Spectrum Technology Platform

Version 12.0 SP1

Geocoding Guide for Japan - REST

Table of Contents

1 - GeocodeAddressGlobal

2 - Input

3 - Options

4 - Output

5 - ReverseGeocodeAddressGlobal

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

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).

6. In the **Module** field, select InternationalGeocoder GLOBAL.

7. In the **Type** field, select Geocode Address Global.

   If you had extracted your .SPD files and placed them in the `\server\app\dataimport` folder, Spectrum would automatically add them to the `\repository\datastorage` folder. You will see a list of datasets in the Add Database screen.

8. Select the dataset(s) you want to add to the database as a resource. Use the Filter text box to search for a dataset when you have a long list.

9. Save the database.

10. If you have a custom dictionary you wish to geocode against, click the Add button and provide a name, country and path to the dictionary. Do not use the Add button to add datasets to the standard database.

    A custom database is a user-defined database that contains addresses and latitude/longitude coordinates that you can use for geocoding.

    > **Note:** You must have a licensed standard database on your system in order to configure and geocode to a custom dictionary.

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

2 - 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.

In this section

Input Fields

GeocodeAddressJapan takes an address or intersection as input. For Japan, 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 Japan.

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 Japan

For information about Japanese addresses, see the Japan Post website: **http://www.post.japanpost.jp**.

A typical Japanese address looks like this:

北海道札幌市中央区大通西２８丁目３番２２号

The elements of this address are described in the following table.

Table 1: Japanese Address Elements

Address Element	Field Name	Example
Prefecture	StateProvince	北海道
City (Shi)	County	札幌市中央区

Address Element	Field Name	Example
Municipality Subdivision (Oaza)	City	大通西
City District (Chome)	Locality	２８丁目
Block/lot number	AddressLine1	３番２２号 Block and lot numbers are the most specific address elements in Japan. Japanese addresses typically do not have street names.

For multiline addresses in Kanji, the general pattern is to enter the postal code on the first line. On the second line, enter the other address elements starting from largest (prefecture) to smallest. The name of the recipient, business, or organization is entered on the third line. For example:

100-8994
東京都中央区八重洲一丁目5番3号
東京中央郵便局

For multiline addresses using Western conventions, the order of address elements is reversed. For example:

Tokyo Central Post Office
5-3, Yaesu 1-Chome
Chuo-ku, Tokyo 100-8994

Japanese addresses can be returned in the character set in which the address was entered. This means that addresses entered in English (Latin character set) are returned in English and Japanese addresses are returned in Japanese (Kanji character set).

By convention, Kanji Japanese addresses are written with the largest administrative division first followed by the smaller area divisions, with the lot number last. English translated addresses can maintain this Japanese addressing order. However, in some business practices the English translated addresses are written with the smaller administrative units first in keeping with Westernized address conventions. The Enterprise Geocoding Module accepts English language addresses in either addressing convention. For example, either of the following address formats are acceptable.

```
Tokyo Shibuya-ku Hiroo 1-1-39
1-1-39 Hiroo, Shibuya-ku, Tokyo
```

Handling House Number Matches

In Japan given the irregular shape of street blocks and house numbers not being linear the next closest number does not necessarily mean the closest house geographically. So, instead of returning an address with the next closest house number a result without a house number is returned.

Kyoto Addresses

In the city of Kyoto, the chome (an urban ward or district, AreaName 4) is a name rather than numeric. This makes it more difficult to distinguish the chome from other numeric addreess elements. Consider the following address:

```
Nishikubo Keihokuakashicho Ukyo-ku Kyoto-shi Kyoto-fu 601-0273
```

In this address, the data for the matching address contains the address elements:

```
AN4 (chome): Nishikubo
AN3 (subcity): keihokuakeshichou
AN2 (city): Kyoto-shi Ukyo-ku
```

There are other examples in which the source data for Kyoto addreesses does not have a chome or for which a chome is present but no subcity (AreaName3) exists.

Sapporo Addresses

Addersses In the city of Sapporo have a unique format than is different than the format for other Japanese cities. Consider the following addresses:

```
5-26 Minami 2 Jo Nishi 6 Chome Sapporo
```

This address is interpreted as follows:

```
Minami 2 Jo -> means 2 blocks south of intersection
Nishi 6 Chome -> means 6 blocks west of intersection
Minami 2 Jo Nishi -> these combine to form the subcity name (AN3)
```

The directionals used in Sapporo addresses are;

```
KITA – north
MINAMI – south
NISHI – west
HIGASHI – east
```

There are many other variations of Sapporo addresses, including variable placement of chome, reversal of chome and jo, and presence/absence and placement of block/lot. These factors can make it difficult to return Sapporo addresses with exact accuracy.

Handling Concatenated Area Names

The AreaName3 (subcity) in addresses can appear as separate words, hyphenated, or concatenated. For example:

```
ogi machi
ogi-machi
ogimachi
```

All of these variations can be recognized and the correct candidate is returned.

It is also common for addresses to be entered without spaces between the areanames. For example:

```
MASHIKO 2070 HAGAGUNMASHIKOMACHI TOCHIGI 3214299
```

This can be recognized and geocoded. The same address with a space between the AreaName3 (subcity) and AreaName2 (city) is also handled correctly:

```
MASHIKO 2070 HAGAGUN MASHIKOMACHI TOCHIGI 3214299
```

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 work 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.
- *Locality* is the locality name.

> **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,

Punctuation is ignored for geocoding purposes.

Format for Japan

Japanese addresses are typically written in single line format, without any delimiters to separate address fields. The typical format is:

```
<prefecture><city><municipality subdivision><city
district><block><lot><other>
```

where:

- prefecture = ken
- city = shi
- municipality subdivision = oaza
- city district = chome
- block = numbered city block (ban)
- lot = sub blocks or building number (go)
- other = building names, flat numbers, or other identifiers. This information is ignored by the Japan geocoder.

> **Note:** Block and lot numbers are the most specific address elements in Japan. Japanese addresses typically do not have street names.

Table 2: Example Japanese Addresses

Address	Description
東京都 渋谷区 広尾1-1-39	Chome, block, and lot separated by a hyphens.

Address	Description
東京都渋谷区 広尾1丁目1-39	Block and lot separated by hyphen, chome indicated by chome identifier.
東京都渋谷区 広尾1丁目1番39号	Chome, block, and lot separated by their identifiers.

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:

> **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.

3 - Options

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

In this section

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 3: Geocoding Options for Japan

Parameter	Description	
Option.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	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.
Option.Interpolation	**Y**	Yes, perform address point interpolation.
	N	No, do not perform address point interpolation.
Option.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.

Parameter	Description
Option.FallbackToPostal	Specifies whether to attempt to determine a postal code centroid when an address-level geocode cannot be determined.

<table>
<tr><td>**Y**</td><td>Yes, determine a postal code centroid when an address-level centroid cannot be determined. Default.</td></tr>
<tr><td>**N**</td><td>No, do not determine a postal code centroid when an address-level centroid cannot be determined.</td></tr>
</table>

Parameter	Description
Option.CoordinateSystem	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).

Each country supports different coordinate systems. Depending on the country, you have one or more of the following options:

EPSG:4301	Also known as the Tokyo coordinate system.
EPSG:4326	Also known as the WGS84 coordinate system.

Parameter	Description
Option.IncludeInputs	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.

You can specify parsed input returns for a specific country. For example, a REST API example for Canada is:

```
Option.CAN.IncludeInputs=Y
```

> **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.

Parsed Address Input elements are returned in separately labeled fields names with a .Input extension. For example:

- FormattedInputStreet.Input
- City.Input
- Country.Input
- HouseNumber.Input
- Locality.Input
- PostalCode.Base.Input
- StreetName.Input
- StreetSuffix.Input

Other labeled fields are possible depending on the input address, country, and data source.

> **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

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.

For intersection addresses, the first entered street is returned in StreetName.Input and the second entered street name is returned in IntersectionIdStreet2.Input.

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 4: Matching Options for Japan

Parameter	Description
Option.KeepMultimatch	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.
	If you select this option, specify the maximum number of candidates to return using the MaxCandidates option (see below).
	Y Yes, return candidates when multiple candidates are found. Default.
	N No, do not return candidates. Addresses that result in multiple candidates will fail to geocode.
Option.MaxCandidates	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.
Option.ReturnRanges	Specifies whether to return address range information. If you enable this option, the output field `Ranges` will be included in the output.
	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.
	Y Yes, return address range information.
	N No, do not return address range information. Default.
Option.MaxRanges	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.

Parameter	Description
Option.MaxRangeUnits	If you choose to return ranges, this option specifies the maximum number of units (for example, apartments or suites) to return for each range.
	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.

Option.CloseMatchesOnly	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.
	Y Yes, return only close matches.
	N No, do not return only close matches. Default.

Option.MatchMode	Specifies how to determine whether a candidate is a close match. One of the following:
	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.
	RelaxedMode All candidate addresses are considered a close match. This is the default value for Japan.

Option.MustMatchInput	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.
	Y Yes, a candidate must match all input to be considered a close match.
	N No, a candidate does not have to match all input to be considered a close match. Default.

Option.MustMatchHouseNumber	**Y** Yes, a candidate must match the house number to be considered a close match.
	N No, a candidate does not have to match the house number to be considered a close match.

Parameter	Description
Option.MustMatchStreet	Specifies whether candidates must match the street name to be considered a close match.
	This option is not used for this country.
	Y Yes, a candidate must match the street name to be considered a close match.
	N No, a candidate does not have to match the street name to be considered a close match.
Option.MustMatchLocality	• JPN (Japan)—City district (chome)
	Y Yes, a candidate must match the locality to be considered a close match.
	N No, a candidate does not have to match the locality to be considered a close match.
Option.MustMatchCity	Specifies whether candidates must match the municipality subdivision (oaza) 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.
	Y Yes, a candidate must match the city to be considered a close match.
	N No, a candidate does not have to match the city to be considered a close match.
Option.MustMatchCounty	Specifies whether candidates must match the county (or equivalent) to be considered a close match. The meaning of county varies for different countries.
	• JPN (Japan)—City (shi)
	One of the following:
	Y Yes, a candidate must match the county to be considered a close match.
	N No, a candidate does not have to match the county to be considered a close match.

Parameter	Description
Option.MustMatchStateProvince	Specifies whether candidates must match the state or province (or equivalent) to be considered a close match.
	This option is not used for this country.
	• JPN (Japan)—Prefecture
	One of the following:
	Y Yes, a candidate must match the state or province to be considered a close match.
	N No, a candidate does not have to match the state or province to be considered a close match.
Option.MustMatchPostalCode	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.
	Y Yes, a candidate must match the postal code to be considered a close match.
	N No, a candidate does not have to match the postal code to be considered a close match.
Option.SortCandidatesUsingLocale	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).
	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.
	Y Yes, candidates are sorted and returned based on input language.
	N No, candidates are returned in the order that the dictionary was added to the database, regardless of input language.

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 5: Data Options for Japan

Parameter	Description
Option.Database	Specifies the database to be used for geocoding. Only databases that have been defined in the Management Console are available.

Parameter	Description
Option.DatabasePreference	Specifies which geocoding databases to use. One of the following:

<table>
<tr><td>PreferCustom</td><td>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.</td></tr>
<tr><td>PreferStandard</td><td>Use both standard databases and custom databases, but give preference to candidates from standard databases.</td></tr>
<tr><td>CustomOnly</td><td>Use only custom databases. Ignore standard databases.</td></tr>
<tr><td>StandardOnly</td><td>Use only standard databases. Ignore custom databases.</td></tr>
<tr><td>Both</td><td>Use both standard databases and custom databases. In cases where candidates are returned from both, the standard database is preferred. Default.</td></tr>
</table>

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 35.

Option.DatabaseSearchOrder	The name of one or more database resources to use in the search process. Use the database name specified in the Management Console.

You can specify multiple database resources. If you specify more than one database, list them in order of preference.

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.

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.

4 - 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.

In this section

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 6: Address Output for Japan

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.
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 name. For Japan, the municipality subdivision (sub-city)
City.Input	The name as it was input. For Japan, the municipality subdivision (sub-city) For Japan, the municipality subdivision (sub-city)

Response Element	Description
Country	The three-letter ISO 3166-1 Alpha 3 country code.
	For Japan, the country code is JPN.
	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.
Country.Input	The three-letter ISO 3166-1 Alpha 3 country code as it was input.
	For Japan, the country code is JPN.
	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.
County	The meaning of county varies by country.
	• JPN (Japan)—City (shi)
	The city (shi) name.
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 lot number for the matched location.
	For Japan, this field contains the lot number.
HouseNumber.Input	The lot number for the matched location as it was input
	For Japan, this field contains the lot number.

Response Element	Description
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.
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	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. • JPN (Japan)—City district (chome)

Response Element	Description
Locality.Input	The locality as it was input. • JPN (Japan)—City district (chome)
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 `MaxRanges` 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.
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.

Response Element	Description
Ranges	

Response Element	Description
	This is a list field containing the address ranges that exist on the street segment where the candidate address is located.

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.

The Ranges field contains the following sub-fields:

Address	This is a list filed 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	Indicates the side of the street where the range is located. One of the following:

	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	Indicates whether the range contains odd or even address numbers. One of the following:

	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	A list of the ranges of units within the building. An example of units are apartments or suites.

	Address	This is a list filed that contains sub-fields for any address elements (AddressLine1, City,

Response Element	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 an individual address. In Japan, this is the Jusho code. A Jusho Code is a point ID that represents a unique address.
SegmentParity	Indicates which side of the street has odd numbers.
	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. • JPN (Japan)—Prefecture
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. In Japan, this contains the block. Japanese addresses typically do not have street names.
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.

Response Element	Description
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.
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 32

Geocode Output

Table 7: Geocode Output for Japan

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.
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 8: Result Code Output for Japan

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 35.
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

Response Element	Description
Status.Code	If the geocoder could not process the address, this field will show the reason.
	• Internal System Error • No Geocode Found • Insufficient Input Data • Multiple Matches Found • Exception occurred • Unable to initialize Geocoder • No Match Found
Status.Description	If the geocoder could not process the address, this field will show a description of the failure.

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 `KeepMultimatch=Y`.

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 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 — 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.

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. For Japan, S1 indicates that the candidate matched to prefecture, but not to anything more precise.
S3	Single close match with the point located at postal code centroid. For Japan, S3 indicates that the candidate matched to prefecture, city, and municipality subdivision (such as chome, oaza).
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. For Japan, S4 indicates that the candidate matched to prefecture, city, municipality subdivision, and subarea, but not to anything more precise.See **Interpreting S Result Codes** on page 36
S5	Single close match with the point located at a street address position. For Japan, S5 indicates that the candidate matched block but the lot was not provided on input. The S5 code is followed by letters and dashes indicating match precision. For information about these letters, see **Interpreting S Result Codes** on page 36.
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 Japan, S7 indicates that the candidate matched block but the lot was not provided. In these cases, the block includes the building number so a lot number is not needed.

S Result Code	Description
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: • 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

Category	Description	Example
S	Street suffix direction S in result code is present if any of these conditions are satisfied: • 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
C	City name	South Brisbane
Z	Postal code	4101
A, G, or U	Database type used to obtain the match. • 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 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. Japan 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.
	For Japan, this indicates a prefecture (ken) match.
G2	County (district or region) centroid match.
	For Japan, this indicates a city (shi) match.
G3	City or town (municipality) centroid match.
	For Japan, this indicates a sub-city (oaza) match.
G4	Locality (village, suburb, or neighborhood) centroid match.
	For Japan, this indicates a city district (chome) 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.
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.

5 -
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 reverese 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

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: • 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 Japan

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: • Feet • Miles • Meters • Kilometers
Option.CoordinateSystem	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). Each country supports different coordinate systems. Depending on the country, you have one or more of the following options: **EPSG:4301** Also known as the Tokyo coordinate system. **EPSG:4326** Also known as the WGS84 coordinate system.

Matching Options

Table 15: Matching Options for Japan

Parameter	Description
Option.KeepMultimatch	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.
	If you select this option, specify the maximum number of candidates to return using the Option.MaxCandidates option (see below).
	Y Yes, return candidates when multiple candidates are found. Default.
	N No, do not return candidates. Addresses that result in multiple candidates will fail to geocode.
Option.SortCandidatesUsingLocale	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).
	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.
	Y Yes, candidates are sorted and returned based on input language.
	N No, candidates are returned in the order that the dictionary was added to the database, regardless of input language.

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 Japan

Parameter	Description
Option.DatabaseSearchOrder	The name of one or more database resources to use in the search process. Use the database name specified in the Management Console.
	You can specify multiple database resources. If you specify more than one database, list them in order of preference.
	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.
	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.

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.

Response Element	Description
City	The name.
	For Japan, the municipality subdivision (sub-city)
Data.County	The meaning of county varies by country.
	• JPN (Japan)—City (shi)
	The city (shi) name.
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 38.
HouseNumber	The lot number for the matched location.
	For Japan, this field contains the lot number.
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

Response Element	Description
Language	For reverse geocoded candidates, the two-character language code is returned.
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	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. • JPN (Japan)—City district (chome)
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 `MaxRanges` 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.

Response Element	Description
PrivateMailbox	This field is not currently used.
SegmentCode	A unique ID that identifies an individual address. In Japan, this is the Jusho code. A Jusho Code is a point ID that represents a unique address.
SegmentParity	Indicates which side of the street has odd numbers. **L** Left side of the street **R** Right side of the street **B** Both sides of the street **U** Undetermined
Data.StateProvince	The meaning of State/Province varies by country. • JPN (Japan)—Prefecture
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. In Japan, this contains the block. Japanese addresses typically do not have street names.
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.

Response Element	Description
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.

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