



Location Intelligence

GeoStan™ Geocoding z/OS Suite

Spring 2019 Release

Technical Notes



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Introduction

The Spring 2019 release includes the following products and versions:

- Geographic Determination Library™ (GDL) z/OS 39.04
- GeoStan™ z/OS 32.00
- GeoStan FileServer 2.0
- Spatial+™ z/OS 39.04

Listed below is an overview of release documentation, regulatory information, release highlights, database compatibility, and platform changes for this release. With this release, we have rebranded the “Centrus Product Suite” to “GeoStan Geocoding Suite”. This change will be reflected on the Support site as well, see the updated link below.

Note: Although we will continue to provide Level 1 technical support for the Centrus Product Suite in its version as of the Spring 2018 release, any future product updates will only be provided for the GeoStan Geocoding Suite in its Spring 2019 release version.

Release Documentation

The technical notes and installation guides for the different Pitney Bowes Software products are available for download from the Pitney Bowes Support Web site at <https://www.pitneybowes.com/us/support/products/software/geostan-support.html>.

To access these documents, log into the Support site and select **Documentation**. Then, select **Technical Product Info** for the technical notes or **Installation Guides** for the installation documentation.

Regulatory Changes

The implementation date for CASS Cycle O has been deferred by the United States Postal Service® (USPS®) until August 1, 2021. The USPS Coding Accuracy Support System (CASS™) Cycle N will be valid through July 31, 2021. The USPS reserves the right to modify the “valid through” date in the future if conditions warrant it. The geocoder application shipped with GeoStan is CASS Certified for Cycle N in the Spring 2019 release version.

Highlights and General Enhancements

GeoStan 32.00

- **Added Master Location Data (MLD) Extended Attributes**
Extended Attributes are now available with MLD. This new feature provides access to extended attributes associated with an addressable location that has a pbKey. When matching addresses with MLD, you can now seamlessly return additional property information associated with the address, such as APN, Elevation, Address Type, Lot Size, etc. See [MLD Extended Attributes including APN and Elevation](#) below.
- **Added Residential Delivery Indicator (RDI™)**
This United States Postal Service (USPS®) data product identifies whether a delivery type is classified as residential or business. If you are shipping to residences, you may lower costs by shipping with the Postal Service™ and avoid residential delivery surcharges typically charged by other shipping companies. See [Residential Delivery Indicator \(RDI™\)](#) below.
- **Improvements to Singleline Address Matching**
Several enhancements to singleline matching; see [Singleline Matching Enhancements](#) below.

Product Updates

GeoStan 32.00

MLD Extended Attributes including APN and Elevation

Added Master Location Data (MLD) Extended Attributes

Extended Attributes are now available with MLD. This new feature provides access to extended attributes associated with an addressable location that has a pbKey. When matching addresses with MLD, you can now seamlessly return additional property information associated with the address, such as APN, Elevation, Address Type, Lot Size, etc. See the full list of fields detailed below.

Requirements

The following are required to access MLD Extended Attributes:

- Master Location Dataset (.gsd and .gsi files).
- Streets data set.
- MLD Extended Attributes data set (extatt*p.dld files).
- It is recommended that the vintages of the MLD and MLD Extended Attributes data sets be within 4 months of each other.

Implementation

This section explains how to implement MLD Extended Attributes in your application.

1. Upload MLD streets and MLD Extended Attribute datasets.
 - Install the MLD and streets data sets and their associated license files. Note the paths to these folders.
 - Install the MLD Extended Attributes data set. The MLD Extended Attributes data set needs to be unzipped and copied to a folder. Note the path to this folder.
2. Use DD EXTATTnn (where nn = 01 through 05) for each of the Extended Attribute files.
 - Define the data paths to DVDMLD, DVDMLD2 and the folder where you installed the MLD Extended Attributes data set, as well as any other geocoding data sets you have installed for your application. Define the paths to the associated license files and passwords.
 - The MLD Extended Attributes data is delivered in 5 separate .dld files, extatt*p.dld, where "*" is a number. When installed, GeoStan will automatically detect and load these files, and set the Status File MLD Extended Attributes property. When initializing GeoStan, you can optionally query the Status File MLD Extended Attributes property to confirm the extatt*p.dld files loaded successfully.

| | |
|--------------|----------------------------|
| COBOL | GS-STATUS-FILE-EXTEND-ATTR |
|--------------|----------------------------|

3. Process the match by calling the Find Properties function.

4. The following table describes how to return APN and elevation data when available.

APN & Elevation are returned using the existing enums. Elevation is returned in feet using the existing enum. Optionally, elevation data can now be returned in meters using the appropriate, new enum. The following table details the existing enums for returning APN & Elevation, with elevation in feet. The second enum for elevation provides the elevation in meters.

| | |
|--------------|---|
| COBOL | <p>For APN: Use GSDATGET to return GS-APN-ID.</p> <p>For elevation: Use GsDataGet to return GS-PARCEN-ELEVATION or GS-PARCEN-ELEVATION-METERS</p> |
|--------------|---|

MLD Extended Attributes

COBOL

| GeoStan enum COBOL | Width— includes null terminator | Description |
|-----------------------------------|--|--|
| GS-ADDRTYPE | 2 | Address Type regarding number of units: <ul style="list-style-type: none"> • S – Single unit • M – Multiple units • P – Post Office box • X – Unknown |
| GS-APN-ID | 46 | Assessor’s Parcel Number (APN). |
| GS-INC-IND | 2 | Incorporated Place Indicator. <ul style="list-style-type: none"> • I – Incorporated place • N – Not an incorporated place • X – Unknown |
| GS-LOTSIZE | 11 | Lot size of the parcel expressed in square feet; 0 if none. |
| GS-LOTSIZE-METERS | 11 | Lot size of the parcel expressed in square meters; 0 if none. |
| GS-MEC-LAT | 13 | Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. Example: 34809676 means 34.809676 |
| GS-MEC-LON | 13 | Longitude of Minimum Enclosing Circle expressed with implied 6 digits of decimal precision; 0 if none. Example: -92447089 means -92.447089. |
| GS-MEC-RAD | 12 | Radius of Minimum Enclosing Circle (in feet) expressed as a whole number. Example: 1234 means 1,234 feet. |
| GS-MEC-RAD-METERS | 12 | Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision; 0 if none. Example: 123.4 meters. |
| GS-PARCEN-ELEVATION | 7 | Elevation of the geocode at the parcel centroid in feet. |
| GS-PARCEN-ELEVATION-METERS | 7 | Elevation of the geocode at the parcel centroid in meters. |
| GS-RESBUS | 2 | Usage indicator <ul style="list-style-type: none"> • R – Residential use • B – Business use • M – Mixed use – residential and business • X – Unknown use |
| GS-TFID | 10 | TIGER Face Identifier. This field can be used to match to all Census |

| GeoStan enum COBOL | Width— includes null terminator | Description |
|-----------------------|--|---|
| | | geocodes using external data; 0 if none. |
| GS-PLACE | 8 | TIGER Place code; 0 if none. |
| GS-UACE | 6 | TIGER Urban Area Identifier. Defines the urban area if any; 0 if none. |
| GS-UACEPOP | 11 | Census population of the urban area; 0 if none. |
| GS-URBANICITY | 2 | Urbanicity Indicator. An indicator that defines per the Census the Urbanicity of the Address using TIGER UACE codes for categorization. <ul style="list-style-type: none"> • L – Large Urban Area (50,000 or greater population) • S – Small Urban Area (2,500-50,000 population) • R – Rural • X – Unknown |

Geocoder Updates

New File Status Values

If the MLD Extended Attributes data has been successfully loaded, the **Initialization Status** will return file status information on the 5 extatt*p.dld files – their file location and vintage. The **Files Loaded** information will also show “MLD Extended Attributes data: TRUE”.

Geocoder Output fields

Parcel Centroid Elevation

To retrieve the elevation in feet, use the existing output field:

| Field | Length (with null terminator) | Description |
|---------------------------|-------------------------------------|---|
| outParCenElevation | 7 | Elevation, in feet, at the parcel centroid. |

The new optional output field returns the elevation of the geocode at the parcel centroid in meters.

| Field | Length (with null terminator) | Description |
|---------------------------------|-------------------------------|---|
| outParCenElevationMeters | 7 | Elevation, in meters, at the parcel centroid. |

Additional Geocoder Output Fields

| Field | Length (with null terminator) | Description |
|-------------------------|----------------------------------|---|
| outAddrType | 2 | Address Type regarding number of units: <ul style="list-style-type: none"> • S – Single unit • M – Multiple units • P – Post Office box • X – Unknown |
| outAPNID | 46 | Assessor’s Parcel Number (APN) |
| outInclnd | 2 | Incorporated Place Indicator. <ul style="list-style-type: none"> • I – Incorporated place • N – Not an incorporated place • X – Unknown |
| outLotSize | 11 | Lot size of the parcel expressed in square feet; 0 if none. |
| outLotSizeMeters | 11 | Lot size of the parcel expressed in square meters; 0 if none. |
| outMeclat | 13 | Latitude of Minimum Enclosing Circle expressed with an implied 6 digits of decimal precision; 0 if none. Example: 34809676 means 34.809676 |
| outMeclon | 13 | Longitude of Minimum Enclosing Circle expressed with implied 6 digits of decimal precision; 0 if none. Example: -92447089 means -92.447089. |
| outMecRad | 12 | Radius of Minimum Enclosing Circle (in feet) expressed as a whole number. Example: 1234 means 1,234 feet. |
| outMecRadMeters | 12 | Radius of Minimum Enclosing Circle (in meters) expressed with 1 digit of decimal precision; 0 if none. Example: 123.4 meters. |
| outPlace | 8 | TIGER Place code; 0 if none. |
| outResBus | 2 | Usage indicator <ul style="list-style-type: none"> • R – Residential use • B – Business use • M – Mixed use – residential and business • X – Unknown use |
| outTFID | 10 | TIGER Face Identifier. This field can be used to match to all Census geocodes using external data; 0 if none. |
| outUACE | 6 | TIGER Urban Area Identifier. Defines the urban area if any; 0 if none. |
| outUACEPop | 11 | Census population of the urban area; 0 if none. |
| outUrbanicity | 2 | Urbanicity Indicator. An indicator that defines per the Census the Urbanicity of the Address using TIGER UACE codes for categorization. <ul style="list-style-type: none"> • L – Large Urban Area (50,000 or greater population) • S – Small Urban Area (2,500-50,000 population) • R – Rural • X – Unknown |

Residential Delivery Indicator (RDI™)

The Residential Delivery Indicator (RDI™) is a United States Postal Service (USPS®) data product that identifies whether a delivery type is classified as residential or business. If you are shipping to residences, you may lower costs by shipping with the Postal Service™ and avoid residential delivery surcharges typically charged by other shipping companies.

Added a new enumerator (enum) and output status properties to support RDI.

Note: To use RDI, Delivery Point Validation (DPV) must also be initialized.

New Init Property

Opens the USPS RDI file (rdi.db) needed to return a value for the Residential Delivery Indicator; maximum of 255 characters. Requires Delivery Point Validation (DPV).

| |
|---|
| COBOL GS-INIT-RDI-DIRECTORY |
|---|

New Status RDI File Property

The new file status confirms the USPS RDI data (rdi.db) has loaded. Boolean. True = file loaded successfully. Default = False.

| |
|--|
| COBOL GS-STATUS-RDI-FILE-ALL |
|--|

New RDI output enum

USPS Residential Delivery Indicator (requires DPV-confirmed ZIP+4)

Y= Residence, N = Business, Blank = Address was not presented to RDI or RDI data not loaded.

| |
|------------------------------------|
| COBOL GS-RDI-RETCODE |
|------------------------------------|

Syntax

RDI_DATAPATH = path/<file>

Type

String of path and file name.

Implementation

1. Upload the rdi.db
2. Use DD RDIDB for the rdi.db
3. Set the GS-INIT-RDI-DIRECTORY init property to the directory containing the USPS RDI data (rdi.db).
Note: maximum of 255 characters.
4. Verify the GS-STATUS-RDI-FILE_ALL property is "True". This indicates the RDI data loaded successfully.
5. Process the addresses.
6. Values are returned in the GeoStan output field GS-RDI-RETCODE.
 - Y – address is a residence
 - N – address is a business
 - Blank – address was not presented to RDI or RDI data not loaded

Added output field (optional) for RDI

To retrieve the indicator, use this GeoStan output field:

| Output Fields | Data Type N-Numeric C-char string | Width-includes null terminator | Number of decimals if numeric | Description |
|---------------|---|-----------------------------------|-------------------------------------|--|
| RDIREtCode | C | 2 | 0 | USPS Residential Delivery Indicator (RDI) return code description: <ul style="list-style-type: none">• Y = Residence• N = Business• Blank = Not processed through RDI. |

Geocoder Changes

Added keywords to support Residential Delivery Indicator (RDI)

When using keywords in the Geocoder format file, remember:

- Keywords are not case sensitive.
- Lines that begin with open brackets ([) or semicolons (;) are comment lines
- The application ignores blank lines.
- Do not put quotation marks around strings.

| Keyword | Description |
|---------------|---|
| outRDIREtCode | USPS Residential Delivery Indicator (requires DPV-confirmed ZIP+4) <ul style="list-style-type: none">• Y - Address is a residence• N - Address is a business• Blank - Address was not presented to RDI or RDI data not loaded |
| RDIDirectory | Set this to "X" as an indicator to use RDI on z/OS. |

Singleline Matching Enhancements

Several improvements were made to singleline matching:

| Description |
|---|
| <p>Improved singleline matching for PO Boxes when entered as POST OFFICE BOX, or when the number is preceded by #.</p> <p>Improvements have been made in handling of street names that could also be city names in singleline address processing. For example:</p> <p>Input address: BOX 58 ASHAWAY RI 02804 Previous match: 58 ASHAWAY RD, 02804 New match: BOX 58, ASHAWAY RI 02804</p> |
| <p>Input address: BARCLAY PLZ APT 68G NEW WINDSOR NY 12553 Previous match: 68G NEW ST, NEW WINDSOR, NY 12553 New match: 68G BARCLAY PLZ, NEW WINDSOR, NY 12553</p> |
| <p>Enhancements have been made in singleline POI matching to recognize one or more embedded POIs. For example:</p> <p>Input address: FIRST SHORE FEDERAL SAVINGS & LOAN W GREEN ST & PEARL ST SNOW HILL Result: FIRST SHORE FEDERAL SAVINGS & LOAN, SNOW HILL MD 21863</p> |
| <p>Improved standard singleline addr2 handling. For example:</p> <p>Input address: MARVIN R BECK PT 1108 E PATTERSON/ POB 160 KIRKSVILLE MO 63501 Previous match: PO BOX 160 New match: 1108 E PATTERSON ST</p> |
| <p>Improved handling of singleline input addresses with missing or out of range house numbers. Matches and non-matches are now returned more accurately.</p> |
| <p>Improved handling and reporting of singleline matching of addresses containing multiple intersections when using Master Location Data. For example: 8th & laurel & 9th 21851.</p> |
| <p>Enhancements have been made in POI matching for the following cases:</p> <ul style="list-style-type: none">• Singleline input address containing a POI that ends with a city name that matches a given ZIP Code. For example: CHARTER HOSP OF DENVER 80228• Singleline input address containing a POI that ends with a state name that matches a given ZIP Code. For example: BANK OF COLORADO 80720• Two-line or singleline input address containing a POI that ends with a number. For example: KBIQ 102 7 80920 |

Matching Enhancements

Additional improvements were made to matching:

Description

Improved handling and matching of PO Box addresses that contain a “#” sign in front of the box number; for example, PO BOX #14.

New GS_IS_ALIAS return values:

- “A13” is returned when a match is made to ZIPMove data.
- “A14” is returned when a match is made to the expanded centroid file us_cent.gsc (file contained in the Master Location Structure Centroid data set).

Fixed Change Requests

The list below represents the change requests and software defects addressed in this release of GeoStan Geocoding z/OS. Please review this list carefully to determine whether the following corrections apply to your situation.

| Item Number | Change Request | Description |
|----------------------|------------------|--|
| CENTRUS-11334 | | File Server can now handle up to 220 files such as MLD, Extended Attribute, and Reverse PBK files. |
| CENTRUS-10630 | | Fixed an issue where an input address with a post-directional resulted in incorrect multi-match returns. |
| CENTRUS-10758 | Case 14964838 | Corrected inconsistent results for an address by modifying the way USPS Preferred aliases are returned outside of the CASS match mode. |
| CENTRUS-11004 | | Improved handling of input addresses containing underscores; for example, __4750 Walnut St. 80301 |
| CENTRUS-11005 | | Improved handling and matching of PO Box addresses that contain a “#” sign in front of the box number; for example, PO BOX #14. |
| CENTRUS-11030 | Case 17993814 | Fixed an issue where an input address containing multiple, single alpha characters and spaces was returning a segmentation fault error. 1 BOX T T #A now matches. |
| CENTRUS-11031 | Case 17999041 | Fixed an issue where an input address containing an intersection in the address line resulted in a multi-match which caused a crash. W Elkhorn Ave & S Monterey Ave., Cantua Creek, CA 93608 now processes correctly and returns match information. |
| CENTRUS-11032 | | Corrected an issue where multiple “NADCON files not found” error messages were returned when the files were not installed. |
| CENTRUS-11130 | | Fixed an issue where a system error was returned when only the “Return ZIP Code centroids” Centroid preference was selected, and no input ZIP was included when using 2-line address input. Now a non-match is returned instead. |
| CENTRUS-11100 | Case 18929830 | <p>Corrected an issue where the output ZIP was not being corrected on a matched address, if the input ZIP was invalid or missing and the Prefer Zip Over City option was being used.</p> <p>Example: Incorrect ZIP</p> <pre> Before Address CITY State POSTCODE outMatchCode outLocCode outCityPref outState outZip outZIP3 107 PRESTON RD Cheektowaga NY H2N1Y S800 AS0 BUFFALO NY H2N1Y 3626 After Address CITY State POSTCODE outMatchCode outLocCode outCityPref outState outZip outZIP4 107 PRESTON RD Cheektowaga NY 14033 S800 AS0 BUFFALO NY 14033 3626 </pre> <p>Example: Missing Zip</p> <pre> Before Address CITY State POSTCODE outMatchCode outLocCode outCityPref outState outZip outZIP4 8649 11TH AVE SILVER SPRING MD 0 S800 AS0 SILVER SPRING MD 00000 3203 After Address CITY State POSTCODE outMatchCode outLocCode outCityPref outState outZip outZIP4 8649 11TH AVE SILVER SPRING MD 20903 S900 AP02 SILVER SPRING MD 20903 3203 </pre> |
| CENTRUS-11341 | Case 20071807 | When doing last line geocoding and “Correct Lastline” is on, the Pref City now returns correctly. Example: Denver CO 80223 returns as Denver, not Aurora. |
| CENTRUS-10996 | Case 17733972 | Fixed a stack overflow crash encountered using DPV and LACSLink data in CASS match mode. |

Known Issues

- To support DPV processing with point data, in addition to enabling the `GS_FIND_DPV` property, a new Find property must be set. The new `GS_FIND_ENABLE_CLASSIC_SORT` property sets the sort order to prioritize parcel centroids over other centroids. Setting this property restores the previous behavior to produce the expected DPV confirmation results for records that should DPV confirm. Default = False.

| |
|--|
| COBOL GS- FIND- ENABLE- CLASSI C- SORT |
|--|

- If you wish to create and use multi-volume data sets with a version of IBM Language Environment prior to 1.8, you must install IBM APAR PK05959.
- If using DPV, LACSLink, and SuiteLink data, we do not recommend limiting the memory being used by GeoStan. Because of the size of these files, we recommend that GeoStan operate on a dedicated server, so that the maximum amount of memory is available for processing.
- When using auxiliary files, if House Number Parity, Side of Street, and Segment Direction contain erroneous input values, the following behavior occurs:
 - **House Number Parity** - GeoStan rejects the record as invalid.
 - **Side of Street** - GeoStan accepts the record and uses the centerline of the street as the address location.
 - **Segment Direction** - GeoStan accepts the record but changes the value to F (forward).

NOTE: If the value is left blank, GeoStan uses the default value.

- Due to limitations with the Windows platform, the geocoder.exe sample application cannot support output files over 2 GB.

Database Compatibility

NOTE: There are no data format changes to the street and point data sets for this release.

Platform-Specific Changes

Minimum Supported Levels of IBM Mainframe Systems

- z\OS – 2.1
- z\OS Transaction Server (CICS) – 5.2

For Further Assistance

If you have any questions about this release, please refer to the contact information on our website:

<https://www.pitneybowes.com/us/contact-dcs.html>

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