locality, street and number, validated with geographic coordinates. It contains both officially recognized rural and urban addresses and unofficial addresses (aliases). Postal addresses and PO Boxes are not included. However, because some rural areas do not have adequate rural address information, roadside mail box (RMB) numbers, Lot numbers, and Block & Section numbers have been included in the G-NAF data set.

When you install this database there will be two subfolders:

- **GNAF123**—Contains the point-level dictionary. This has the highest precision of geocoding (characterized by Reliability Level 1, 2, or 3.)
- **GNAF456** —Contains the remainder of address information in G-NAF that does not meet high precision geocoding criteria (characterized by Reliability Level 4, 5, or 6.)

You must specify each of these as separate database resources in the Management Console.

We recommend that you use both databases to validate the existence of addresses but only use the GANF123 for parcel-level geocoding. If you do not require parcel-level geocodes you can use the GANF456 database for geocoding.

New Zealand Point Database

The New Zealand Point Database is based on postal point data which has a roof top precision point of each unique street address. Location X and Y returned for candidates from this database are roof top precision.

This data is maintained by the government authority, Land Information New Zealand. This database is a monthly update from what the local district councils supply.

Other Point Databases for International Countries

A number of other point databases are available for international countries. In addition to USA, UK, Australia, and New Zealand, the Enterprise Geocoding Module point databases are available for the following countries:




- Andorra
- Belgium
- Canada
- Czech Republic
- Denmark
- France
- French Guiana
- Germany
- Gibraltar
- India
- Ireland
- Japan
- Luxembourg
- Malaysia
- Martinique
- Mayotte
- Mexico
- Monaco
- Morocco
- Netherlands
- Portugal
- Reunion
- Singapore
- Slovakia
- Spain
- Sweden

Additional point databases may be available in future releases. Contact your sales representative for information on licensing the Enterprise Geocoding Module point databases.

Adding an Enterprise Geocoding Module U.S. Database Resource

Whenever you install a new database resource or modify an existing database resource you must define it in Management Console in order for it to become available on your system. This procedure describes how to add or modify a U.S. database resource for the Enterprise Geocoding Module.

1. If you haven't already done so, install the dataset files on your system. For instructions on installing databases, see the *Spectrum™ Technology Platform Installation Guide*.
2. In Management Console, under **Resources**, choose **Spectrum Databases**.

- To create a new database resource, click the Add button . To make changes to an existing database resource, select it, then click the Edit button . To delete a database resource, select it, then click the delete button .
- If you are creating a new database resource, on the **Add Database** page, enter a name for the database resource in the **Name** field. The name can be anything you choose. If you are creating a new database by copying an existing one, rename the default name as needed. You cannot modify the name of an existing database resource, because any services or jobs that reference the database resource by its original name would fail.



Note: If you are using the Enterprise Geocoding Module with the Siebel Module, name the U.S. geocoding database **KGDDatasource**.

- In the **Pool size** field, specify the maximum number of concurrent requests you want this database to handle.






The optimal pool size varies by module. You will generally see the best results by setting the pool size between one-half to twice the number of CPUs on the server, with the optimal pool size for most modules being the same as the number of CPUs. For example, if your server has four CPUs you may want to experiment with a pool size between 2 (one-half the number of CPUs) and 8 (twice the number of CPUs) with the optimal size possibly being 4 (the number of CPUs).

When modifying the pool size you must also consider the number of runtime instances specified in the dataflow for the stages accessing the database. Consider for example a dataflow that has a Geocode US Address stage that is configured to use one runtime instance. If you set the pool size for the US geocoding database to four, you will not see a performance improvement because there would be only one runtime instance and therefore there would only be one request at a time to the database. However, if you were to increase the number of runtime instances of Geocode US Address to four, you might then see an improvement in performance since there would be four instances of Geocode US Address accessing the database simultaneously, therefore using the full pool.

Tip: You should conduct performance tests with various settings to identify the optimal pool size and runtime instance settings for your environment.

- In the **Module** field, select `GeoStan`. The **Type** field, `US Geographic Coders`, is selected by default.
- To add a new dataset, under **Data Source**, click the Add button . In the **Path** field, specify the folder that contains the dataset files. You can type in a path or click the Browse button  to locate the dataset you need, then click **Ok**. You can include multiple dataset paths. This allows you to specify a single resource that includes both the primary dataset and any optional datasets you may have, such as DPV, LACS^{Link}, or elevation data.

For DPV and LACS^{Link} datasets, the interface provides Yes/No indicators on whether DPV and LACS^{Link} data are detected in any of the defined paths for the database resource.

8. If you have additional datasets to add, click the Add button . To edit a dataset path, select the dataset, then click the Edit button . To remove a dataset, select the dataset, then click the delete button .
9. If you have multiple datasets and want to reorder them, select a dataset and click the Up  or Down  button to move the file in the dataset list.

Note: The order of the datasets sets the priority of the dataset to use when a match is made to multiple same-level datasets; for example, a match made to 2 streets datasets. In this case, the dataset listed higher will be used.

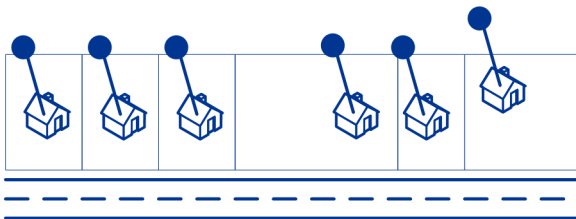
10. When you are done with your changes, click **Save**.

Geocoding Concepts

Geocoding is the process of determining the latitude/longitude coordinates of an address. There are different ways that an address can be geocoded. In order of most accurate to least accurate, these methods are:

Point Level Matching

Point-level matching locates the center of the actual building footprint or parcel. This is the most accurate type of geocode and is used in industries such as internet mapping, insurance, telecommunications, and utilities.



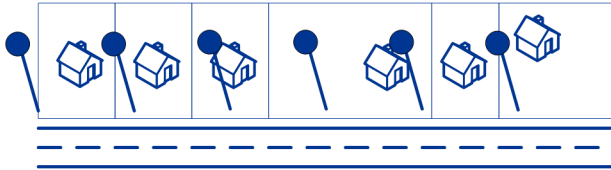
Centerline matching is used with point-level matching to tie a point-level geocode with its parent street segment. This provides you with additional data about the parent street segment that is not retrievable using only the point-level match. The output information also includes the bearing from the point data geocode to the centerline match.

Street Matching

Street matching identifies the approximate location of an address on a street segment. In street matching, the location is determined by calculating the approximate location of a house number based on the range of numbers in the location's street. For example, if the address is on a street segment with a range of addresses from 50 to 99, then it is assumed that the house number 75 would be in the middle of the street segment. This method assumes that the addresses are evenly

spaced along the street segment. As a result, it is not as exact as point matching since addresses may not be evenly distributed along a street segment.

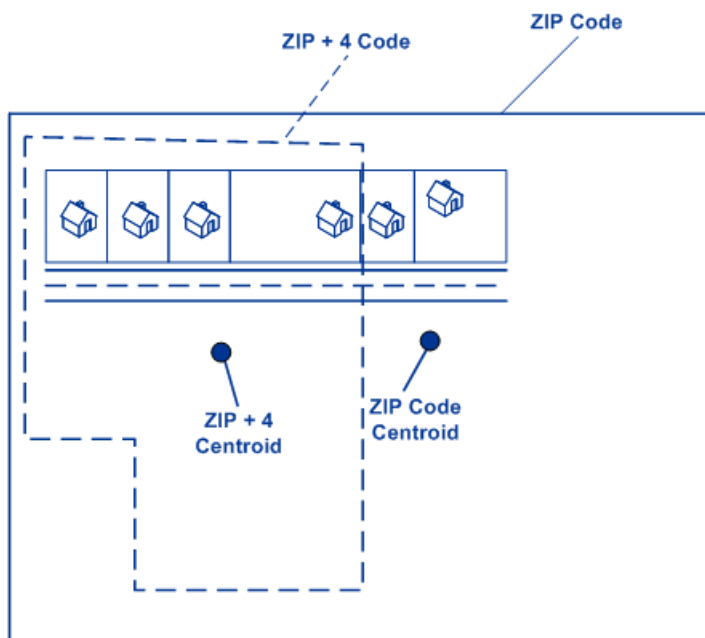
For example, the following diagram shows the results of street-level matching along a segment with unevenly-spaced buildings. The first three buildings are fairly accurately geocoded because they are evenly spaced. The fourth building, however, resides on a slightly larger parcel than the others along this street. Since street-level matching assumes that the buildings are evenly spaced, the result is that fourth, fifth, and sixth houses are not as precise as the first three. If you were to use point-level geocoding, the results would be more accurate.



Centroid Matching

ZIP Code centroid matching is a center point of an area defined by either a ZIP Code or a ZIP + 4, and is the least accurate type of geocode. A ZIP Centroid is the center of a ZIP Code; a ZIP + 4 centroid is the center of a ZIP + 4. Since a ZIP + 4 represents a smaller area than a ZIP Code, a ZIP + 4 centroid is more accurate than a ZIP Code centroid.

The following diagram illustrates centroid matching. All six houses would have the same geocode in this example because they all reside in the same ZIP + 4 code.



Geocoding Match Strategies for Non-U.S. Locations

The Enterprise Geocoding Module offers a variety of options for controlling geocoding precision and match rate. The following information describes different approaches for matching which you can apply to any country geocoder except the U.S. geocoder (GeocodeUSAddress), which has a different set of options.

Maximizing the Match Rate

To generate the highest match rate possible, do not specify house number, street, and city/locality.

Another way to maximize the match rate is by setting . This means that the geocoder will fall back to the four-digit postcode centroid if a close street level match cannot be made. While this scenario might yield false positives, it may be the best matching solution when you have large databases to geocode.

You should evaluate if the percentage of false positives will affect your analysis. To reduce the number of false positives without sacrificing hit rate, analyze the result codes after a geocoding session and adjust your settings accordingly.

Maximizing Precision

If your analysis requires highly precise geocoded addresses, choose a strategy in which the geocoder returns the maximum percentage of high precision geocodes and the lowest number of imprecise matches (false positives). To do this, use the to require close matches to match on all address elements. Also, set .

This technique may produce a lower percentage match rate, but will provide the best precision.

Balancing Match Rate and Precision

You may want to use a balanced strategy between match rate and geographic precision. That is, you may want to geocode as many records as possible automatically, but at the same time want to minimize the number of weaker matches (false positives). For example, false positives can occur when the geocoder:

- finds a street that sounds like the input street.
- finds the same street in another city (if postal code match is not required).
- finds the street but with a different house number (if house number is not required).

The following settings may achieve a good balance between match rate and precision:

- **CloseMatchesOnly**—Specify "Y".
- **MustMatchHouseNumber**—Specify "Y".
- **MustMatchStreet**—Specify "Y".
- **FallbackToPostal**—Specify "N".

2 -

GeocodeAddressAUS

GeocodeAddressAUS takes an address or street intersection in Australia and returns the geographic coordinates. GeocodeAddressAUS can geocode to street addresses and postal code centroids.

GeocodeAddressAUS is an optional part of the Enterprise Geocoding Module. For more information about Enterprise Geocoding Module, see [Enterprise Geocoding Module](#) on page 4.




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Adding an Enterprise Geocoding Module Database Resource for Australia

Whenever you install a new database resource or modify an existing database resource you must define it in Management Console in order for it to become available on your system. This procedure describes how to add or modify a database resource for the Enterprise Geocoding Module for Australia.



To create a Geocode Address AUS database resource:

1. If you haven't already done so, install the database files on your system. For instructions on installing databases, see the *Spectrum™ Technology Platform Installation Guide*.
2. In Management Console, under **Resources**, choose **Spectrum Databases**.
3. Click the Add button  to create a new database or select an existing database resource then click the Edit button  to change it. You can also create a new database resource by copying an existing one, by clicking the Copy button .
4. If you are creating a new database, enter a name for the database resource in the **Name** field. The name can be anything you choose. If you are creating a new database by copying an existing one, rename the default name as needed. You cannot modify the name of an existing database resource, because any services or jobs that reference the database resource by its original name would fail.
5. In the **Pool size** field, specify the maximum number of concurrent requests you want this database to handle.

The optimal pool size varies by module. You will generally see the best results by setting the pool size between one-half to twice the number of CPUs on the server, with the optimal pool size for most modules being the same as the number of CPUs. For example, if your server has four CPUs you may want to experiment with a pool size between 2 (one-half the number of CPUs) and 8 (twice the number of CPUs) with the optimal size possibly being 4 (the number of CPUs).

When modifying the pool size you must also consider the number of runtime instances specified in the dataflow for the stages accessing the database. Consider for example a dataflow that has a Geocode US Address stage that is configured to use one runtime instance. If you set the pool size for the US geocoding database to four, you will not see a performance improvement because there would be only one runtime instance and therefore there would only be one request at a time to the database. However, if you were to increase the number of runtime instances of Geocode US Address to four, you might then see an improvement in performance since there would be four instances of Geocode US Address accessing the database simultaneously, therefore using the full pool.

Tip: You should conduct performance tests with various settings to identify the optimal pool size and runtime instance settings for your environment.


6. In the **Module** field, select International Geocode Australia.
7. In the **Type** field, select Geocode Address AUS.
8. Click the Add button  to install a new dataset. In the **Name** field, specify a name for this database resource. In the **Path** field specify the folder that contains the database files. You can type in a partial path and click the Browse button  to drill down into the file structure to locate the datasets you need.

Datasets are typically found in: `<InstallLocation>\IGEO-<CountryCode>\data`, where `<InstallLocation>` is the directory you specified when you installed the datasets and `<CountryCode>` is the two-letter country code. Some countries may have multiple datasets in the data directory, some of which you may have licensed and some you may have not. Only specify the location of the data you have licensed.

For the Australia Geocoded National Address File (G-NAF) database, you must specify separate database resources for the GNAF123 and GNAF456 folders. We recommend that you use both databases to validate the existence of addresses but only use the GANF123 for parcel-level geocoding. If you do not require parcel-level geocodes you can use the GANF456 database for geocoding.

Note: You must enter the datasets in the order you want them. Reordering datasets is currently not supported in Management Console. You can reorder them in Enterprise Designer or from the command line. Management Console will honor the new order.

Note: If you are specifying a path for a user-defined database you must specify a path to a Pitney Bowes provided database first. The first path in all database resources must be a path for a Pitney Bowes provided database.

9. If you have additional datasets to add, click the Add button , otherwise click **Save**.
10. Click **OK** to leave the Add Database page.

Input

Input Fields

GeocodeAddressAUS takes an address or intersection as input. To obtain the best performance and the most possible matches, your input address lists should be as complete as possible, free of misspellings and incomplete addresses, and as close to postal authority standards as possible. Most postal authorities have websites that contain information about address standards for their particular country.

The following table lists the input fields used for geocoding locations in Australia.

Table 1: Input Fields for Australia

Parameter	Description
Data.AddressLine1	<p>One of the following:</p> <ul style="list-style-type: none"> The address line containing the street name and building number. For example: 4360 DUKES RD KALGOORLIE WA 6430 The full address. For more information, see Single Line Input on page 20 A street intersection. To specify a street intersection, use double ampersand (&&) to separate the streets. For more information, see Street Intersection Input on page 20.
Data.City	The city or town name. Your input address should use the official city name.
Data.County	The Local Government Authority (LGA) name.
Data.FirmName	<p>Company name. For example:</p> <p>Pitney Bowes 4360 Dukes Rd Kalgoorlie WA 6430</p>
Data.HouseNumber	<p>The building number. You may get better parsing results for some countries if you put the house number in this field instead of AddressLine1. For the best results, use the HouseNumber input field for these countries: India, Singapore, Malaysia, Thailand, and Turkey when using multi-line input.</p> <p>Note: The house number specified in the HouseNumber field takes precedence over any house number specified in the AddressLine1 field.</p>
Data.LastLine	<p>The last line of the address.</p> <p>4360 DUKES RD KALGOORLIE WA 6430</p>

Parameter	Description
Locality Data.Locality	Generally a locality in rural areas or suburb in urban areas, used on the lastline of the address with the postcode.
Data.PostalCode	The postal code in the appropriate format for the country. Australia uses a four-digit postal code system. In general, the first digit represents a state or territory, the second digit represents a region with a state, and digits three and four representing towns. For more information, see Address Guidelines for Australia on page 18.
Data.StateProvince	The state name.

Address Guidelines for Australia

Follow these guidelines to provide input that GeocodeAddressGlobal can successfully geocode. For additional information about Australia addresses, see the Australia Post website: www.auspost.com.au.

- **Required fields**—Addresses must contain either a city or a postal code.
- **House numbers and unit information**—The house number pinpoints the location of the address. Unit input can be in one of two formats, as shown in the following examples:
 - Flat 2, 17 Jones St.
 - Apt 19, 123 Main St., where Apt is the unit type and 99 is the unit number. In this format, you must specify a valid unit type, otherwise the address will not be geocoded correctly. For a listing of valid unit types, see www.auspost.com.au.
 - 99-123 Main St. For an address derived from the G-NAF database, this address is a unique house number and is geocoded as a single delivery point, not as a range.
- **Directional suffixes**—Use directional suffixes wherever possible. This is especially true in towns and cities that consist mainly of numbered streets. These streets can only be distinguished by their directional suffixes and street types. They also distinguish addresses on streets that change direction. For example: 123 Queen St W and 123 Queen St E would have very different coordinates.
- **Street types**—These distinguish different streets of the same name. For example, Main Avenue and Main Street are two entirely different entities. Using types is not essential, but it adds precision to your data. For a listing of street types, see www.auspost.com.au.
- **City/suburb name**—Enter the city/suburb name in the City field. Note that all input addresses must contain either a city or a postal code. If the geocoder does not make a close match on the street in the specified suburb, it can make a close match on the Local Government Area (LGA).

Local Government Area (LGAs) do not encompass all of Australia. For example, LGAs do not cover extensive northern parts of South Australia, a large part of the Northern Territory, and the Australian Capital Territory. An LGA can include a number of official suburbs. It is best to use the suburb name for geocoding purposes, but it is possible to get a match on the LGA (or to return LGA information) in geocoded results.

- **Postal code**—All postcodes consist of four digits. While there are exceptions, the general format of postcodes is as follows:

Note: These are general guidelines, and there are exceptions to these postcode number ranges.

- Digit 1 represents the state or territory, within the following general conventions:

2	NSW
---	-----

2600 and 2900	ACT
---------------	-----

3	VIC
---	-----

4	QLD
---	-----

5	SA
---	----

6	WA
---	----

7	TAS
---	-----

0	NT
---	----

- Digit 2 represents a region within the state. State or territorial capitals usually have a 0 or 1 as the second digit.
- Digits 3 and 4 represent towns. Major towns usually have a 0 as the last digit (or sometimes as the last two digits).

Single Line Input

Instead of entering each address element in separate fields, you may enter the entire address in the AddressLine1 input field.

You can enter addresses in this single-line format:

```
StreetAddress;City;StateProvince;PostalCode
```

Where:

- *StreetAddress* can be house number and street name in either order (with street type immediately before or after the street name).
- *City* is the town.
- *StateProvince* is the postal abbreviation for the state or province.
- *PostalCode* is the complete postcode.

A number of variations in single-line input format are acceptable.

The matching accuracy for single line input is comparable to that of structured address input. The performance of single line input addresses may be slightly slower than that of structured address input.

For best results, use delimiters (comma, semicolon, or colon) between each address element. For example,

```
18 Merivale St, South Brisbane, QLD, 4101
```

If the input address is missing delimiters, spaces are recognized as separators and internal parsing rules identify address elements. In the example above, the address would still successfully geocode even if some or all of the delimiters were missing in the input.

Note: Non-delimited or partially-delimited single line addresses may take longer to geocode and may not produce the same results as delimited single line input. This is especially true for addresses with multi-word street names or cities. To optimize single line geocoding, use delimiters between address elements (particularly between street name and city).

Punctuation is ignored for geocoding purposes.

Guidelines for Single Line Input

- The country is not required. Each country geocoder assumes that the address is in its country.
- Firm information (placename, building name, or government building) is returned if available.

Street Intersection Input

If you enter a street intersection as input, the geocoder will provide the coordinates of the intersection.

To enter an intersection, specify the two street names separated by a double ampersand (&&) in AddressLine1. For example:

AddressLine1: Ocean Ave && New South Head Rd
City: Woollahra

Note: Do not use /, _, -, or any other separator. Intersections must be delimited using a double ampersand (&&) as a separator.

All close match criteria are enforced for intersection geocoding, just as for any street level geocoding.

Address Range Input

Street range data represents a range of house numbers that can possibly exist but are not guaranteed to exist. For addresses derived from the Street Range Address database, house number matching is more relaxed compared to the G-NAF database. Also, the candidate house number may be changed based on how the input house number matches the suffix/range data.

The following table shows geocoding match results with house number ranges from a Street range data source:

Input House Number	Candidate House Number Range	Candidate House Number	Match or Non-Match
10	10-12	10	Match
10A	10-12	10	Match
10	8-12	10	Match
10-14	10-12	10	Match
10-14	10-20	10-14	Match
10	12-16	12	Non-Match

G-NAF Range Address Matching

Australian addresses originating from the G-NAF database may contain house number ranges, but these records still represent single address delivery points. These range addresses may also have alphabetic suffixes. For example, the following house address numbers each represent a single address.

10-12 10A-10C 10-10A

GeocodeAddressAUS validates and geocodes these point source addresses. If the criteria are met and the reliability of the match is 1 or 2, GeocodeAddressAUS returns point matches with an S8 result code. See the description of the output field AUS.GNAF_Reliability in [G-NAF Output](#) on page 67 for information about reliability levels.

If a complete house number range/suffix is specified for input, candidates from a point data source must be fully matched. If partial house number information is given (without complete range or suffix information), then candidates with non-conflicting range/suffix information (or no range/suffix information) will match.

The following table shows geocoding match results with house number ranges from a point data source (G-NAF database.). The matching rules are based on the Address Matching Approval System (AMAS[®]) developed by Australia Post.

Table 2: Range Match Results

Input House Number	Data House Number	Candidate House Number	Match or Non-Match
10	10A	10A	Match: Input number 10 matches 10A (or 10 with any suffix).
10A	10	10	Match: Input number 10 matches.
10C	10A	10A	Non-Match: Input suffix does not match the data suffix.
10	10-12	10-12	Match: Input number 10 matches the first number of the dashed data range.
12	10-12	10-12	Match: Input number 12 matches the last number of the dashed data range.

Input House Number	Data House Number	Candidate House Number	Match or Non-Match
10A	10-12	10-12	Match: Input number 10 matches the first number of the dashed data range. Input suffix is not in data, but this does not affect matching.
12	10-14	10-14	Non-Match. Input number 12 does not match either number of the dashed data range. No interpolation is performed on a house number ranges.
10-12	10-14	10-14	Match: First input number 10 matches the first number of the data and the second number 12 is within the data range.
10-12	10A-14A	10A-14A	Match: The input has no suffix information, but the input number 10 matches.
10-16	10-12	10-12	Non-Match: Input second number 16 is outside the 10-12 data range.
10-13	10-14	10-14	Non-Match: Both input numbers are within data range, but second number (13) is odd and this does not match with the even range of 10-14.
10-13	10-15	10-15	Match: Data range (10-15) suggests a mixed odd/even range, so input is matched.
RMB 10	10	10	Match: Input number matches
16	A16	A16	Match: Input number matches
RMB 10	A10	A10	Non-Match: Input suffix does not match the data suffix.

Specifying Unit Information in an Address

When you use the G-NAF database, the geocoder recognizes several formats of unit types (such as unit, suite, floor, and flat address prefix) in an address, as illustrated below:

- "Unit 5 6 Macleay Street"—Full unit description used in conjunction with unit value and address number.
- "U 5 6 Macleay Street"—Abbreviated unit description used in conjunction with unit value and address number.
- "5/6 Macleay Street"—No Unit abbreviation with unit number and address number separated by a forward slash notation.

Exact matches on unit and address are placed first in the list of returned candidates.

Specifying Level Information in an Address

If you use the G-NAF database the geocoder can return level information for some addresses. Level information identifies the floor or level of a multi-storey building. The G-NAF database includes level information for some Australian states. Level information may be associated with unit information, but not necessarily. If the G-NAF database contains multiple records with the same level, the level information is returned only if the input address contains unique content (such as a unit number).

If the G-NAF database has level information for an address, the geocoder returns that information with the matched candidate. The correct level information is returned (when available) even if the input address did not include level information, or if the input had the wrong level information.

If the input address has level information but the G-NAF database does not include level information for the matching address, then the input level information is discarded since it is not validated in the G-NAF data.

Following are several examples of partial addresses that contain level information. The level information is indicated in bold.

Suite 3 **Level 7**, 17 Jones Street (Suite 3 is a unit)

Floor 2, 17 Jones Street

Level 7, 17-19 Middleborough Road

Options

Geocoding Options

The following table lists the options that control how a location's coordinates are determined.

Table 3: Geocoding Options for Australia

Parameter	Description
Option.GeocodeLevel	<p>Specifies how precisely you want to geocode addresses. One of the following:</p> <p>StreetAddress The geocoder attempts to geocode addresses to a street address, but some matches may end up at a less precise location such as a postal code centroid, intersection, or shape path.</p> <p>PostalCentroid The geocoder attempts to geocode addresses to the most precise postal code it finds. The advantage of postal code centroid matching is the speed of the operation. The disadvantage of postal code matching is that the geocoder only examines the PostalCode field. If you use street address precision, the geocoder looks at both the street name and the PostalCode field and attempts to return street-level coordinates and optionally fall back to postal code coordinates.</p> <p>GeographicCentroid The geocoder attempts to geocode addresses to the geographic centroid of a city or state.</p>

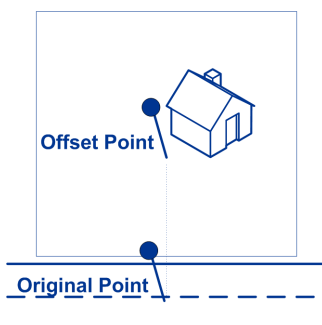
Parameter	Description
Option.Interpolation	<p>Specifies whether to perform address point interpolation. This option only works if you have a point database installed. This option is not available for all countries.</p> <p>Address point interpolation uses point data to refine geocode results. By default, the geocoding process estimates the location of an address based on the street numbers at either end of street segment. For example, if a street segment runs from 100 Main St. to 200 Main St., then a request for 150 Main St. will return a location in the middle of the segment. With interpolation, the geocoder finds the position of 180 Main St. in the point data, and it is about two-thirds of the way down the street. Using this information, the geocoder can estimate the position of 150 Main St. based on 100 and 180 Main St. In this case, the geocoder estimates the location of the address slightly away from the center of the segment.</p> <p>Y Yes, perform address point interpolation.</p> <p>N No, do not perform address point interpolation.</p>
Option.FallbackToGeographic	<p>Specifies whether to attempt to determine a geographic region centroid when an address-level geocode cannot be determined.</p> <p>Y Yes, determine a geographic centroid when an address-level centroid cannot be determined. Default.</p> <p>N No, do not determine a geographic centroid when an address-level centroid cannot be determined.</p>
Option.FallbackToPostal	<p>Specifies whether to attempt to determine a postal code centroid when an address-level geocode cannot be determined.</p> <p>Y Yes, determine a postal code centroid when an address-level centroid cannot be determined. Default.</p> <p>N No, do not determine a postal code centroid when an address-level centroid cannot be determined.</p>

Parameter Description

Option.OffsetFromStreet Indicates the offset distance from the street segments to use in street-level geocoding. The distance is specified in the units you specify in the Option.OffsetUnits parameter.

The default is 10 meters.

The offset distance is used in street-level geocoding to prevent the geocode from being in the middle of a street. It compensates for the fact that street-level geocoding returns a latitude and longitude point in the center of the street where the address is located. Since the building represented by an address is not on the street itself, you do not want the geocode for an address to be a point on the street. Instead, you want the geocode to represent the location of the building which sits next to the street. For example, an offset of 50 feet means that the geocode will represent a point 50 feet back from the center of the street. The distance is calculated perpendicular to the portion of the street segment for the address. Offset is also used to prevent addresses across the street from each other from being given the same point. The following diagram shows an offset point in relation to the original point.

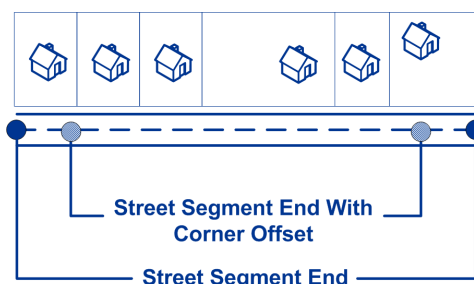


Street coordinates are accurate to 1/10,000 of a degree and interpolated points are accurate to the millionths of a degree.

Option.OffsetFromCorner Specifies the distance to offset the street end points in street-level matching. The distance is specified in the units you specify in the Option.OffsetUnits parameter.

The default is 12 meters.

The following diagram compares the end points of a street to offset end points.



Parameter	Description
Option.OffsetUnits	<p>Specifies the unit of measurement for the street offset and corner offset options. One of the following:</p> <ul style="list-style-type: none"> • Feet • Miles • Meters • Kilometers <p>The default is Meters.</p>
Option.ReturnStreetAbbreviation	<p>Controls whether candidates return standard street type abbreviations or fully spelled out street types. Select Return Street Type Abbreviation if you prefer candidates to return the abbreviated street type (for example, ST instead of STREET). By default, the full street type is returned.</p> <p>Y Yes, return abbreviated street types.</p> <p>N No, return fully spelled out street types.</p>
Option.GNAFPointType	<p>For street address matching, specifies whether to return the parcel latitude/longitude or the street frontage latitude/longitude. This option is available only if you have the G-NAF database installed, and the database selected in the Database list on the Data tab includes the G-NAF database. This option only affects addresses matched to the G-NAF database.</p> <p>One of the following:</p> <p>P In a street address match, return the exact location of the parcel. This is the standard G-NAF point which is the exact authoritative point returned by the G-NAF database. Default.</p> <p>S In a street address match, return the street frontage point for the parcel. The street frontage point is 12.5 meters from the front boundary of the parcel. Street frontage points are more suitable for routing applications.</p>
Option.Return8DecimalPlaceParcelLatLong	<p>Specifies whether to return the original latitude and longitude, precise up to eight digits after the decimal. This is the latitude/longitude that the candidate matched to in the G-NAF database. These are the original coordinates directly from the G-NAF data prior to truncation or rounding. This option is available only if you have the G-NAF database installed, and the database selected in the Database list on the Data tab includes the G-NAF database. This option only affects addresses matched to the G-NAF database.</p> <p>Y Yes, return the original latitude/longitude, up to eight digits after the decimal.</p> <p>N No, do not return the original latitude/longitude.</p>

Parameter	Description
Option.CoordinateSystem	<p>A coordinate system is a reference system for the unique location of a point in space. Cartesian (planar) and Geodetic (geographical) coordinates are examples of reference systems based on Euclidean geometry. Spectrum™ Technology Platform supports systems recognized by the European Petroleum Survey Group (EPSG).</p> <p>EPSG:4283 Also known as the GDA94 coordinate system.</p> <p>EPSG:4326 Also known as the WGS84 coordinate system.</p> <p>EPSG:27200 Also known as the NZGD49 coordinate system.</p>

Matching Options

Matching options let you set match restrictions, fallback, and multiple match settings so that the matching can be as strict or relaxed as you need. The strictest matching conditions require an exact match on house number, street name, postal code and no fallback to postal code centroids. The geocoder looks for an exact street address match within the postal code in the input address. Relaxing the conditions broadens the area in which it searches for a match. For example, by relaxing the postal code, the geocoder searches for candidates outside the postal code but within the city of your input address.

For guidelines on how to balance match rate and precision, see [Balancing Match Rate and Precision](#) on page 13.

Table 4: Matching Options for Australia

Parameter	Description
Option.KeepMultimatch	<p>Specifies whether to return results when the address matches to multiple candidates in the database. If this option is not selected, an address that results in multiple candidates will fail to geocode.</p> <p>If you select this option, specify the maximum number of candidates to return.</p> <p>Y Yes, return candidates when multiple candidates are found. Default.</p> <p>N No, do not return candidates. Addresses that result in multiple candidates will fail to geocode.</p>
Option.MaxCandidates	<p>If you specify KeepMultimatch=Y, this option specifies the maximum number of results to return. The default is 1.</p>

Parameter	Description
Option.CloseMatchesOnly	<p>Specifies whether to return only those geocoded results that are close match candidates. For example, if there are 10 candidates and two of them are close candidates, and you enable this option, only the two close matching candidates would be returned instead of all 10. To specify what is considered a close match, use the MustMatch options. Address candidates are ranked according to how closely the input address matches these preferences.</p> <p>Y Yes, return only close matches.</p> <p>N No, do not return only close matches. Default.</p>
Option.MatchMode	<p>Specifies how to determine whether a candidate is a close match. One of the following:</p> <p>CustomMode This option allows you to specify which parts of a candidate address must match the input address to be considered a close match. Use the MustMatch<Element> options to specify the address elements you want. This is the default value.</p> <p>RelaxedMode All candidates are considered close.</p>
Option.MustMatchInput	<p>Specifies whether candidates must match all non-blank input fields to be considered a close match. For example, if an input address contains a city and postal code, then candidates for this address must match the city and postal code to be considered a close match.</p> <p>Y Yes, a candidate must match all input to be considered a close match.</p> <p>N No, a candidate does not have to match all input to be considered a close match. Default.</p>
Option.MustMatchHouseNumber	<p>Specifies whether candidates must match the house number to be considered a close match.</p> <p>If you select this option you should also require an exact match on street name. This option does not significantly affect performance. It does, however, affect the type of match if the candidate address corresponds to a segment that does not contain any ranges. The type of match can also be affected when the house number range for a candidate does not contain the input house number.</p> <p>Y Yes, a candidate must match the house number to be considered a close match.</p> <p>N No, a candidate does not have to match the house number to be considered a close match.</p>

Parameter	Description
Option.MustMatchStreet	<p>Specifies whether candidates must match the street name to be considered a close match.</p> <p>If a close match is found, the geocoder attempts expanded street name manipulation, which looks for candidates with names that sound like the input address or that are spelled improperly. This slows down performance but increases the match rate . If the geocoding database is indexed, the performance impact is reduced.</p> <p>Y Yes, a candidate must match the street name to be considered a close match.</p> <p>N No, a candidate does not have to match the street name to be considered a close match.</p>
Option.MustMatchLocality	This option is not used for this country.
Option.MustMatchCity	<p>Specifies whether candidates must match the city to be considered a close match. If you do not require exact matches on city, the geocoder searches on the street address matched to the particular postal code, and considers other cities that do not match the name, but do match the postal code.</p> <p>Y Yes, a candidate must match the city to be considered a close match.</p> <p>N No, a candidate does not have to match the city to be considered a close match.</p>
Option.MustMatchCounty	<p>Specifies whether candidates must match the Local Government Authority (LGA) to be considered a close match.</p> <p>Y Yes, a candidate must match the county to be considered a close match.</p> <p>N No, a candidate does not have to match the county to be considered a close match.</p>
Option.MustMatchStateProvince	<p>Specifies whether candidates must match the state to be considered a close match.</p> <p>Y Yes, a candidate must match the state or province to be considered a close match.</p> <p>N No, a candidate does not have to match the state or province to be considered a close match.</p>

Parameter	Description
Option.MustMatchPostalCode	<p>Specifies whether candidates must match the postal code to be considered a close match. If you do not require exact match on postal codes, the geocoder searches a wider area for a match. While this results in slower performance, the match rate is higher because the request does not need to match exactly when it compares match candidates.</p> <p>Y Yes, a candidate must match the postal code to be considered a close match.</p> <p>N No, a candidate does not have to match the postal code to be considered a close match.</p>
Option.PreferPostalCodeOverCity	<p>Specifies whether to return a close match when the postal code and street match exactly but the city does not. If you enable this option, the City input field is ignored if the postal code and street address are an exact match. If you do not enable this option, there may be situations where street address and postal code input are an exact match but the city name is not, and close matches are not returned.</p> <p>For example, without this option enabled, the following input address would return no close matches:</p> <pre>5 East St GLENROY VIC 3046</pre> <p>With this option enabled, this same input address would return the following close match:</p> <pre>5 EAST ST HADFIELD VIC 3046</pre> <p>One of the following:</p> <p>Y Yes, return close matches if the postal code and street address are an exact match and ignore the city input.</p> <p>N No, do not return close matches if the postal code and street address are an exact match and the city is not. Default.</p>

Data Options

The Data tab allows you to specify which databases to use in geocoding. Databases contain the address and geocode data necessary to determine the geocode for a given address. There are two kinds of databases: standard databases and custom databases. Standard databases are those supplied by Pitney Bowes and based on address and geocoding data from postal authorities and suppliers of geographical data. Custom databases are databases you create to enhance or augment standard databases for your particular needs.

For Australian geocoding, to achieve the best geocoding spatial precision use the G-NAF database. This provides point-level geocoding that places points within the land parcel boundary for a given address. The G-NAF database requires an additional license. Contact your sales representative for more information.

The following table lists the options available for specifying which databases to use and the search order of databases.

Table 5: Data Options for Australia

Parameter	Description
Option.Database	Specifies the database to be used for geocoding. Only databases that have been defined in the Databases Resources panel in the Management Console are available.
Option.DatabasePreference	<p>Specifies which geocoding databases to use. One of the following:</p> <ul style="list-style-type: none"> PreferCustom Use both standard databases and custom databases, but give preference to candidates from custom databases. Use this option if you feel your custom database is superior to the standard database. PreferStandard Use both standard databases and custom databases, but give preference to candidates from standard databases. CustomOnly Use only custom databases. Ignore standard databases. StandardOnly Use only standard databases. Ignore custom databases. Both Use both standard databases and custom databases. In cases where candidates are returned from both, the standard database is preferred. Default. <p>The results from a custom database have a "U" at the end of the result code. Results from an address database have an "A" at the end of the match score. For example: S5HPNTSCZA is a match score that comes from an address database, while S5HPNTSCZU comes from a custom database. For more information, see Result Codes for International Geocoding on page 40.</p>

Parameter	Description
Option.DatabaseSearchOrder	<p>The name of one or more database resources to use in the search process. Use the database name specified in the Management Console's Database Resources tool. For more information, see the <i>Spectrum™ Technology Platform Administration Guide</i>.</p> <p>You can specify multiple database resources. If you specify more than one database, list them in order of preference.</p> <p>The order of the databases has an effect when there are close match candidates from different databases. The close matches that are returned come from the database that is first in the search list. Close matches from lower ranked databases are demoted to non-close matches.</p> <p>You can also use the order of the databases to perform fallback processing if you have an both an address point database and a street-level database installed for the country. List the address point database first and the street database second. If the address cannot be geocoded to the address point level, the geocoder will attempt to geocode it to the street level.</p>

Output

GeocodeAddressAUS returns the latitude/longitude, standardized address, and result indicators. Result indicators describe how well the geocoder matched the input address to a known address and assigned a location; they also describe the overall status of a match attempt.

Address Output

The address may be identical to the input address if the input address was accurate, or it may be a standardized version of the input address, or it may be a candidate address when multiple matches are found.

Table 6: Address Output for Australia

Response Element	Description
AddressLine1	First line of the address.

Response Element	Description
AddressLine2	Second line of the address.
ApartmentLabel	The type of unit, such as apartment, suite, or lot.
ApartmentNumber	Unit number.
City	The municipality name.
Country	The three-letter ISO 3166-1 Alpha 3 country code. For Australia, the country code is AUS.
Data.County	The Local Government Authority (LGA) name.
FirmName	Name of the company or a place name.
HouseNumber	The building number for the matched location.
HouseNumberHigh	The highest house number of the range in which the address resides.
HouseNumberLow	The lowest house number of the range in which the address resides.
HouseNumberParity	Indicates if the house number range contains even or odd numbers or both. E Even O Odd B Both U Unknown
LastLine	Complete last address line (city, state/province, and postal code).

Response Element	Description
LeadingDirectional	Street directional that precedes the street name. For example, the N in 138 N Main Street.
NumberOfCandidateRanges	Indicates whether the address has a house number. One of the following: <ul style="list-style-type: none"> 0 The address has no house number. Examples of addresses that have no house number are P.O. box addresses and general delivery addresses. 1 The address has a house number. For information about the range in which the house number falls, see the HouseNumberHigh, HouseNumberLow, and HouseNumberParity fields. 2 WHAT IS VALUE OF 2?
NumberOfRangeUnits	Indicates whether or not the address has a unit number, such as a suite number or apartment number. One of the following: <ul style="list-style-type: none"> 0 The address has no unit number. 1 The address has a unit number. For information about the range in which the unit number falls, see the UnitNumberHigh and UnitNumberLow.
PostalCode	The postal code for the address. The format of the postcode varies by country.
PostalCode.Addon	The second part of the postcode. This field is not used by most countries.
PreAddress	Miscellaneous information that appears before the street name.
PrivateMailbox	This field is not currently used.
SegmentCode	A unique ID that identifies a street segment.
SegmentParity	Indicates which side of the street has odd numbers. <ul style="list-style-type: none"> L Left side of the street R Right side of the street B Both sides of the street U Undetermined

Response Element	Description
Data.StateProvince	The state name.
StreetDataType	<p>The default search order rank of the database used to geocode the address. A value of "1" indicates that the database is first in the default search order, "2" indicates that the database is second in the default search order, and so on.</p> <p>The default database search order is specified in the Management Console with the Database Resources tool.</p>
StreetName	The street name.
StreetPrefix	<p>The type of street when the street type appears before the base street name. For example, AVENUE:</p> <p>12 AVENUE B KALGOORLIE WA 6430</p>
StreetSuffix	The street type of the matched location. For example, AVE for Avenue.
TrailingDirectional	Street directional that follows the street name. For example, the N in 456 Washington N.
UnitNumberHigh	The highest unit number of the range in which the unit resides.
UnitNumberLow	The lowest unit number of the range in which the unit resides.

Geocode Output

Table 7: Geocode Output for Australia

Response Element	Description
CoordinateSystem	The coordinate system used to determine the latitude and longitude coordinates. A coordinate system specifies a map projection, coordinate units and more. An example is EPSG:4326. EPSG stands for European Petroleum Survey Group.
Latitude	Seven-digit number in degrees and calculated to four decimal places (in the format specified).
Longitude	Seven-digit number in degrees and calculated to four decimal places (in the format specified).

Result Codes

Result codes contain information about the success or failure of the geocoding attempt, as well as information about the accuracy of the geocode.

Table 8: Result Code Output for Australia

Response Element	Description				
Geocoder.MatchCode	Indicates how closely the input address matches the candidate address. For more information, see Result Codes for International Geocoding on page 40.				
IsCloseMatch	Indicates whether or not the address is considered a close match. An address is considered close based on the "Close match criteria" options on the Matching tab. <table border="0" style="margin-left: 20px;"> <tr> <td>Y</td> <td>Yes, the address is a close match.</td> </tr> <tr> <td>N</td> <td>No, the address is not a close match.</td> </tr> </table>	Y	Yes, the address is a close match.	N	No, the address is not a close match.
Y	Yes, the address is a close match.				
N	No, the address is not a close match.				

Response Element	Description										
MultiMatchCount	<p>For street address geocoding, the number of matching address positions found for the specified address.</p> <p>For intersection geocoding, the number of matching street intersection positions found for the specified addresses.</p>										
Status	<p>Reports the success or failure of the match attempt</p> <table> <tr> <td>null</td> <td>Success</td> </tr> <tr> <td>F</td> <td>Failure</td> </tr> </table>	null	Success	F	Failure						
null	Success										
F	Failure										
Status.Code	<p>If the geocoder could not process the address, this field will show the reason.</p> <ul style="list-style-type: none"> • Internal System Error • No Geocode Found • Insufficient Input Data • Multiple Matches Found • Exception occurred • Unable to initialize Geocoder • No Match Found 										
Status.Description	<p>If the geocoder could not process the address, this field will show a description of the failure.</p> <table> <tr> <td>Problem + explanation</td> <td>Returned when Status.Code = Internal System Error.</td> </tr> <tr> <td>Geocoding Failed</td> <td>Returned when Status.code = No Geocode Found.</td> </tr> <tr> <td>No location returned</td> <td>Returned when Status.code = No Geocode Found.</td> </tr> <tr> <td>No Candidates Returned</td> <td>The geocoder could not identify any candidate matches for the address.</td> </tr> <tr> <td>Multiple Candidates Returned and Keep Multiple Matches not selected</td> <td>The address resulted in multiple candidates. In order for the candidate address to be returned, you must.</td> </tr> </table>	Problem + explanation	Returned when Status.Code = Internal System Error.	Geocoding Failed	Returned when Status.code = No Geocode Found.	No location returned	Returned when Status.code = No Geocode Found.	No Candidates Returned	The geocoder could not identify any candidate matches for the address.	Multiple Candidates Returned and Keep Multiple Matches not selected	The address resulted in multiple candidates. In order for the candidate address to be returned, you must.
Problem + explanation	Returned when Status.Code = Internal System Error.										
Geocoding Failed	Returned when Status.code = No Geocode Found.										
No location returned	Returned when Status.code = No Geocode Found.										
No Candidates Returned	The geocoder could not identify any candidate matches for the address.										
Multiple Candidates Returned and Keep Multiple Matches not selected	The address resulted in multiple candidates. In order for the candidate address to be returned, you must.										

Response Element	Description
LocationPrecision	A code describing the precision of the geocode. One of the following: <ul style="list-style-type: none"> 0 No coordinate information is available for this candidate address. 1 Interpolated street address. 2 Street segment midpoint. 3 Postal code 1 centroid. 4 Partial postal code 2 centroid. 5 Postal code 2 centroid. 6 Intersection. 7 Point of interest. 8 State/province centroid. 9 County centroid. 10 City centroid. 11 Locality centroid. 12 Additional point precision for unspecified custom item. 13 Additional point precision for unspecified custom item. 14 Additional point precision for unspecified custom item. 15 Additional point precision for unspecified custom item. 16 The result is an Address Point. 17 The result was generated by using address point data to modify the candidates segment data.

Result Codes for International Geocoding

Candidates returned by Spectrum geocoders return another class of return codes that are referred to as International Geocoding Result Codes. Each attempted match returns a result code in the Geocoder.MatchCode output field.

International Street Geocoding Result Codes (S Codes)

Street level geocoded candidates return a result code beginning with the letter S. The second character in the code indicates the positional accuracy of the resulting point for the geocoded record.

Table 9: Street (S) Result Codes

S Result Code	Description
S1	Single close match with the point located at postal code centroid.
S3	Single close match with the point located at postal code centroid.
S4	Single close match with the point located at the street centroid. For databases vintage 2014 Q4 or newer, the input house number is returned with the candidate even if no such house number was found. The S4 code is followed by letters and dashes indicating match precision. See Interpreting S Result Codes on page 42
S5	Single close match with the point located at a street address position. The S5 code is followed by letters and dashes indicating match precision. For information about these letters, see Interpreting S Result Codes on page 42.
S7	Single match with the point located at an interpolated point along the candidate's street segment. When the potential candidate is not an address point candidate and there are no exact house number matches among other address point candidates, the S7 result is returned using address point interpolation. The point is interpolated according to the next highest or lowest address point candidate that both intersects the segment and whose house number is contained within the range of houses of the original candidate. By using known address reference points on the street segment, the S7 point can be adjusted to a more accurate position. For Australia, the S7-----G result code is also used for single matches with G-NAF Reliability level of 3. The reliability level is returned in the output field AUS.GNAF_Reliability. For more information, see Australia G-NAF Database Output
S8	Single close match with the point located at either the single point associated with an address point candidate or at an address point candidate that shares the same house number. No interpolation is required. S8 returns are possible with point databases only. For Australia, the S8-----G result code is also used for single matches with G-NAF Reliability levels of 1 or 2 (the highest level of G-NAF Reliability). The reliability level is returned in the output field AUS.GNAF_Reliability.
SG	For Australia, single close match with the point at the center of a locality, or Locality level geocode derived from topographic feature. An SG-----G result code is associated with G-NAF Reliability Level 5 (locality or neighborhood) or with Level 6 (unique region). The reliability level is returned in the output field AUS.GNAF_Reliability. For more information, see Australia G-NAF Database Output .
SP	For Australia, single close match to a postal (PO Box) location. This can be generated from the Street Range Address database only (not the G-NAF database).
SX	Single close match with the point located at street intersection.

Interpreting S Result Codes

For S (street geocoded) international result codes, eight additional characters describe how closely the address matches an address in the database. The characters appear in the order listed in the following table. Any non-matched address elements are represented by a dash.

For example, the result code S5--N-SCZA represents a single close match that matched the street name, street suffix direction, town, and postcode. The dashes indicate that there was no match on house number, street prefix direction, or thoroughfare type. The match came from the Street Range Address database. This record would be geocoded at the street address position of the match candidate.

Category	Description	Example
H	House number	18
P	Street prefix direction P is present if any of these conditions are satisfied: <ul style="list-style-type: none"> • The candidate pre-directional matches the input pre-directional. • The candidate post-directional matches the input pre-directional after pre- and post-directionals are swapped. • The input does not have a pre-directional. 	North
N	Street name	Merivale
T	Street type	St
S	Street suffix direction S in result code is present if any of these conditions are satisfied: <ul style="list-style-type: none"> • The candidate post-directional matches the input post-directional. • The candidate pre-directional matches the input post-directional after pre- and post-directionals are swapped. • The input does not have a post-directional. 	W

Category	Description	Example
C	City name	South Brisbane
Z	Postal code	4101
A, G, or U	Database type used to obtain the match. <ul style="list-style-type: none"> A—Street Range Address database. G—G-NAF Point Address Dictionary (Australia only). U—Customer (user-defined) database. 	A

International Postal Geocoding Result Codes (Z Codes)

Matches in the Z category indicate that a match was made at the postcode level. A postcode match is returned in either of these cases:

- You specified to match to postal code centroids. The resulting point is located at the postal code centroid with the following possible accuracy levels.
- There is no street level close match and you specified to fall back to postal code centroid.

Table 10: Postal (Z) Result Codes

Z Result Code	Description
Z1	Postal Code centroid match.
Z3	Full postal code centroid match. For Canada, this is an FSALDU centroid.

Postal level geocoded candidates return a result code beginning with the letter Z. Australia can generate a Z1 result code. Country-specific geocoders can often generate more accurate postcode results (with Z2 or Z3 result codes).

If the postal candidate comes from a user dictionary, the letter U is appended to the result. For example, Z1U indicates a postal centroid match from a custom user dictionary.

International Geographic Geocoding Result Codes (G Codes)

Geographic level geocoded candidates return a result code beginning with the letter G. The numbers following the G in the result code provides more detailed information about the accuracy of the candidate.

Table 11: Geographic (G) Result Codes

G Result Code	Description
G1	State or province centroid. match.
G2	County (district or region) centroid match.
G3	City or town (municipality) centroid match. For Australia, Local Government Authority (LGA) information can be returned from the Street Range Address Database only (not the G-NAF database).
G4	Locality (village, suburb, or neighborhood) centroid match.

If the geographic candidate comes from a user dictionary, the letter U is appended to the result code. For example, G4U indicates a locality centroid match from a custom user dictionary.

Reverse Geocoding Codes (R Codes)

Matches in the R category indicate that the record was matched by reverse geocoding. The second two characters of the R result code indicate the type of match found. R geocode results include an additional letter to indicate the dictionary from which the match was made.

Example reverse geocoding codes:

Table 12: Reverse Geocoding (R) Result Codes

Reverse Geocoding Code	Description
RS8A	Point/parcel level precision for reverse geocoding. Candidate returned from address dictionary.
RS8G	Point/parcel level precision. Candidate returned from Australia G-NAF database with G-NAF Reliability level of 1 or 2.
RS7G	Candidate returned from Australia G-NAF database with G-NAF Reliability level of 3.
RS5A	Interpolated street candidate for reverse geocoding. Candidate returned from address dictionary.

Reverse Geocoding Code	Description
RS4A	Street centroid candidate for reverse geocoding. Candidate returned from address dictionary.
RS4G	Candidate returned from Australia G-NAF database with a G-NAF Reliability level of 4 (associated with a unique road feature)
RSGG	Candidate returned from Australia G-NAF database with G-NAF Reliability Level 5 (locality or neighbourhood) or with Level 6 (unique region.)

If the reverse geocoded candidate comes from a user dictionary, the letter U is appended to the result. For example, RS8U indicates a point/parcel level reverse geocode match from a custom user dictionary.

Non-match Codes

The following result codes indicate no match was made:

- **N**—No close match.
- **NX**—No close match for street intersections.
- **ND**—Spectrum™ Technology Platform could not find the geocoding database for the given postal code or municipality/state/province.

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ReverseGeocodeAddressGlobal

ReverseGeocodeAddressGlobal determines the address for a given latitude/longitude point. ReverseGeocodeAddressGlobal can determine addresses in many countries. The countries available to you depends on which country databases you have installed. For example, if you have databases for Canada, Italy, and Australia installed, ReverseGeocodeAddressGlobal would be able to geocode addresses in these countries in a single stage.

Note: ReverseGeocodeAddressGlobal does not support U.S. addresses. To geocode U.S. addresses, you must use ReverseGeocodeUSLocation. That performs reverse geocoding specifically for USA addresses.

Before you can work with ReverseGeocodeAddressGlobal, you must define a global database resource containing a database for one or more countries. Once you create the database resource, ReverseGeocodeAddressGlobal will be available.

In this section

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Input

ReverseGeocodeAddressGlobal takes longitude and latitude as input.

For GRC, RUS, and JPN, the user's locale determines the language of the returned candidates for reverse geocoding. This can be Greek, Russian, or Japanese for GRC, RUS, and JPN respectively. English is the default locale.

Table 13: ReverseGeocodeGlobal Input

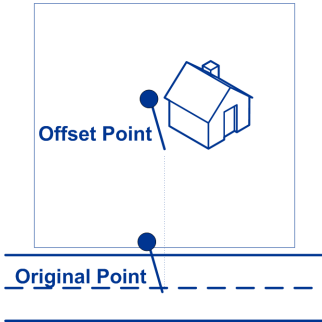
Parameter	Format	Description
Data.Latitude	String	The latitude of the point for which you want address information.
Data.Longitude	String	The longitude of the point for which you want address information.
Data.Country	String	One of the following: <ul style="list-style-type: none">• The name of the country in English.• The two-character ISO 3116-1 alpha-2 country code.• The three-character ISO 3116-1 alpha-3 country code.

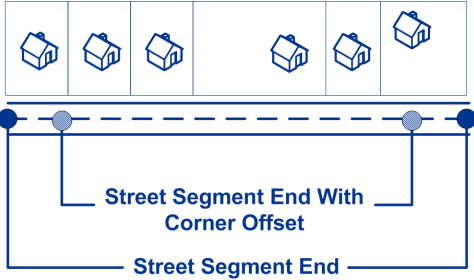
Options

Geocoding Options

Table 14: Geocoding Options for Australia

Parameter	Description
Option.SearchDistance	The radius from the input coordinates in which to search for an address. Street segments and points within the radius are considered. The default search radius is 150 meters and the maximum search radius is 1600 meters.
Option.Units	The units in which the search distance is specified. One of the following: <ul style="list-style-type: none">• Feet• Miles• Meters• Kilometers

Parameter	Description
Option.OffsetFromStreet	<p data-bbox="535 373 1437 436">Indicates the offset distance from the street segments to use in street-level geocoding. The distance is specified in the units you specify in the OffsetUnits option.</p> <p data-bbox="535 447 1437 510">The default value varies by country. For most countries, the default is 7 meters. For Austria, Germany, and Australia the default is 10 meters.</p> <p data-bbox="535 531 1437 888">The offset distance is used in street-level geocoding to prevent the geocode from being in the middle of a street. It compensates for the fact that street-level geocoding returns a latitude and longitude point in the center of the street where the address is located. Since the building represented by an address is not on the street itself, you do not want the geocode for an address to be a point on the street. Instead, you want the geocode to represent the location of the building which sits next to the street. For example, an offset of 50 feet means that the geocode will represent a point 50 feet back from the center of the street. The distance is calculated perpendicular to the portion of the street segment for the address. Offset is also used to prevent addresses across the street from each other from being given the same point. The following diagram shows an offset point in relation to the original point.</p>  <p data-bbox="535 1255 1437 1312">Street coordinates are accurate to 1/10,000 of a degree and interpolated points are accurate to the millionths of a degree.</p>

Parameter	Description						
Option.OffsetFromCorner	<p>Specifies the distance to offset the street end points in street-level matching. The distance is specified in the units you specify in the OffsetUnits option. This value is used to prevent addresses at street corners from being given the same geocode as the intersection.</p> <p>Note: Offset is not supported for the United Kingdom (GBR) or Japan (JPN).</p> <p>The default value varies by country:</p> <ul style="list-style-type: none"> • 12 meters—Australia (AUS), Austria (AUT), Germany (DEU) • 7 meters—For other supported countries, the default offset is 7 meters. <p>The following diagram compares the end points of a street to offset end points.</p> 						
Option.OffsetUnits	<p>Specifies the unit of measurement for the street offset and corner offset options. One of the following:</p> <ul style="list-style-type: none"> • Feet • Miles • Meters • Kilometers <p>The default is Meters.</p>						
Option.CoordinateSystem	<p>A coordinate system is a reference system for the unique location of a point in space. Cartesian (planar) and Geodetic (geographical) coordinates are examples of reference systems based on Euclidean geometry. Spectrum™ Technology Platform supports systems recognized by the European Petroleum Survey Group (EPSG).</p> <p>Each country supports different coordinate systems. Depending on the country, you have one or more of the following options:</p> <table border="0"> <tr> <td>EPSG:4283</td> <td>Also known as the GDA94 coordinate system.</td> </tr> <tr> <td>EPSG:4326</td> <td>Also known as the WGS84 coordinate system.</td> </tr> <tr> <td>EPSG:27200</td> <td>Also known as the NZGD49 coordinate system.</td> </tr> </table>	EPSG:4283	Also known as the GDA94 coordinate system.	EPSG:4326	Also known as the WGS84 coordinate system.	EPSG:27200	Also known as the NZGD49 coordinate system.
EPSG:4283	Also known as the GDA94 coordinate system.						
EPSG:4326	Also known as the WGS84 coordinate system.						
EPSG:27200	Also known as the NZGD49 coordinate system.						

Matching Options

Table 15: Matching Options for Australia

Parameter	Description
Option.KeepMultimatch	<p>Specifies whether to return results when the coordinates match to multiple candidate addresses in the database. If this option is not selected, coordinates that results in multiple address candidates will fail to geocode.</p> <p>If you select this option, specify the maximum number of candidates to return using the Option.MaxCandidates option (see below).</p> <p>Y Yes, return candidates when multiple candidates are found. Default.</p> <p>N No, do not return candidates. Addresses that result in multiple candidates will fail to geocode.</p>
Option.SortCandidatesUsingLocale	<p>This is a Reverse geocoding option that applies to Greece, Russia, Ukraine, and any other country that supports dual character sets (such as the Middle East countries).</p> <p>Specifies whether candidates are sorted and returned based on the input language. That is, if the input was in Russian, the Russian character candidate is returned first followed by the English language candidate. This will override the dictionary order.</p> <p>Y Yes, candidates are sorted and returned based on input language.</p> <p>N No, candidates are returned in the order that the dictionary was added to the database, regardless of input language.</p>

Data Options

The Data tab allows you to specify which databases to use in reverse geocoding. Databases contain the address and geocode data necessary to determine the address for a given point. The following table lists the options available for specifying the search order of databases.

Table 16: Data Options for Australia

Parameter	Description
Option.DatabaseSearchOrder	<p>The name of one or more database resources to use in the search process. Use the database name specified in the Management Console.</p> <p>You can specify multiple database resources. If you specify more than one database, list them in order of preference.</p> <p>The order of the databases has an effect when there are close match candidates from different databases. The close matches that are returned come from the database that is first in the search list. Close matches from lower ranked databases are demoted to non-close matches.</p> <p>You can also use the order of the databases to perform fallback processing if you have an both an address point database and a street-level database installed for the country. List the address point database first and the street database second. If the address cannot be geocoded to the address point level, the geocoder will attempt to geocode it to the street level.</p>

Output

Table 17: Reverse Geocode Address Global Output Fields

Response Element	Description
AddressLine1	First line of the address.
AddressLine2	Second line of the address.
ApartmentLabel	The type of unit, such as apartment, suite, or lot.
ApartmentNumber	Unit number.
City	The municipality name.

Response Element	Description								
Data.County	<p>The meaning of county varies by country.</p> <p>The Local Government Authority (LGA) name.</p> <ul style="list-style-type: none"> • AUS (Australia)—The Local Government Authority (LGA) • VNM (Vietnam)—District 								
Distance	<p>The distance from input location in meters. If the input coordinates are an exact match for the address, the value is 0.</p>								
FirmName	<p>Name of the company or a place name.</p>								
Geocoder.MatchCode	<p>Indicates how closely the input coordinates match the candidate address. For more information, see Reverse Geocoding Codes (R Codes) on page 44.</p>								
HouseNumber	<p>The building number for the matched location.</p>								
HouseNumberHigh	<p>The highest house number of the range in which the address resides.</p>								
HouseNumberLow	<p>The lowest house number of the range in which the address resides.</p>								
HouseNumberParity	<p>Indicates if the house number range contains even or odd numbers or both.</p> <table> <tbody> <tr> <td>E</td> <td>Even</td> </tr> <tr> <td>O</td> <td>Odd</td> </tr> <tr> <td>B</td> <td>Both</td> </tr> <tr> <td>U</td> <td>Unknown</td> </tr> </tbody> </table>	E	Even	O	Odd	B	Both	U	Unknown
E	Even								
O	Odd								
B	Both								
U	Unknown								
Language	<p>For reverse geocoded candidates, the two-character language code is returned.</p>								

Response Element	Description
LastLine	Complete last address line (city, state/province, and postal code).
LeadingDirectional	Street directional that precedes the street name. For example, the N in 138 N Main Street.
Data.Locality	<p>The meaning of locality varies by country. Generally a locality is a village in rural areas or it may be a suburb in urban areas. When used, a locality typically appears on the last line of the address with the postcode.</p> <ul style="list-style-type: none"> • AUS (Australia)—Not used • VNM (Vietnam)—Not used.
NumberOfCandidateRanges	Indicates the number of ranges of which the candidate is a member. A candidate may be a part of multiple ranges if the candidate is a street instead of a building. To specify the number of ranges to return for each candidate, use the <code>MaxRanges</code> option.
NumberOfRangeUnits	Indicates the number of units included in the range. A unit is an address within a building, such as an apartment or office suite.
PostalCode	The postal code for the address. The format of the postcode varies by country. Postcode data is not available for every country.
PostalCode.Addon	The second part of a postcode. This field is not used by most countries.
PreAddress	Miscellaneous information that appears before the street name.
PrivateMailbox	This field is not currently used.

Response Element	Description
SegmentCode	A unique ID that identifies a street segment.
SegmentParity	<p>Indicates which side of the street has odd numbers.</p> <p>L Left side of the street</p> <p>R Right side of the street</p> <p>B Both sides of the street</p> <p>U Undetermined</p>
Data.StateProvince	<p>The meaning of State/Province varies by country.</p> <ul style="list-style-type: none"> • AUS (Australia)—State
StreetDataType	<p>The default search order rank of the database used to geocode the address. A value of "1" indicates that the database is first in the default search order, "2" indicates that the database is second in the default search order, and so on.</p> <p>The default database search order is specified in the Management Console.</p>
StreetName	For most countries, this contains the street name.
StreetPrefix	The type of street when the street type appears before the base street name.
StreetSuffix	The type of street when the street type appears after the base street name.
TrailingDirectional	Street directional that follows the street name.
UnitNumberHigh	The highest unit number of the range in which the unit resides.

Response Element	Description
UnitNumberLow	The lowest unit number of the range in which the unit resides.

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GNAFPIDLocationSearch

GNAFPIDLocationSearch identifies the address and latitude/longitude coordinates for a Geocoded National Address File Persistent Identifier (G-NAF PID). The G-NAF PID is a 14-character alphanumeric string that uniquely identifies each G-NAF address in the G-NAF database (a database of Australian locations). The PID is constructed from a combination of the major address fields of the G-NAF database. An example of a G-NAF PID is:

GAVIC411711441

Note: You must have the G-NAF database installed to use GNAFPIDLocationSearch.

GNAFPIDLocationSearch is part of the Geocoding Address AUS component. GNAF PID Location Search is the only stage used from Geocode Address AUS. That component is otherwise deprecated. Use the Geocode Address Global component for all other Australia geocoding capabilities.

For more information about the Enterprise Geocoding Module, see [Enterprise Geocoding Module](#) on page 4.

In this section

G-NAF PID Input	58
G-NAF PID Location Search Options	58
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G-NAF PID Input

GNAFPIDLocationSearch takes a G-NAF PID as input, and returns the address and latitude/longitude coordinates for a Geocoded National Address File Persistent Identifier (G-NAF PID).

Note: GNAF PID Location Search functionality is not supported by the Geocode Address Global component. You must use the Geocode Address AUS component for this functionality. GNAF PID Location Search is the only stage used from Geocode Address AUS. That component is otherwise deprecated.

Table 18: GNAFPIDLocationSearch Input

Parameter	Format	Description
Data.GNAFPID	String	The 14-character G-NAF persistent identifier you want to look up. For example: GAVIC411711441

G-NAF PID Location Search Options

GNAFPIDLocationSearch includes an option to select the G-NAF database for the PID search.

G-NAF Geocoding Options

Table 19: GNAFPIDLocationSearch Geocoding Options

Parameter	Description
Option.GNAFPointType	<p>Specifies whether to return the parcel latitude/longitude or the street frontage latitude/longitude. This option is only available if you have the G-NAF database installed. This option only affects addresses matched to the G-NAF database.</p> <p>One of the following:</p> <ul style="list-style-type: none"> P In a street address match, return the exact location of the parcel. This is the standard G-NAF point which is the exact authoritative point returned by the G-NAF database. Default. S In a street address match, return the street frontage point for the parcel. The street frontage point is 12.5 metres from the front boundary of the parcel. Street frontage points are more suitable for routing applications.
Option.Return8DecimalPlaceLatLong	<p>Specifies whether to return the original latitude and longitude, precise up to eight digits after the decimal. This is the latitude/longitude that the candidate matched to in the G-NAF database. These are the original coordinates directly from the G-NAF data prior to truncation or rounding. This option is only available if you have the G-NAF database installed. This option only affects addresses matched to the G-NAF database.</p> <ul style="list-style-type: none"> Y Yes, return the original latitude/longitude, up to eight digits after the decimal. N No, do not return the original latitude/longitude.

G-NAF PID Data Options

Table 20: GNAFPIDLocationSearch Data Options

Parameter	Description
Option.Database	<p>Specifies the database to use to look up the parcel. Use the database name specified in the Management Console. For more information, see the <i>Spectrum™ Technology Platform Administration Guide</i>.</p> <p>Note: Only database resources that contain G-NAF databases are available in this list.</p>

Output

Address Output

Table 21: Address Output

Response Element	Description
AddressLine1	First line of the address.
AddressLine2	Second line of the address.
ApartmentLabel	The type of unit, such as apartment, suite, or lot.
ApartmentNumber	Unit number.

Response Element	Description
City	Municipality name.
Country	The three-letter ISO 3166-1 Alpha 3 country code.
County	The Local Government Authority (LGA).
FirmName	Name of the company or a place name.
HouseNumber	Building number for the matched location.
HouseNumberHigh	The highest house number of the range in which the address resides.
HouseNumberLow	The lowest house number of the range in which the address resides.
HouseNumberParity	Indicates if the house number range contains even or odd numbers or both. E Even O Odd B Both
LastLine	Complete last address line (city, state/province, and postal code).
LeadingDirectional	Street directional that precedes the street name. For example, the N in 138 N Main Street.
Locality	Generally a locality in rural areas or suburb in urban areas.

Response Element	Description
NumberOfCandidateRanges	<p>Indicates whether or not the address has a house number. One of the following:</p> <p>0 The address has no house number. Examples of addresses that have no house number are P.O. box addresses and general delivery addresses.</p> <p>1 The address has a house number. For information about the range in which the house number falls, see the HouseNumberHigh, HouseNumberLow, and HouseNumberParity fields.</p>
NumberOfRangeUnits	<p>Indicates whether or not the address has a unit number, such as a suite number or apartment number. One of the following:</p> <p>0 The address has no unit number.</p> <p>1 The address has a unit number. For information about the range in which the unit number falls, see the UnitNumberHigh and UnitNumberLow.</p>
PostalCode	The postal code for the address. The format of the postcode varies by country.
PostalCode.Addon	The second part of the postcode. For example, for Canadian addresses this will be the LDU. This field is not used by most countries.
PreAddress	Miscellaneous information that appears before the street name.
PrivateMailbox	This field is not currently used.
SegmentParity	<p>Indicates which side of the street has odd numbers.</p> <p>L Left side of the street</p> <p>R Right side of the street</p> <p>B Both sides of the street</p> <p>U Undetermined</p>
StateProvince	The state name.

Response Element	Description
StreetDataType	<p>The default search order rank of the database used to geocode the address. A value of "1" indicates that the database is first in the default search order, "2" indicates that the database is second in the default search order, and so on.</p> <p>The default database search order is specified in the Management Console with the Spectrum Databases page.</p>
StreetName	The street name.
StreetPrefix	<p>The type of street when the street type appears before the base street name. For example, AVENUE:</p> <p>12 AVENUE B KALGOORLIE WA 6430</p>
StreetSuffix	The street type of the matched location. For example, AVE for Avenue.
TrailingDirectional	Street directional that follows the street name. For example, the N in 456 Washington N.
UnitNumberHigh	The highest unit number of the range in which the unit resides.
UnitNumberLow	The lowest unit number of the range in which the unit resides.

Geocode Output

Table 22: Geocode Output for Australia

Response Element	Description
CoordinateSystem	The coordinate system used to determine the latitude and longitude coordinates. A coordinate system specifies a map projection, coordinate units, etc. An example is EPSG:4326. EPSG stands for European Petroleum Survey Group.

Response Element	Description
Latitude	Seven-digit number in degrees and calculated to four decimal places (in the format specified).
Longitude	Seven-digit number in degrees and calculated to four decimal places (in the format specified).

Result Codes

Result codes contain information about the success or failure of the geocoding attempt, as well as information about the accuracy of the geocode.

Note: As the EGM Module transitions its administrative tasks to a web-based Management Console, labels for the options may use different wording than what you see in Enterprise Designer. There is no difference in behavior.

Table 23: Result Code Output for Australia

Response Element	Description
Geocoder.MatchCode	Indicates how closely the input address matches the candidate address. For more information, see Result Codes for International Geocoding on page 40.
IsCloseMatch	Indicates whether or not the address is considered a close match. An address is considered close based on the "Close match criteria" options on the Matching tab. Y Yes, the address is a close match. N No, the address is not a close match.
MultiMatchCount	For street address geocoding, the number of matching address positions found for the specified address. For intersection geocoding, the number of matching street intersection positions found for the specified addresses.

Response Element	Description										
Status	<p>Reports the success or failure of the match attempt</p> <table> <tr> <td>null</td> <td>Success</td> </tr> <tr> <td>F</td> <td>Failure</td> </tr> </table>	null	Success	F	Failure						
null	Success										
F	Failure										
Status.Code	<p>If the geocoder could not process the address, this field will show the reason.</p> <ul style="list-style-type: none"> • Internal System Error • No Geocode Found • Insufficient Input Data • Multiple Matches Found • Exception occurred • Unable to initialize Geocoder • No Match Found 										
Status.Description	<p>If the geocoder could not process the address, this field will show a description of the failure.</p> <table> <tr> <td>Problem + explanation</td> <td>Returned when Status.Code = Internal System Error.</td> </tr> <tr> <td>Geocoding Failed</td> <td>Returned when Status.Code = No Geocode Found.</td> </tr> <tr> <td>No location returned</td> <td>Returned when Status.Code = No Geocode Found.</td> </tr> <tr> <td>No Candidates Returned</td> <td>The geocoder could not identify any candidate matches for the address.</td> </tr> <tr> <td>Multiple Candidates Returned and Keep Multiple Matches not selected</td> <td>The address resulted in multiple candidates. In order for the candidate address to be returned, you must specify <code>KeepMultimatch=Y</code>.</td> </tr> </table>	Problem + explanation	Returned when Status.Code = Internal System Error.	Geocoding Failed	Returned when Status.Code = No Geocode Found.	No location returned	Returned when Status.Code = No Geocode Found.	No Candidates Returned	The geocoder could not identify any candidate matches for the address.	Multiple Candidates Returned and Keep Multiple Matches not selected	The address resulted in multiple candidates. In order for the candidate address to be returned, you must specify <code>KeepMultimatch=Y</code> .
Problem + explanation	Returned when Status.Code = Internal System Error.										
Geocoding Failed	Returned when Status.Code = No Geocode Found.										
No location returned	Returned when Status.Code = No Geocode Found.										
No Candidates Returned	The geocoder could not identify any candidate matches for the address.										
Multiple Candidates Returned and Keep Multiple Matches not selected	The address resulted in multiple candidates. In order for the candidate address to be returned, you must specify <code>KeepMultimatch=Y</code> .										

Response Element	Description
LocationPrecision	A code describing the precision of the geocode. One of the following:
	0 No coordinate information is available for this candidate address.
	1 Interpolated street address.
	2 Street segment midpoint.
	3 Postal code 1 centroid.
	4 Partial postal code 2 centroid.
	5 Postal code 2 centroid.
	6 Intersection.
	7 Point of interest. This is a placeholder value. Spectrum databases do not have POI data, so it is not possible to get this return.
	8 State/province centroid.
	9 County centroid.
	10 City centroid.
	11 Locality centroid.
	12 - 15 (LocationPrecision codes) For AUS, 12 indicates a single close match to a postal (PO Box) location. This can be generated from the standard Street Range database only (not the G-NAF database). For most countries, LocationPrecision codes 12 through 15 are reserved for unspecified custom items.
	12 Single close match to a postal (PO Box) location. This can be generated from the standard street range database only (not the G-NAF database).
	13 Additional point precision for unspecified custom item.
	14 Additional point precision for unspecified custom item.
	15 Additional point precision for unspecified custom item.
	16 The result is an address point.
	17 The result was generated by using address point data to modify the candidates segment data.
	18 The result is an address point that was projected using the centerline offset feature. You must have both a point and a street range database to use the centerline offset feature, and thereby return LocationPrecision 18.

Response Element	Description
StreetDataType	<p>The default search order rank of the database used to geocode the address. A value of "1" indicates that the database is first in the default search order, "2" indicates that the database is second in the default search order, and so on.</p> <p>The default database search order is specified in the Management Console.</p>

G-NAF Output

The following table lists output fields that are unique to the Australian Geocoded National Address File (G-NAF[®]) database. G-NAF is an optional database that is available for all six states and two territories. G-NAF is the only authoritative Australian national index of locality, street and number, validated with geographic coordinates.

Table 24: Australia G-NAF Output

Response Element	Description
AUS.GNAF_ADDRESS_CLASS	<p>The Address_Class is constructed using a combination of elements from the G-NAF Data Dictionary source tables. The components of the Address_Class field are:</p> <ul style="list-style-type: none"> A Alias address record P Principal address record PP Principal primary address record PS Principal secondary address record AP Alias primary address record AS Alias secondary address record

Response Element	Description
AUS.GNAF_CONFIDENCE	<p>A number indicating how many G-NAF datasets the address is found in. A higher confidence level means that the same address was found in more data contributor sources. One of the following:</p> <p><number> The number of datasets the address was found in, minus 1. For example, a value of 0 indicates that the address was found in one contributor's dataset, a value of 1 indicates that the address was found in two contributors' datasets, a value of 2 indicates that the address was found in three contributors' datasets, and so forth.</p> <p>-1 The address could not be found in any G-NAF dataset.</p>
AUS.GNAF_EIGHT_DECIMAL_PLACE_LATITUDE	<p>The parcel latitude, precise to eight digits after the decimal. This is the latitude that the candidate matched to in the G-NAF database. These are the original coordinates directly from the G-NAF data prior to truncation or rounding.</p> <p>This field is only returned if you.</p>
AUS.GNAF_EIGHT_DECIMAL_PLACE_LONGITUDE	<p>The parcel longitude, precise to eight digits after the decimal. This is the longitude that the candidate matched to in the G-NAF database. These are the original coordinates directly from the G-NAF data prior to truncation or rounding.</p> <p>This field is only returned if you.</p>

Response Element	Description
AUS.GNAF_GEOCODE_LEVEL	<p>A number indicating the level of geocode for the address. Every principal address within the G-NAF database has at least a locality level geocode. They may also have a street level geocode and a point level geocode.</p> <p>One of the following:</p> <ul style="list-style-type: none"> 0 No geocode. 1 Parcel level geocode only (no locality or street level geocode). 2 Street level geocode only (no locality or parcel level geocode). 3 Street and parcel level geocodes (no locality geocode). 4 Locality level geocode only (no street or parcel level geocode). 5 Locality and parcel level geocodes (no street level geocode). 6 Locality and street level geocodes (no parcel level geocodes). 7 Locality, street and parcel level geocodes.
AUS_GNAF_PARCEL_ID	<p>The Parcel ID field is the generic parcel id field provided by custodial data, and represents a Lot on Plan description that is useful for government agencies. The exact format varies. G-NAF source data has over 7 million records with a Parcel_ID. The Australia geocoder supplements this to populate over 12,730,000 G-NAF records with a Parcel_ID field.</p>
AUS.GNAF_PID	<p>The G-NAF Persistent Identifier (G-NAF PID) is a 14-character alphanumeric string that uniquely identifies each G-NAF address. The PID is constructed from a combination of the major address fields of the G-NAF database. An example of a G-NAF PID is:</p> <p>GAVIC411711441</p>

Response Element	Description
AUS.GNAF_RELIABILITY	<p data-bbox="808 373 1433 583">A number indicating the geocode precision. Reliability is related to the dictionary used to determine the geocode. Data with geocoded reliability levels 1, 2, and 3 is contained in the GNAF123 Dictionary. This is point (parcel) level geocoded data. Data with geocoded reliability levels 4, 5, and 6 is contained in the GNAF456 Dictionary. This contains non-parcel centroid geocoded data.</p> <ol data-bbox="808 604 1433 1598" style="list-style-type: none"><li data-bbox="808 604 1433 758">1 Geocode accuracy recorded to appropriate surveying standard. For example, this could apply to an address level geocode that was manually geocoded. Geocode resolution is sufficient to place the centroid within address site boundary with a GPS.<li data-bbox="808 779 1433 932">2 Geocode accuracy sufficient to place centroid within address site boundary. For example, this could apply to an address level geocode that was automatically calculated as the centroid of the corresponding cadastre parcel.<li data-bbox="808 953 1433 1142">3 Geocode accuracy sufficient to place centroid near (or possibly within) address site boundary. For example, this could apply to an address level geocode that was automatically calculated by calculating where on the road the address was likely to appear based upon other bounding geocoded addresses.<li data-bbox="808 1163 1433 1283">4 Geocode accuracy sufficient to associate address site with a unique road feature. For example, this could apply to a street level geocode that was automatically calculated by using the road centerline reference data.<li data-bbox="808 1304 1433 1457">5 Geocode resolution sufficient to associate address site with a unique locality or neighborhood. For example, this could apply to a locality level geocode that was automatically calculated as the centroid of the locality.<li data-bbox="808 1478 1433 1598">6 Geocode resolution sufficient to associate address site with a unique region. For example, this could apply to a locality level geocode that was derived from topographic feature.

Response Element	Description
AUS.GNAF_SA1	<p>The Statistical Area Level 1 (SA1) field as the second smallest geographic area defined in the Australian Statistical Geography Standard (ASGS). Mesh Block is the smallest unit. The SA1 is designed for use in the Census of Population and Housing as the smallest unit for the processing and release of Census data. An SA1 is represented by a unique seven digit code.</p>
AUS.LEVEL_NUMBER	<p>The number of a floor or level in a multistory building. For example,</p> <p>Floor 2, 17 Jones Street</p> <p>The G-NAF database includes level information for some Australian states. Level information may be associated with unit information, but not necessarily. If the G-NAF database contains multiple records with the same level, the level information is returned only if the input address contains unique content (such as a unit number). If the G-NAF database has level information for an address, that information is returned with the matched candidate.</p> <p>The correct level information is returned (when available) even if the input address did not include level information, or if the input had the wrong level information. If the input address has level information but the G-NAF database does not include level information for the matching address, then the input level information is discarded since it is not validated in the G-NAF data.</p>

Response Element	Description
AUS.LEVEL_TYPE	<p>The label used for a floor of a multistory building. For example, "Level" or "Floor". In this example, the level type is "Level":</p> <p>Suite 3 Level 7, 17 Jones Street</p> <p>In this example, Suite 3 is a unit.</p> <p>The G-NAF database includes level information for some Australian states. Level information may be associated with unit information, but not necessarily. If the G-NAF database contains multiple records with the same level, the level information is returned only if the input address contains unique content (such as a unit number). If the G-NAF database has level information for an address, that information is returned with the matched candidate.</p> <p>The correct level information is returned (when available) even if the input address did not include level information, or if the input had the wrong level information. If the input address has level information but the G-NAF database does not include level information for the matching address, then the input level information is discarded since it is not validated in the G-NAF data.</p>
AUS.MESH_BLOCK_ID	<p>A Meshblock is the smallest geographic unit for which statistical data is collected by the Australian Bureau of Statistics (ABS). Meshblocks usually contain a minimum of 20 to 50 households. This is about one fifth the size of a Collection District (CD). You can use the Meshblock ID to do additional attributions against your own data.</p>
AUS.LOT_NUMBER	<p>Lot numbers are returned for G-NAF candidates because some rural addresses do not have adequate physical or house number information.</p>
AUS.STREET_TYPE_ABB	<p>This is an abbreviation for the street type. For example, EX is an abbreviation for Extension and FTRL is an abbreviation for Firetrail.</p>

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