pitney bowes

Spectrum Technology Platform

Version 10.0

Geocoding Guide for Italy - REST

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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. or U.K. addresses. To geocode U.S. addresses, use GeocodeUSAddress. To geocode U.K. addresses, use GeocodeAddressGBR.

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, a GeocodeAddressGlobal will become available in the Management Console, Enterprise Designer, and Interactive Driver.

GeocodeAddressGlobal is an optional component of the Enterprise Geocoding Module.

In this section

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

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 Italy.

Table 1: Input Fields for Italy

Parameter	Description
Data.AddressLine1	One of the following: • The address line containing the street name and building number. For example: **belvedere aldo nardi 1** 00010 Sant'angelo Romano • This field can also contain the full address. For more information, see **Single Line Input** on page 6 • 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 7.
Data.AddressLine2	This field is not used in this country.
Data.City	The city or town name. Your input address should use the official city name or alias. For Argentina, Austria, Bahamas, Czech Republic, Indonesia, Italy, Mexico, Portugal, Spain, Slovenia, and Switzerland, you may use the town alias. Italian and German town

Parameter	Description
	name aliases are recognized. For example, Arécio is an alias for Arezzo. Likewise, Neumarkt is an alias for Egna.
Data.Country	The meaning of county varies by country. • ITA (Italy)—Province
Data.FirmName	A place name, such as a building name or company name.
Data.HouseNumber	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. **Note:** The house number specified in the HouseNumber field takes precedence over any house number specified in the AddressLine1 field.
Data.LastLine	The last line of the address. • belvedere aldo nardi 1 **00010 Sant'angelo Romano**
Data.Locality	The meaning of locality varies by country: • ITA (Italy)—Locality
Data.PostalCode	The postal code in the appropriate format for the country. Italy uses a five-digit postal code system. The first three numbers indicate the province and the last two numbers designate the delivery point.
Data.StateProvince	The meaning of State/Province varies by country. • ITA (Italy)—Region

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 Italy

Follow these guidelines to provide input that GeocodeAddressGlobal can successfully geocode. For additional information about the Italy postal system, see the Posteitaliane website: **www.poste.it**.

- **Required fields**—Addresses must contain either a city or a postal code.
- **German language addresses**—German address formats (common in the South Tyrol area of Italy) are handled and geocoded correctly. Typical German thoroughfare types and abbreviations are supported. For example, the street name Marienstraße could be abbreviated as Marienstr, and the same candidate is returned. Note that regardless of whether strasse or straße is entered as input, strasse is returned in the output candidate.
- **Aliases for regions, localities, and provinces**—Aliases can be used on input. For example, Tuscany is an alias for the region of Toscana. When you geocode, the returned candidate matches the user input. That is, if aliases were used then aliases are returned.
- **Regions and provinces**—For street geocoding, region names (which are entered in the StateProvince field) are not used for geocoding purposes, but are returned. Province abbreviations consisting of two letters are returned in the County field. Italy has 20 regions and 110 provinces.
- **PO boxes**—Post Office Box numbers are not used for address matching or geocoding purposes, but this does not interfere with matching or geocoding. The PO Box information is not returned. The following formats are recognized:

  Casella Postale
  CP

- **Thoroughfare types**—Thoroughfare types (pre and post thoroughfare types) and their common abbreviations are recognized and fully supported on input and output. Both Italian and German thoroughfare formats are supported.
- **Common words, abbreviations, and directionals**—The geocoder recognizes common words, directionals, house number indicators, and abbreviations used in addresses and can geocode these addresses successfully.
- **Numbers, numeric equivalents, and ordinals**—Numbered streets are mapped to the named equivalents. For example, if you enter the street name `Via 42 Martiri`, the street name `QUARANTADUE MARTIRI` is returned. Ordinals are also recognized in input addresses.

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 city or town.
- *Locality* is the locality name.
- *PostalCode* is the complete postcode. For Brazil,

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,

```
Via del Canneto,03011
```

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

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

Punctuation is ignored for geocoding purposes.

Guidelines for Single Line Input

- 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:

AddressLine1: `Via Balilla && Via Roma`
City: `Sant'Angelo Romano`

Note: The double ampersand (&&) can always be used as an 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

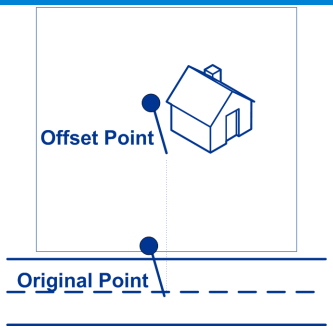
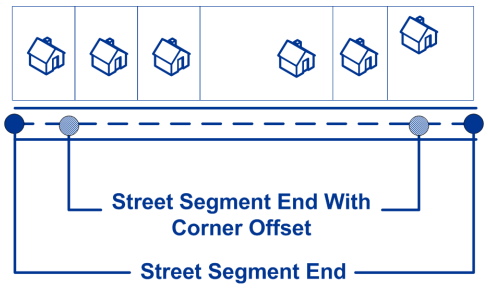
Geocoding Options

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

Table 2: Geocoding Options for Italy

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.

Parameter	Description
	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.
Option.FallbackToPostal	Specifies whether to attempt to determine a postal code centroid when an address-level geocode cannot be determined. **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.
Option.OffsetFromStreet	Indicates the offset distance from the street segments to use in street-level geocoding. The distance is specified in the units you specify in the 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.

Parameter	Description
	 Street coordinates are accurate to 1/10,000 of a degree and interpolated points are accurate to the millionths of a degree.
Option.OffsetFromCorner	Specifies the distance to offset the street end points in street-level matching. The distance is specified in the units you specify in the OffsetUnits option.This value is used to prevent addresses at street corners from being given the same geocode as the intersection. **Note:** Offset is not supported for the United Kingdom (GBR) or Japan (JPN). The default value varies by country: • 12 meters—Australia (AUS), Austria (AUT), Germany (DEU) • 7 meters—For other supported countries, the default offset is 7 meters. The following diagram compares the end points of a street to offset end points. 
Option.OffsetUnits	Specifies the unit of measurement for the street offset and corner offset options. One of the following: • Feet • Miles • Meters • Kilometers

Parameter	Description
	The default is Meters.
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:4230** Subset of WGS84. **EPSG:4326** Also known as the WGS84 coordinate system. **EPSG:27200** Also known as the NZGD49 coordinate system.
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. **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

Parameter	Description
	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 IntersectionStreet2.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.

Table 3: Matching Options for Italy

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 **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.

Parameter	Description
	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.
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 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 to specify the address elements you want. This is the default value for most countries.

Parameter	Description
	RelaxedMode All candidate addresses are considered a close match.
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	Specifies whether candidates must match the house number to be considered a close match. If you select this option you should also require an exact match on street name. This option does not significantly affect performance. It does, however, affect the type of match if the candidate address corresponds to a segment that does not contain any ranges. The type of match can also be affected when the house number range for a candidate does not contain the input house number. If you relax the house number, you should set the maximum ranges to be returned to a value higher than 0. **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.
Option.MustMatchStreet	Specifies whether candidates must match the street name to be considered a close match. 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. **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	• ITA (Italy)—Locality

Parameter	Description
	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 city to be considered a close match. For Japan, this field specifies whether the candidate must match the municipality subdivision (oaza). 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. • ITA (Italy)—Province 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.
Option.MustMatchStateProvince	Specifies whether candidates must match the state or province (or equivalent) to be considered a close match. • ITA (Italy)—Region 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

Parameter	Description
	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 4: Data Options for Italy

Parameter	Description
Option.Database	Specifies the database to be used for geocoding. Only databases that have been defined in the Databases Resources panel in the Management Console are available.
Option.DatabasePreference	Specifies which geocoding databases to use. One of the following: **PreferCustom** Use both standard databases and custom databases, but give preference to candidates from custom databases. Use this option if you feel your custom database is superior to the standard database. **PreferStandard** Use both standard databases and custom databases, but give preference to candidates from standard databases. **CustomOnly** Use only custom databases. Ignore standard databases. **StandardOnly** Use only standard databases. Ignore custom databases. **Both** Use both standard databases and custom databases. In cases where candidates are returned from both, the standard database is preferred. Default. 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's Database Resources tool. You can specify multiple database resources. If you specify more than one database, list them in order of preference.

Parameter	Description
	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.

Related Links

GeocodeAddressGlobal on page 3

Output Data Options

The following table lists the options that control which data is returned in the output.

Table 5: Output Data Options

Parameter	Description
Option.ReturnOnlySimilarFirmNames	This option applies to the U.K. only. Specifies whether to return firm names only when the input firm name is similar to the firm name in the geocoding database. For example, if the input firm name is "Pitney Bowes" but the geocoding database returns "Pitney Bowes Software, Inc.", these two firm names are not similar. In most cases the input firm name must match the firm name in the database exactly. Some differences in abbreviations are considered similar enough to result in the firm name being returned. **Y** Yes, return only firm names that are similar to the input firm name. **N** No, return firm names regardless of whether they are close to the input firm name. Default.

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.

Address Output

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

Table 6: Address Output for Italy

Response Element	Description
AddressLine1	First line of the address.
AddressLine2	Second line of the address.
ApartmentLabel	The type of unit, such as apartment, suite, or lot.
ApartmentNumber	Unit number.
City	The municipality name.
Country	The three-letter ISO 3166-1 Alpha 3 country code. For Italy, the country code is ITA. 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. **SMR (San Marino)**—Addresses from San Marino contain ITA (Italy) in the Country field. **VAT (Vatican City)**—Addresses from Vatican City contain ITA (Italy) in the Country field.
Data.Country	The meaning of county varies by country.

Response Element	Description
	• ITA (Italy)—Province
FirmName	Name of the company or a place name.
HouseNumber	The building number for the matched location.
HouseNumberHigh	The highest house number of the range in which the address resides.
HouseNumberLow	The lowest house number of the range in which the address resides.
HouseNumberParity	Indicates if the house number range contains even or odd numbers or both. **E** Even **O** Odd **B** Both **U** Unknown
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: • ITA (Italy)—Locality
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.
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 postcode for the address. The format of the postcode varies by country. Postcode data is not available for every country.
PostalCode.Addon	The second part of a postcode. This field is not used by most countries.
PreAddress	Miscellaneous information that appears before the street name.
PrivateMailbox	This field is not currently used.

Response Element	Description
Ranges	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.

Response Element	Description		
		-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, 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.		
	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. • ITA (Italy)—Region		
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 with the Database Resources tool.		
StreetName	For most countries, this contains the street name.		

Response Element	Description
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.
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 the **Return Parsed Address Geocoding Option** for more information.

Geocode Output

Table 7: Geocode Output for Italy

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.

Table 8: Result Code Output for Italy

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
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.

Response Element	Description	
	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.
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.

Response Element	Description
	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 with the Database Resources tool.

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, use ReverseGeocodeUSLocation.

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, a ReverseGeocodeAddressGlobal will become available in the Management Console, Enterprise Designer, and Interactive Driver.

In this section

Input

ReverseGeocodeAddressGlobal takes longitude and latitude as input.

Table 9: ReverseGeocodeGlobal Input

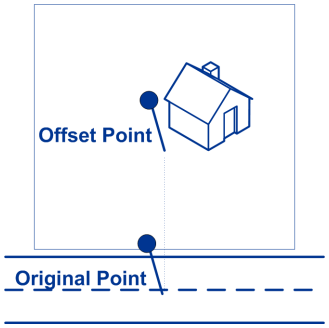
Parameter	Format	Description
Data.Latitude	String	The latitude of the point for which you want address information.
Data.Longitude	String	The longitude of the point for which you want address information.
Data.Country	String	One of the following: • The name of the country in English. • The two-character ISO 3116-1 alpha-2 country code. • The three-character ISO 3116-1 alpha-3 country code.

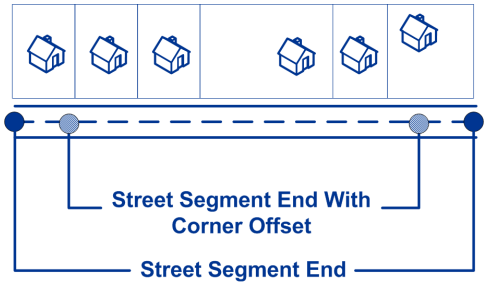
Options

Geocoding Options

Table 10: Geocoding Options for Italy

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

Parameter	Description
	• Miles • Meters • Kilometers
Option.OffsetFromStreet	Indicates the offset distance from the street segments to use in street-level geocoding. The distance is specified in the units you specify in the 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.
Option.OffsetFromCorner	Specifies the distance to offset the street end points in street-level matching. The distance is specified in the units you specify in the OffsetUnits option.This value is used to prevent addresses at street corners from being given the same geocode as the intersection. **Note:** Offset is not supported for the United Kingdom (GBR) or Japan (JPN).

Parameter	Description
	The default value varies by country: • 12 meters—Australia (AUS), Austria (AUT), Germany (DEU) • 7 meters—For other supported countries, the default offset is 7 meters. The following diagram compares the end points of a street to offset end points. 
Option.OffsetUnits	Specifies the unit of measurement for the street offset and corner offset options. One of the following: • Feet • Miles • Meters • Kilometers The default is Meters.
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:4230** Subset of WGS84. **EPSG:4326** Also known as the WGS84 coordinate system. **EPSG:27200** Also known as the NZGD49 coordinate system.

Matching Options

Table 11: Matching Options for Italy

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 12: Data Options for Italy

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's Database Resources tool. 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 13: Reverse Geocode Address Global Output Fields

Response Element	Description
AddressLine1	First line of the address.
AddressLine2	Second line of the address.
ApartmentLabel	The type of unit, such as apartment, suite, or lot.
ApartmentNumber	Unit number.
City	The municipality name.
Data.Country	The meaning of county varies by country. • ITA (Italy)—Province

Response Element	Description
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 39.
HouseNumber	The building number for the matched location.
HouseNumberHigh	The highest house number of the range in which the address resides.
HouseNumberLow	The lowest house number of the range in which the address resides.
HouseNumberParity	Indicates if the house number range contains even or odd numbers or both. **E** Even **O** Odd **B** Both **U** Unknown
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: • ITA (Italy)—Locality
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.
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 postcode 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.

Response Element	Description
PreAddress	Miscellaneous information that appears before the street name.
PrivateMailbox	This field is not currently used.
SegmentCode	A unique ID that identifies a street segment.
SegmentParity	Indicates which side of the street has odd numbers. **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. • ITA (Italy)—Region
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 with the Database Resources tool.
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.

3 - 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.

In this section

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 14: 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 37
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 37.
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: • 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: • 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

Category	Description	Example
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 15: 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. Italy can generate a Z1 result code. Country-specific geocoders can often generate more accurate postcode results (with Z2 or Z3 result codes).

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 on the accuracy of the candidate.

Table 16: 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.

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 17: 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.

Non-match Codes

The following result codes indicate no match was made:

- **N**—No close match.
- **NX**—No close match for street intersections.

- **ND**—Spectrum™ Technology Platform could not find the geocoding database for the given postal code or municipality/state/province.

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