

Spectrum Technology Platform

Version 12.0

Geocoding Guide for Macau - API



Table of Contents

1 - GeocodeAddressGlobal

Adding an Enterprise Geocoding Module Global

| | |
|-------------------|----|
| Database Resource | 4 |
| Input | 6 |
| Options | 10 |
| Output | 20 |

2 -

ReverseGeocodeAddressGlobal

| | |
|---------|----|
| Input | 38 |
| Options | 39 |
| Output | 43 |

1 -

GeocodeAddressGlobal

GeocodeAddressGlobal provides street-level geocoding for many countries. It can also determine city or locality centroids, as well as postal code centroids. GeocodeAddressGlobal handles street addresses in the native language and format. For example, a typical French formatted address might have a street name of Rue des Remparts. A typical German formatted address could have a street name Bahnhofstrasse.

Note: GeocodeAddressGlobal does not support U.S. addresses. To geocode U.S. addresses, use GeocodeUSAddress.

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, GeocodeAddressGlobal would be able to geocode addresses in these countries in a single stage. Before you can work with GeocodeAddressGlobal, you must define a global database resource containing a database for one or more countries. Once you create the database resource, GeocodeAddressGlobal will become available.

GeocodeAddressGlobal is an optional component of the Enterprise Geocoding Module.

In this section

| | |
|--|----|
| Adding an Enterprise Geocoding Module Global Database Resource | 4 |
| Input | 6 |
| Options | 10 |
| Output | 20 |

Adding an Enterprise Geocoding Module Global Database Resource

Unlike other stages, the Geocode Address Global and Reverse Geocode Global stages are not visible in Management Console or Enterprise Designer until you define a database resource. New stages are created for each global database resource that you define. For example, if you define one database resource containing databases for Mexico and Canada, and another database resource containing data for Australia and Singapore, you would see two Geocode Address Global stages, one capable of geocoding addresses in Mexico and Canada and the other capable of geocoding addresses in Australia and Singapore. You would also see two Reverse Geocode Global stages, one for Mexico and Canada and one for Australia and Singapore.

Note:

- Australia, Canada, France, Germany, and Japan have large geocoding databases. Do not put more than one or two of these in the same database resource.
- If you are running the Spectrum™ Technology Platform server on a 64-bit machine, database resources should contain no more than eight to ten countries. If you require more, Java memory settings need to be modified. For assistance, contact technical support.



To create a Geocode Address Global 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 InternationalGeocoder GLOBAL.
7. In the **Type** field, select Geocode Address Global.
8. Click the Add button  to install a new dataset. In the **Name** field, specify a name for this dataset. The name can be anything you choose. In the **Path** field specify the folder that contains the datasets for the country you selected. 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. When you click OK, the dataset for the country will be visible in the database resource list on the Add Database page. The 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 datasets you have licensed.



If you are adding more than one dataset for a particular country, each dataset must be located in a separate directory. For example, if you are adding a street dictionary and a point dictionary for the same country, you could specify:

```
<InstallLocation>\IGEO-<CountryCode>\data\Street_dict
```

```
<InstallLocation>\IGEO-<CountryCode>\data\Point_dict
```

where `Street_dict` and `Point_dict` refer to the street dictionary and point dictionaries, respectively.

Note: Do not put datasets on a network drive. Doing so can cause performance problems.

9. If you have additional datasets to add, click the Add button , otherwise click **Save**.
10. If you have additional countries to add, click the Add button  and specify a name and path to each dataset. When finished, click **Save**.

By adding multiple countries to the same database resource, you will create a Geocode Address Global stage that can geocode addresses for each country in one stage.

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.

11. Click **OK** to leave the Add Database page.

12 If there are any open Enterprise Designer sessions, click the refresh button to see the new stage.

Input

GeocodeAddressGlobal 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.

Input Fields

GeocodeAddressMacau takes an address or intersection as input. For Macau, GeocodeAddressGlobal 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 Macau.

Table 1: Input Fields for Macau

| columnName | Description |
|--------------|--|
| 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: Ruta 125 40405 Santo Domingo 2 Travessa Nova Nossa Senhora do Carmo This field can also contain the full address. For more information, see Single Line Input on page 9 For all countries except Argentina, Great Britain, and Japan, this field can contain a street intersection. To specify a street intersection, use double ampersand (&&) to separate the streets. For more information, see Street Intersection Input on page 10. |
| AddressLine2 | This field is not used in this country. |
| City | The city or town name. For most countries, your input address should use the official city name or alias. |
| County | <p>The meaning of county varies by country.</p> <ul style="list-style-type: none"> VNM (Vietnam)—District |
| FirmName | This field is not used in this country. |
| 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. Not every country includes house number data.</p> <p>Note: The house number specified in the HouseNumber field takes precedence over any house number specified in the AddressLine1 field.</p> |
| LastLine | <p>The last line of the address.</p> <ul style="list-style-type: none"> 2 Travessa Nova Nossa Senhora do Carmo |

| columnName | Description |
|---------------|--|
| 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"> • MAC (Macau) —Locality • VNM (Vietnam)—Not used. |
| PostalCode | <p>The postal code in the appropriate format for the country.</p> <p>This field is not used in this country.</p> |
| StateProvince | <p>The meaning of State/Province varies by country.</p> <ul style="list-style-type: none"> • MAC (Macau) — State |

Address Input Guidelines

Follow these suggestions to ensure that your street input data is in the best format possible for optimal geocoding.

Address Guidelines for Macau

Follow these guidelines to provide input that GeocodeAddressGlobal can successfully geocode. For additional information about Macau addresses, see the Macau Post website: <http://www.macaupost.gov.mo/>.

- **Required fields**—Addresses must contain a city. MAC does not consider postal codes in addresses.
- **Thoroughfare types**—Thoroughfare types and their common abbreviations are recognized and fully supported on input and output.
- **Common words and abbreviations**—The geocoder recognizes common words, directionals, house number indicators, and abbreviations used in addresses and can geocode these addresses successfully.

Note: Postal geocoding is not available with Macau.

Single Line Input

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

For all countries except Japan, you can enter addresses in one or more of these single-line formats.

Note: Not all formats may work for every country.

StreetAddress;PostalCode;City

StreetAddress;City;PostalCode

StreetAddress;City

StreetAddress;City;StateProvince;PostalCode

StreetAddress;Locality

StreetAddress;County;City

PostalCode;StreetAddress

PostalCode;StreetAddress;City

City;PostalCode;StreetAddress

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.

Note: Not all of these address elements are used in every country.

Other single-line formats may also be acceptable for many countries.

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,

1 Rua Do Delegado;Nossa Senhora do Carmo

Punctuation is ignored for geocoding purposes.

Guidelines for Single Line Input

- Punctuation is generally ignored, however you may improve results and performance by using separators (commas, semicolons, etc.) between different address elements.

- 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 some countries, the word AND can also be used to delimit intersections. The && delimiter can be used for all countries. For example:

Rua Norte && Patio Novo
Macau

Note: The double ampersand (&&) can always be used as a street intersection separator. For some countries, you can use additional symbols or words to delimit street intersections.

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

Options

Geocode Address Global includes geocoding, matching, and data options.

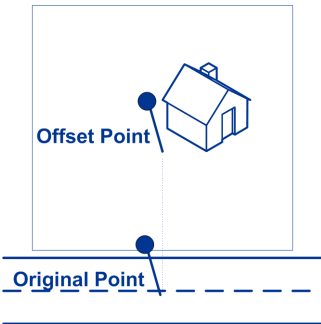
Geocoding Options

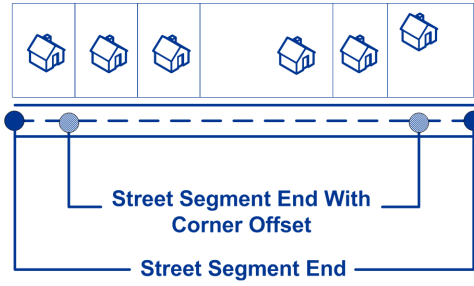
The following table lists the options that control how a location's coordinates are determined.

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 2: Geocoding Options for Macau

| optionName | Description | |
|----------------------|--|---|
| GeocodeLevel | Specifies how precisely you want to geocode addresses. One of the following: | |
| | 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. |
| | PostalCentroid | This option is not available for this country. If postal code data is available, 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. |
| | GeographicCentroid | The geocoder attempts to geocode addresses to the geographic centroid of a city or state. |
| Interpolation | Y | Yes, perform address point interpolation. |
| | N | No, do not perform address point interpolation. |
| FallbackToGeographic | Specifies whether to attempt to determine a geographic region centroid when an address-level geocode cannot be determined. | |
| | Y | Yes, determine a geographic centroid when an address-level centroid cannot be determined. Default. |
| | N | No, do not determine a geographic centroid when an address-level centroid cannot be determined. |
| FallbackToPostal | Y | Yes, determine a postal code centroid when an address-level centroid cannot be determined. Default. |
| | N | No, do not determine a postal code centroid when an address-level centroid cannot be determined. |

| optionName | Description |
|------------------|--|
| OffsetFromStreet | <p data-bbox="570 373 1429 468">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="570 478 1429 510">The default value varies by country. For most countries, the default is 7 meters.</p> <p data-bbox="570 520 1429 877">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="570 1241 1429 1297">Street coordinates are accurate to 1/10,000 of a degree and interpolated points are accurate to the millionths of a degree.</p> |

| optionName | Description |
|------------------|--|
| OffsetFromCorner | <p data-bbox="552 367 1438 493">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 data-bbox="552 504 1438 577">Note: Offset is not supported for the United Kingdom (GBR) or Japan (JPN).</p> <p data-bbox="552 588 1438 630">The default value varies by country:</p> <ul data-bbox="552 640 1438 714" 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 data-bbox="552 724 1438 766">The following diagram compares the end points of a street to offset end points.</p>  |
| OffsetUnits | <p data-bbox="552 1123 1438 1186">Specifies the unit of measurement for the street offset and corner offset options. One of the following:</p> <ul data-bbox="552 1197 1438 1344" style="list-style-type: none"> • Feet • Miles • Meters • Kilometers <p data-bbox="552 1354 1438 1396">The default is Meters.</p> |
| CoordinateSystem | <p data-bbox="552 1459 1438 1606">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 data-bbox="552 1617 1438 1690">Each country supports different coordinate systems. Depending on the country, you have one or more of the following options:</p> <p data-bbox="552 1701 1438 1770">EPSG:4326 Also known as the WGS84 coordinate system.</p> |

| optionName | Description |
|---------------|--|
| IncludeInputs | <p data-bbox="552 367 1437 525">Specifies whether to return the formatted input street address and each input address element in a separate field. This feature can help you understand how the input address was parsed and identify specific input elements that could not be geocoded. For example, a returned HouseNumber.Input could contain an invalid house number in your input address.</p> <p data-bbox="552 535 1437 598">You can specify parsed input returns for a specific country. For example, a REST API example for Canada is:</p> <div data-bbox="552 609 1437 682" style="background-color: #f0f0f0; padding: 5px; margin: 5px 0;"> <pre data-bbox="552 609 1437 682">Option.CAN.IncludeInputs=Y</pre> </div> <p data-bbox="552 693 1437 787">Note: Data vintage must be 2014 Q4 or newer to get Parsed Address Input returns. Also note that Parsed Address Input elements are not returned for every country.</p> <p data-bbox="552 808 1437 871">Parsed Address Input elements are returned in separately labeled fields names with a .Input extension. For example:</p> <ul data-bbox="552 892 1437 1155" style="list-style-type: none"> • FormattedInputStreet.Input • City.Input • Country.Input • HouseNumber.Input • Locality.Input • PostalCode.Base.Input • StreetName.Input • StreetSuffix.Input <p data-bbox="552 1165 1437 1228">Other labeled fields are possible depending on the input address, country, and data source.</p> <p data-bbox="552 1239 1437 1365">Note: Parsed Address Input elements are not returned for every country. Also, because Geocode Address World geocodes to the geographic or postal level only (not street address), this does not return Parsed Address Input</p> <p data-bbox="552 1386 1437 1449">For many countries, if part of the input address could not be recognized as a specific address element, this content is returned in UnparsedWords.Input.</p> <p data-bbox="552 1459 1437 1522">For intersection addresses, the first entered street is returned in StreetName.Input and the second entered street name is returned in IntersectionIdStreet2.Input.</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.

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 3: Matching Options for Macau

| optionName | Description |
|----------------|---|
| 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 using the 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> |
| MaxCandidates | <p>If you specify KeepMultimatch=Y, this option specifies the maximum number of results to return. The default is 1. Specify -1 (minus one) to return all possible candidates.</p> |
| ReturnRanges | <p>Specifies whether to return address range information. If you enable this option, the output field <code>Ranges</code> will be included in the output.</p> <p>A range is a series of addresses along a street segment. For example, 5400-5499 Main St. is an address range representing addresses in the 5400 block of Main St. A range may represent just odd or even addresses within a segment, or both odd and even addresses. A range may also represent a single building with multiple units, such as an apartment building.</p> <p>Y Yes, return address range information.</p> <p>N No, do not return address range information. Default.</p> |
| MaxRanges | <p>If you choose to return ranges, this option specifies the maximum number of ranges to return for each candidate. Since the geocoder returns one candidate per segment, and since a segment may contain multiple ranges, this option allows you to see the other ranges in a candidate's segment.</p> |

| optionName | Description |
|----------------------|---|
| MaxRangeUnits | <p>If you choose to return ranges, this option specifies the maximum number of units (for example, apartments or suites) to return for each range.</p> <p>For example, if you were to geocode an office building at 65 Main St. containing four suites, there would be a maximum of four units returned for the building's range (65 Suite 1, 65 Suite 2, 65 Suite 3, and 65 Suite 4). If you were to specify a maximum number of units as 2, then only two units would be returned instead of all four.</p> |
| 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> |
| 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 for most countries.</p> <p>RelaxedMode All candidate addresses are considered a close match.</p> |
| 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> |
| MustMatchHouseNumber | <p>Specifies whether candidates must match the house number to be considered a close match.</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> |

| optionName | Description |
|-------------------|--|
| 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> |
| MustMatchLocality | <p>Specifies whether candidates must match the locality (or equivalent) to be considered a close match. The meaning of Locality varies for different countries.</p> <ul style="list-style-type: none"> • MAC (Macau) —Locality <p>Y Yes, a candidate must match the locality to be considered a close match.</p> <p>N No, a candidate does not have to match the locality to be considered a close match.</p> |
| MustMatchCity | <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> |
| MustMatchCounty | <p>Specifies whether candidates must match the county (or equivalent) to be considered a close match. The meaning of county varies for different countries.</p> <p>One of the following:</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> |

| optionName | Description |
|---------------------------|--|
| MustMatchStateProvince | <p>Specifies whether candidates must match the state or province (or equivalent) to be considered a close match.</p> <ul style="list-style-type: none"> • MAC (Macau) — State <p>One of the following:</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> |
| MustMatchPostalCode | <p>This field is not used in this country.</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> |
| 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> |

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".

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.

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

Table 4: Data Options for Macau

| optionName | Description |
|--------------------|---|
| Database | Specifies the database to be used for geocoding. Only databases that have been defined in the Management Console are available. |
| DatabasePreference | <p>Specifies which geocoding databases to use. One of the following:</p> <p>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.</p> <p>PreferStandard Use both standard databases and custom databases, but give preference to candidates from standard databases.</p> <p>CustomOnly Use only custom databases. Ignore standard databases.</p> <p>StandardOnly Use only standard databases. Ignore custom databases.</p> <p>Both Use both standard databases and custom databases. In cases where candidates are returned from both, the standard database is preferred. Default.</p> <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 32.</p> |

| optionName | Description |
|---------------------|--|
| 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

The geocoder 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. The information is returned in upper case.

If you are using the API, the output returned is in the `DataTable` class. For more information, see the Spectrum™ Technology Platform API Guide.

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.

Note: The output casing for fields for Great Britain has changed to upper case, as of the Q1 2016 Data update.

Table 5: Address Output for Macau

| columnName | Description |
|-----------------------|--|
| AddressLine1 | First line of the address. |
| AddressLine2 | Second line of the address. |
| ApartmentLabel | The type of unit, such as apartment, suite, or lot. |
| ApartmentLabel.Input | The type of unit, such as apartment, suite, or lot as it was input. |
| ApartmentNumber | Unit number. |
| ApartmentNumber.Input | Unit number as it was input |
| City | The municipality name. |
| City.Input | The municipality name as it was input. For Japan, the municipality subdivision (sub-city) |
| Country | <p>The three-letter ISO 3166-1 Alpha 3 country code.</p> <p>For Macau, the country code is MAC.</p> <p>Addresses for countries that do not have a dedicated geocoding stage return the country code associated with the input address. For example, Vatican City addresses return VAT in the Country field, regardless of whether VAT or ITA (Italy) was passed as the country code. Similarly, addresses in Martinique return MTQ (rather than FRA) in the Country field.</p> |
| Country.Input | <p>The three-letter ISO 3166-1 Alpha 3 country code as it was input.</p> <p>For Macau, the country code is MAC.</p> <p>Addresses for countries that do not have a dedicated geocoding stage return the country code associated with the input address. For example, Vatican City addresses return VAT in the Country field, regardless of whether VAT or ITA (Italy) was passed as the country code. Similarly, addresses in Martinique return MTQ (rather than FRA) in the Country field.</p> |

| columnName | Description |
|-----------------------------|---|
| County | The meaning of county varies by country. • VNM (Vietnam)—District |
| FirmName | Name of the company or a place name. |
| FirmName.Input | Name of the company or a place name as it was input. |
| FormattedInputStreet.Input | The street as it was input. |
| Geocoder.MatchCode | |
| HouseNumber | The number for the matched location. |
| HouseNumber.Input | The number for the matched location as it was input |
| 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 |
| IntersectionIdStreet2.Input | The second street in an intersection address as it was input. |
| IsCloseMatch | Indicates whether candidate is a close match. |

| columnName | Description |
|--------------------------|--|
| Language | For reverse geocoded candidates, the two-character language code is returned. |
| LastLine | Complete last address line (city, state/province, and postal code). |
| Latitude | Latitude of the candidate. |
| LeadingDirectional | Street directional that precedes the street name. For example, the N in 138 N Main Street. |
| LeadingDirectional.Input | Street directional that precedes the street name as it was input. |
| 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"> • MAC (Macau) —Locality • VNM (Vietnam)—Not used. |
| Locality.Input | <p>The locality as it was input.</p> <ul style="list-style-type: none"> • MAC (Macau) —Locality |
| Longitude | Longitude of the candidate. |
| 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. To specify the number of units to return for each range, use the <code>MaxRangeUnits</code> option. |
| PostalCode | The postal code for the address. The format of the postcode varies by country. Postcode data is not available for every country. |

| columnName | Description |
|------------------------|--|
| PostalCode.Addon | The second part of a postcode. This field is not used by most countries. |
| PostalCode.Addon.Input | The second part of a postcode as it was input. This field is not used by most countries. |
| PostalCode.Base | The first part of a postcode. This field is not used by most countries. |
| PostalCode.Base.Input | The first 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. |

| columnName | Description |
|------------|-------------|
|------------|-------------|

Ranges

| columnName | Description |
|--------------------------------|--|
| | <p>This is a list field containing the address ranges that exist on the street segment where the candidate address is located.</p> <p>A range is a series of addresses along a street segment. For example, 5400-5499 Main St. is an address range representing addresses in the 5400 block of Main St. A range may represent just odd or even addresses within a segment, or both odd and even addresses. A range may also represent a single building with multiple units, such as an apartment building.</p> <p>The Ranges field contains the following sub-fields:</p> |
| Address | This is a list field that contains sub-fields for any address elements (AddressLine1, City, and so on) that are different from the candidate's address. |
| AdditionalFields | A listing of country-specific information related to the address. The information contained in AdditionalFields varies by country. |
| HouseNumberHigh | The highest address number for the range. |
| HouseNumberLow | The lowest address number for the range. |
| SegmentParity | <p>Indicates the side of the street where the range is located. One of the following:</p> <ul style="list-style-type: none"> 0 It is not known which side of the street the range is located on. 1 The range is on the left side of the street. 2 The range is on the right side of the street. |
| HouseNumberParity | <p>Indicates whether the range contains odd or even address numbers. One of the following:</p> <ul style="list-style-type: none"> 0 The range contains both odd and even address numbers. 1 The range contains odd address numbers 2 The range contains even address numbers. -1 It is not known whether the range contains odd or even house numbers. |
| TotalRangeUnitsReturned | The number of unit ranges returned for the address. A unit is an address within a building, such as an apartment or suite. |
| RangeUnits | <p>A list of the ranges of units within the building. An example of units are apartments or suites.</p> <p>Address This is a list field that contains sub-fields for any address elements (AddressLine1, City,</p> |

| columnName | Description |
|---------------------|---|
| | and so on) that are different from the candidate's address. |
| | UnitNumberHigh The highest unit number. |
| | UnitNumberLow The lowest unit number. |
| 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 |
| StateProvince | The meaning of State/Province varies by country. <ul style="list-style-type: none"> • MAC (Macau) — State |
| StreetDataType | 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. The default database search order is specified in the Management Console. |
| 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. |

| columnName | Description |
|-----------------------|---|
| UnitNumberLow | The lowest unit number of the range in which the unit resides. |
| Return Parsed Address | The formatted input address can be returned along with a separate returned field for each input address element. Parsed Address Input elements are returned in separately labeled fields names with a .Input extension. See Result Codes on page 28 |

Geocode Output

Table 6: Geocode Output for Macau

| columnName | 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. |
| 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 7: Result Code Output for Macau

| columnName | Description |
|--------------------|---|
| Geocoder.MatchCode | Indicates how closely the input address matches the candidate address. For more information, see Result Codes for International Geocoding on page 32. |
| 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. |
| Status | Reports the success or failure of the match attempt null Success F Failure |
| Status.Code | If the geocoder could not process the address, this field will show the reason. <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 |

| columnName | Description |
|--------------------|---|
| Status.Description | <p>If the geocoder could not process the address, this field will show a description of the failure.</p> <p>Problem + explanation Returned when Status.Code = Internal System Error.</p> <p>Geocoding Failed Returned when Status.Code = No Geocode Found.</p> <p>No location returned Returned when Status.Code = No Geocode Found.</p> <p>No Candidates Returned The geocoder could not identify any candidate matches for the address.</p> <p>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>.</p> |

| columnName | Description |
|-------------------|---|
| LocationPrecision | <p>A code describing the precision of the geocode. One of the following:</p> <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. 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 most countries, LocationPrecision codes 12 through 15 are reserved for unspecified custom items. 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. |
| 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> |

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 8: 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 33 |
| 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 33. |
| 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. |
| 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. |
| 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. 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 9: 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. Macau 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 10: 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. |
| 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 11: Reverse Geocoding (R) Result Codes

| Reverse Geocoding Code | Description |
|------------------------|--|
| RS8A | Point/parcel level precision for reverse geocoding. Candidate returned from address dictionary. |
| RS5A | Interpolated street candidate for reverse geocoding. Candidate returned from address dictionary. |
| RS4A | Street centroid candidate for reverse geocoding. Candidate returned from address dictionary. |

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.

2 -

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

| | |
|---------|----|
| Input | 38 |
| Options | 39 |
| Output | 43 |

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.

Note: Specify input using the `DataTable` class. For more information, see the Spectrum™ Technology Platform API Guide.

Table 12: ReverseGeocodeGlobal Input

| columnName | Format | Description |
|------------|--------|---|
| Latitude | String | The latitude of the point for which you want address information. |
| Longitude | String | The longitude of the point for which you want address information. |
| 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 13: Geocoding Options for Macau

| optionName | Description |
|----------------|---|
| 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. |
| Units | The units in which the search distance is specified. One of the following: <ul style="list-style-type: none">• Feet• Miles• Meters• Kilometers |

optionName

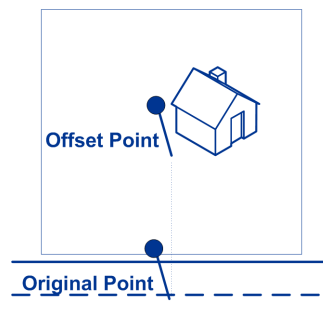
Description

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 OffsetUnits option.

The default value varies by country. For most countries, the default is 7 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.

| optionName | Description |
|------------------|---|
| 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>  |
| 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> |
| 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> <p>EPSG:4326 Also known as the WGS84 coordinate system.</p> |

Matching Options

Table 14: Matching Options for Macau

| optionName | Description |
|---------------------------|--|
| 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 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> |
| MaxCandidates | <p>If you specify KeepMultimatch=Y, this option specifies the maximum number of results to return. The default is 1. Specify -1 (minus one) to return all possible candidates.</p> |
| 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 15: Data Options for Macau

| optionName | Description |
|---------------------|--|
| 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 16: Reverse Geocode Address Global Output Fields

| columnName | 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. |

| columnName | Description | | | | | | | | |
|--------------------|--|----------|------|----------|-----|----------|------|----------|---------|
| County | The meaning of county varies by country. <ul style="list-style-type: none"> • VNM (Vietnam)—District | | | | | | | | |
| Distance | The distance from input location in meters. If the input coordinates are an exact match for the address, the value is 0. | | | | | | | | |
| FirmName | Name of the company or a place name. | | | | | | | | |
| Geocoder.MatchCode | Indicates how closely the input coordinates match the candidate address. For more information, see Reverse Geocoding Codes (R Codes) on page 35. | | | | | | | | |
| HouseNumber | The 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. <table border="0"> <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> </table> | E | Even | O | Odd | B | Both | U | Unknown |
| E | Even | | | | | | | | |
| O | Odd | | | | | | | | |
| B | Both | | | | | | | | |
| U | Unknown | | | | | | | | |
| Language | For reverse geocoded candidates, the two-character language code is returned. | | | | | | | | |
| LastLine | Complete last address line (city, state/province, and postal code). | | | | | | | | |

| columnName | Description |
|-------------------------|--|
| LeadingDirectional | Street directional that precedes the street name. For example, the N in 138 N Main Street. |
| 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">• MAC (Macau)—Locality• 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. To specify the number of units to return for each range, use the <code>MaxRangeUnits</code> option. |
| 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. |
| SegmentCode | A unique ID that identifies a street segment. |

| columnName | Description |
|---------------------|---|
| 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 | <p>The meaning of State/Province varies by country.</p> <ul style="list-style-type: none"> • MAC (Macau) — 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. |
| UnitNumberLow | The lowest unit number of the range in which the unit resides. |

Notices

© 2017 Pitney Bowes Software Inc. All rights reserved. MapInfo and Group 1 Software are trademarks of Pitney Bowes Software Inc. All other marks and trademarks are property of their respective holders.

USPS® Notices

Pitney Bowes Inc. holds a non-exclusive license to publish and sell ZIP + 4® databases on optical and magnetic media. The following trademarks are owned by the United States Postal Service: CASS, CASS Certified, DPV, eLOT, FASTforward, First-Class Mail, Intelligent Mail, LACS^{Link}, NCOA^{Link}, PAVE, PLANET Code, Postal Service, POSTNET, Post Office, RDI, Suite^{Link}, United States Postal Service, Standard Mail, United States Post Office, USPS, ZIP Code, and ZIP + 4. This list is not exhaustive of the trademarks belonging to the Postal Service.

Pitney Bowes Inc. is a non-exclusive licensee of USPS® for NCOA^{Link}® processing.

Prices for Pitney Bowes Software's products, options, and services are not established, controlled, or approved by USPS® or United States Government. When utilizing RDI™ data to determine parcel-shipping costs, the business decision on which parcel delivery company to use is not made by the USPS® or United States Government.

Data Provider and Related Notices

Data Products contained on this media and used within Pitney Bowes Software applications are protected by various trademarks and by one or more of the following copyrights:

- © Copyright United States Postal Service. All rights reserved.
- © 2014 TomTom. All rights reserved. TomTom and the TomTom logo are registered trademarks of TomTom N.V.
- © 2016 HERE
- Fuente: INEGI (Instituto Nacional de Estadística y Geografía)
- Based upon electronic data © National Land Survey Sweden.
- © Copyright United States Census Bureau
- © Copyright Nova Marketing Group, Inc.
- Portions of this program are © Copyright 1993-2007 by Nova Marketing Group Inc. All Rights Reserved
- © Copyright Second Decimal, LLC
- © Copyright Canada Post Corporation
- This CD-ROM contains data from a compilation in which Canada Post Corporation is the copyright owner.
- © 2007 Claritas, Inc.

The Geocode Address World data set contains data licensed from the GeoNames Project (www.geonames.org) provided under the Creative Commons Attribution License ("Attribution

License") located at <http://creativecommons.org/licenses/by/3.0/legalcode>. Your use of the GeoNames data (described in the Spectrum™ Technology Platform User Manual) is governed by the terms of the Attribution License, and any conflict between your agreement with Pitney Bowes Software, Inc. and the Attribution License will be resolved in favor of the Attribution License solely as it relates to your use of the GeoNames data.



3001 Summer Street
Stamford CT 06926-0700
USA

www.pitneybowes.com