AFD Common API

Unified Access to AFD Address Management Solutions

Desktop Integration Guide

2023

Table of Contents

1. Introduction

The AFD Common API provides full access to the AFD API for all our products. The API is easy to use and quick to implement, while balancing that with providing full flexibility. This enables you to rapidly develop using the API with practically any development environment to provide the data that you require. All AFD products provide rapid lookup and search functionality allowing you to implement address management solutions and provide bank data, account, and card validation.

Our address management products are fully interchangeable with the Common API, meaning that you can include the name and all address fields in your integration even if you are only using our lowest level Postcode product. Your integration will then function fully with our Postcode Plus or Names & Numbers product should you, or your customer, wish to upgrade in the future. Similarly, if you only develop for one product now, it's easy to add fields and features from another later without having to learn a whole new API.

To make life as easy as possible, the AFD Common API comes with a Wizard which will generate sample projects and code for the major development environments, and we are adding more each quarter. The AFD Common API is also backed up by our free customer support services. You can visit our website at www.afd.co.uk/support for full developer support with using our API.

2. Getting Started

We recommend that for the most rapid development and to help you know where to start that you use our API Wizard to generate a sample project for your development environment. If your environment is not one that is listed, then select one that is closest to your own and use that as a basis for your coding. By looking at a sample project you can get a look and feel for how the API works and what you can do with it, and you can easily copy and paste the code from that into your own and adapt it to meet your needs. Our sample projects work in the way that your own application is most likely to work, but also keep code to an absolute minimum, whilst being well commented, so that you can transfer the code with ease. The API Wizard also provides the code to go into a module or class in your application with all our API declarations and constants included which you can copy and paste into your own application. The code for lookup and search functionality is also provided and can be similarly copied and pasted.

3. Using the API Wizard

To load the Wizard, look for the AFD Common API Item on your start menu, under which you will find the API Wizard shortcut.

3.1. Selecting your product and environment

The first step in the Wizard allows you to select the type of AFD product you will be integrating with and the development environment that you are using. The AFD product types are as follows:

3.1.1. Address Management

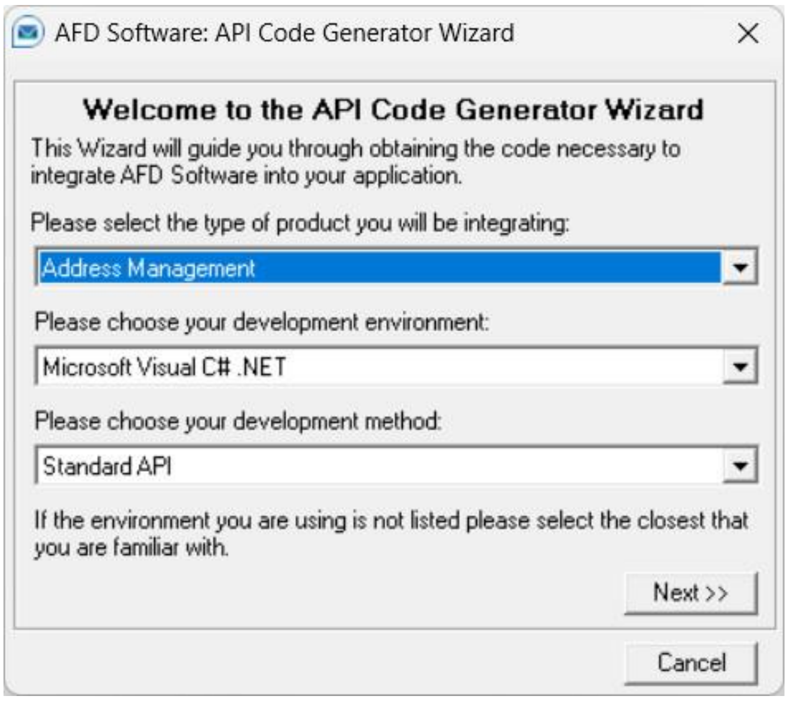
This includes AFD Postcode, Plotter, Postcode Plus, Names & Numbers, TraceMaster, ZipAddress and WorldAddress. Functionality is also included for AFD Refiner which can be used to clean addresses if you have a Refiner API license. The same code generated can be used with any one or all of these products. You should select this option if you are looking for address management functionality – i.e., being able to lookup and search for addresses.

3.1.2. BankFinder

This is for integrations using our AFD BankFinder product. If you have BankFinder and wish to integrate this for looking up or searching for Bank details, validating account or card numbers then this is the option you will require.

3.1.3. Nearest

This is for integrations for our AFD Nearest feature. This is available with all our address management products which contain grid references (i.e., AFD Plotter, Postcode Plus, Names & Numbers and TraceMaster). This allows you to utilise our Nearest feature to connect to your database of stores or customers to enable the nearest to be found by looking up a postcode, locality, or town.


AFD Software: API Code Generator Wizard

Welcome to the API Code Generator Wizard

This Wizard will guide you through obtaining the code necessary to integrate AFD Software into your application.

Please select the type of product you will be integrating: Address Management

Please choose your development environment: Microsoft Visual C# .NET

Please choose your development method: Standard API

If the environment you are using is not listed please select the closest that you are familiar with.

You can choose any of the following environments to integrate with. If the environment you require is not listed, then please select that closest to your own to base your integration on. You should note that we are continually adding environments, so if you have one that you would like to see added, or are having problems integrating with, please contact our support team (www.afd.co.uk/support) for assistance.

For some environments you will also be given the option as to which type of integration you require. The options are as follows:

3.1.4. Standard API

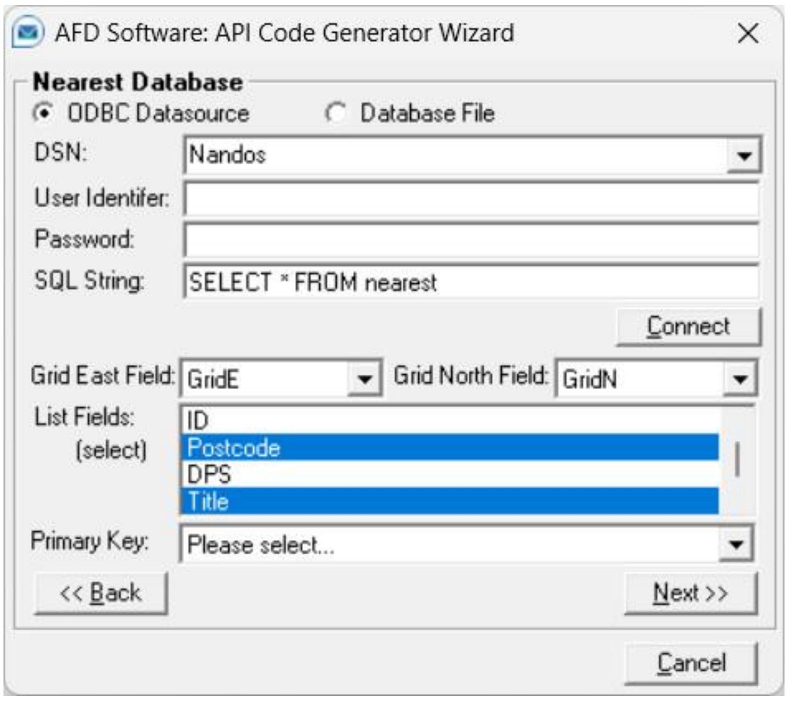
This is the most commonly used option and is used when the application is talking to our software directly on the local machine. This can be used with either desktop applications or client/server applications as long as the server used is the same one that our software is running on, and you have the appropriate server license if applicable. This is the most direct method for calling our API.

3.1.5. Postcode Everywhere XML API

Our XML API is perfect for server-based integrations where either the language makes XML a more desirable delivery mechanism or in some cases, such as Java, is the only suitable mechanism. It is also ideal where you wish to have the AFD product running through PostcodeEverywhere (our XML Server) on a different machine to that which is running your application, or you wish to use our own hosted or Postcode Internet Online per-click service. If you do not want to install the AFD software locally on a machine but wish to access it over the network through XML then again, this solution is ideal. You will need to have a server license and have PostcodeEverywhere installed to use this functionality.

3.2. Nearest Database - Nearest only

If you are integrating Nearest, the next stage of the Wizard will prompt you to select the database and specify the grid reference fields that you wish to connect to using the Common API. You can either connect using a DSN to an ODBC database source or use the Database File option to choose an Access, FoxPro or Paradox table to use instead.


AFD Software: API Code Generator Wizard

Nearest Database
(●) ODBC Datasource ( ) Database File
DSN: Nandos
User Identifer:
Password:
SQL String: SELECT * FROM nearest
Grid East Field: GridE
Grid North Field: GridN
List Fields: (select) ID, Postcode, DPS, Title
Primary Key: Please select...

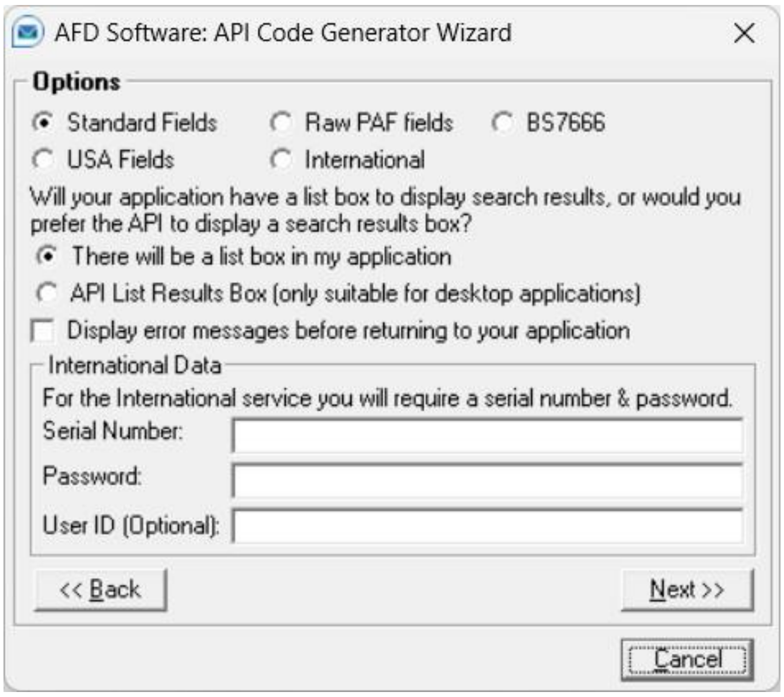
After specifying your database settings, you should click the Connect button where the Wizard will attempt to connect to your database. When successful it will update the fields displayed below. For Nearest to work correctly you need to ensure the correct grid easting and northing fields are selected. These should be on the OS GB grid system. If you need to add grid reference fields to your database and populate it, then please do this prior to running the Wizard and use the product front-end or AFD Refiner to add the grids to your database.

The Common API includes a List field to generate a string to display in a list of results for the user to select from. You should therefore select the fields from here that you wish to display in this List. We would recommend that either the Miles or Km field is included to provide the distance and then any other fields from your database that you desire. Alternatively, you may decide to generate this yourself as all fields will be returned from Nearest or may not be using a list, but it may still be worth checking these to use for testing purposes.

A Primary Key field is also required to re-retrieve a record when selected from the list.

3.3. API Options

The next stage of the Wizard presents you some options related to how you wish the API to work with your application. Not all the options presented here are available with all product types and development types. Where an option does not appear, it is not applicable in your case.


AFD Software: API Code Generator Wizard

Options

[✓ Standard Fields] Raw PAF fields BS7666
USA Fields International

Will your application have a list box to display search results, or would you prefer the API to display a search results box?

[✓ There will be a list box in my application]
API List Results Box (only suitable for desktop applications)

Display error messages before returning to your application

International Data

For the International service you will require a serial number & password.

Serial Number:

Password:

User ID (Optional):

3.3.1. Field Types

This allows you to select the format in which you require the address to be returned. Most developers will require the default Standard Fields option as this presents the address in the format most often used in labels and when writing an address. The Raw PAF fields provide the address in a raw format with, for example, the house number and building details separate. This can be useful for those capturing addresses for a database which stores addresses in this form. The BS7666 option provides addresses in the proposed BS 7666-5:2006 standard for a postal gazetteer allowing you to store addresses that conform to that standard (For more details on how our fields can be used to provide addresses in this standard, and other required meta data please see Appendix G of this manual). The USA Fields option is primarily intended for ZipAddress customers but note that regardless of the format you use, UK, USA, and International addresses will be returned in that format.

For address management products you can also select the International fields option which is recommended if you are using International data as it provides not only the component address fields for international address data but also provides the address formatted for correct addressing and label printing, so you are not left to try and format these for different countries yourself.

Note that BankFinder does not provide the proposed BS 7666-5:2006 format as it is not strictly applicable to that product which is not providing an address gazetteer.

3.3.2. List Box

Lookups and Searches can often produce multiple results from which the user will have to select the correct address or bank. The only time you do not have to worry about a list box is if you are solely going to validate account or card details in BankFinder without wishing to lookup branch details, even simple postcode lookups in our AFD Postcode product can sometimes yield multiple results as some postcodes contain more than one street.

Most developers will wish to include a list box on their form for this purpose and retain full control over layout, positioning and its look and feel. However, the option is also provided to use a list box provided by the API. The advantage of this is that if you wish to add a button, for example to lookup the address to an existing application and be able to fill in the whole address without having to accommodate a list box or redesign an existing screen layout this can easily be achieved. It also makes the API simpler to integrate as you don't have to worry about the facility to cancel long searches manage multiple results etc. – this is all done for you. Our example project and generated code make all this easy and should you opt to use the API's own internal list box now it's easy to change to use your own later by comparing the code. The internal list box will only be displayed when more than one result is returned for the user to choose from, or in the case of a long search so that the user is able to cancel it.

You should be aware that the API list box is only suitable for desktop applications that run on the same machine and desktop as the API as it will need to pop-up a window on the machine. Server applications will need to include their own list box and as such this option is not available when using XML solutions.

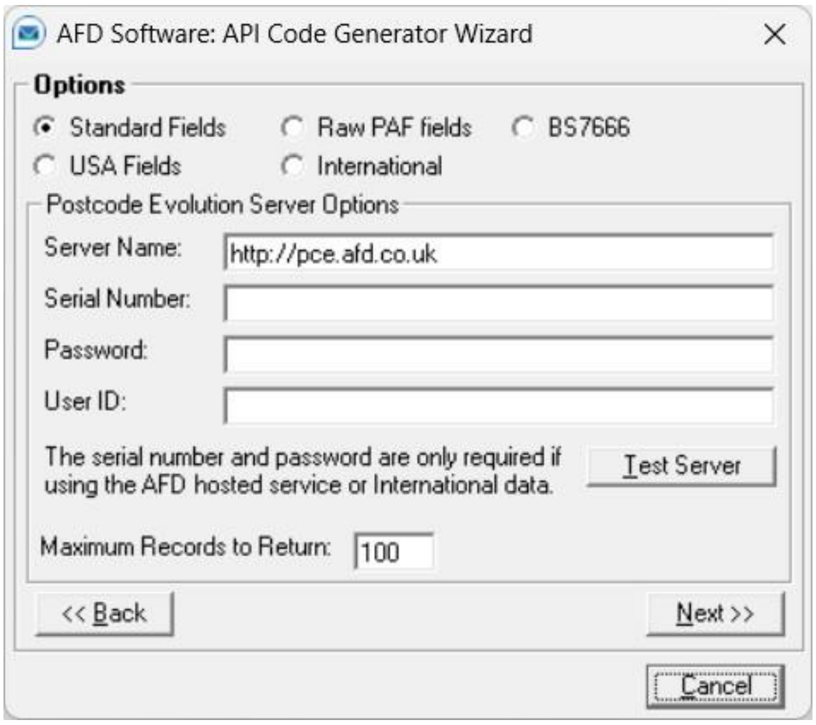
3.3.3. Displaying Error Messages

The facility to display error messages before returning to your own application is also included. This is most commonly used in conjunction with the facility to display the list box for you and means that in cases where an error occurs, such as no records found from a lookup, or an error opening the data files etc. this will be displayed to the user for you. The API Wizard includes the function to convert an error code to a string in the code generated for you, so displaying this yourself is easy, but if you'd like it done for you the option is there. Again, this is only applicable to desktop applications.

3.3.4. International Service Authentication Options

When calling the Common API through the standard DLL (not using a Postcode Everywhere server) you can still make use of International data if you have signed up to our International Service. This is done by the DLL passing lookups and searches where a non-UK country has been supplied to our server. To do this you will need to supply the serial number and password you were issued with for this service. You can also optionally include a userid which will identify this application.

3.3.5. Postcode Everywhere Server Options


AFD Software: API Code Generator Wizard

Options

[✓ Standard Fields] Raw PAF fields BS7666
USA Fields International

Postcode Evolution Server Options

Server Name: http://pce.afd.co.uk
Serial Number:
Password:
User ID:

The serial number and password are only required if using the AFD hosted service or International data.

Maximum Records to Return: 100

When using the PostcodeEverywhere XML method of integration you will also be given a number of options required to connect to the PostcodeEverywhere server. These are not all required in all cases:

Server Name: If you are using our hosted service there is no need to change this setting. If you have your own server you will need to enter its name (as it will be accessible from your client machines) and include any port if not port 80, e.g., http://myserver:81

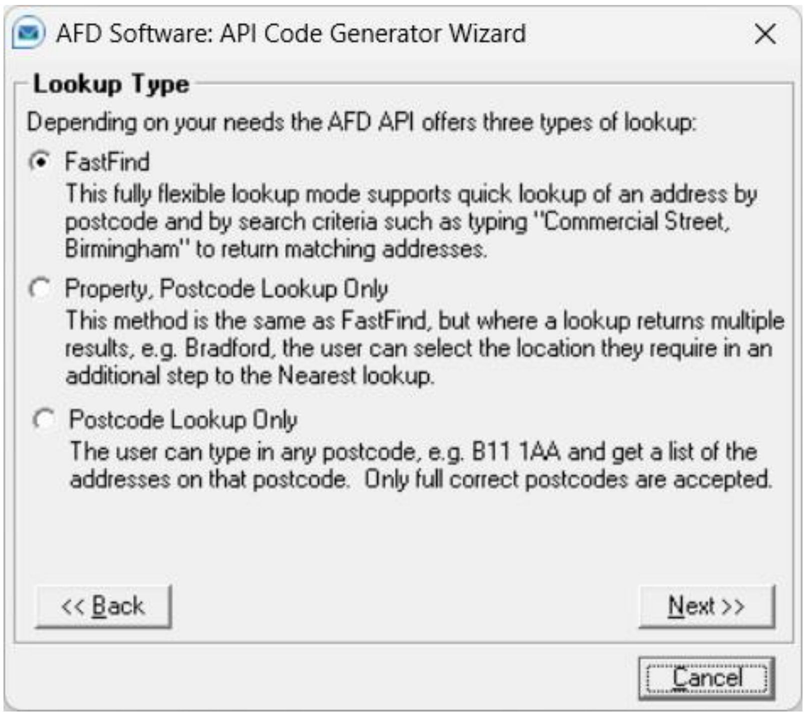
Serial Number: This is only required if you are using our hosted service (pce.afd.co.uk) or requiring International data (which must be passed to our server even if you are using your own for UK data). It is the serial number you were given on your license certificate when you purchased your license to use the service.

Password: Again, this is only required if you are using our hosted service or International service and you should be aware of what this is if you have purchased a license for it.

User ID: This field is optional and allows you to identify the user or application that uses the service. For example, you could use myapp to identify this application and myapp2 to identify another which could be helpful if you are reviewing logs later. Alternatively, you could alter the sample code to modify this based on the user using your software.

3.4. Lookup Type – Address Management / Nearest Only

The final option enables you to select the type of lookup that you require. It is easy to change this option in your code later as these are defined as constants. Please note that even if you take the option to only allow Postcode lookup's, full code is still provided for searching by specific address fields, so it is still possible to search for addresses when you don't know the Postcode.



AFD Software: API Code Generator Wizard

Lookup Type

Depending on your needs the AFD API offers three types of lookup:

[● FastFind]
This fully flexible lookup mode supports quick lookup of an address by postcode and by search criteria such as typing "Commercial Street, Birmingham" to return matching addresses.

○ Property, Postcode Lookup Only
This method is the same as FastFind, but where a lookup returns multiple results, e.g. Bradford, the user can select the location they require in an additional step to the Nearest lookup.

○ Postcode Lookup Only
The user can type in any postcode, e.g. B11 1AA and get a list of the addresses on that postcode. Only full correct postcodes are accepted.

The lookup options are as follows:

3.4.1. FastFind

This fully functional lookup mode allows the user the option to not only be able to enter a postcode in the lookup field, but also full find string's, such as with address management products entering "Commercial Street, Birmingham" to find all records matching that string. In the case of Nearest a locality and/or town string can be entered. This includes looking up addresses from partial postcodes and attempts to fix common typing errors in postcodes entered. This mode provides the most functionality and provides rapid searching from the lookup field. With Address Management products it's downside is that some lookup's can take some time, particularly with Names & Numbers due to the quantity of data, and so while lookup's can be canceled, in some cases you may prefer to restrict lookup's further.

3.4.2. Property, Postcode Lookup Only – Address Management

This mode enables you to lookup an address from its postcode (or zipcode), or by optionally including a property number, name, or organisation name to narrow the lookup down (e.g., 304, B11 1AA). In AFD Postcode Plus, Names & Numbers,TraceMaster and ZipAddress this will only return addresses matching the property specified. AFD Postcode and Plotter do not contain property data, however in this mode any number supplied will be returned with the address.

3.4.3. FastFind with Multiple Location Support – Nearest

This method is the same as FastFind, but where a lookup for a locality or town results in multiple matches the user will be presented with a list of locations to choose from. When they select the one they want, another lookup is carried out to find the nearest to the selected location.

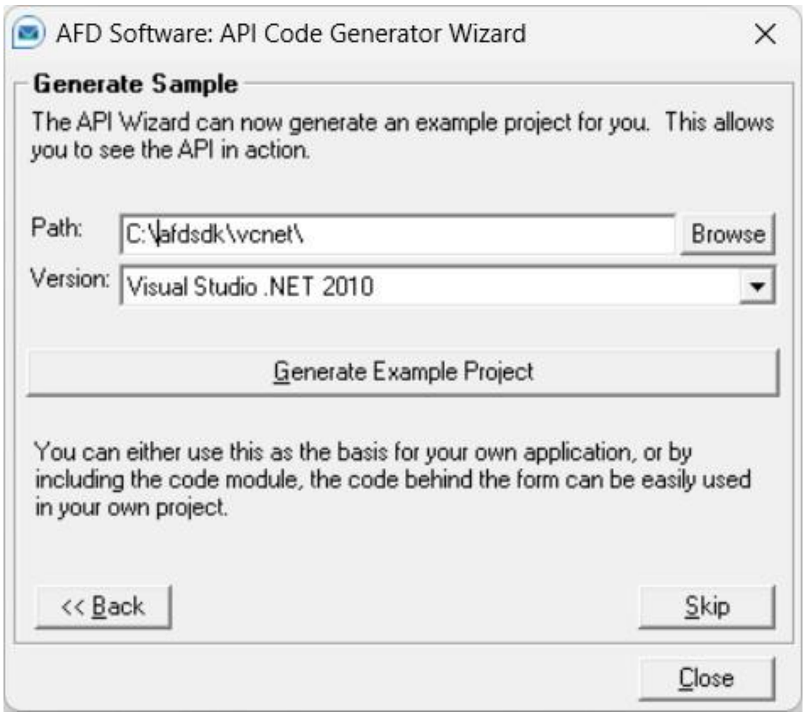
3.4.4. Postcode Lookup Only

This mode provides straight forward postcode (or zipcode) lookup functionality. The user can enter a full postcode (or zipcode) only and will get back a list of results on that postcode to select the address from (or in the case of Nearest will get the Nearest results to that postcode).

3.5. Generate Sample

This is not applicable to a few development environments – please skip to section 3.5 if this is not displayed.

The next stage enables you to generate an example project which contains all the code to carry out lookups and searches using your chosen product type and environment. You can use this to help get an idea as to how the integration works to decide how best to integrate your AFD product in your own application. If you are creating a new application, you can use the example generated as a starting point for your own. Alternatively, you can also easily include the code module or class included in the project in your own application and copy and paste code from the lookup and search buttons (and list box if applicable) into your own application.


AFD Software: API Code Generator Wizard

Generate Sample

The API Wizard can now generate an example project for you. This allows you to see the API in action.

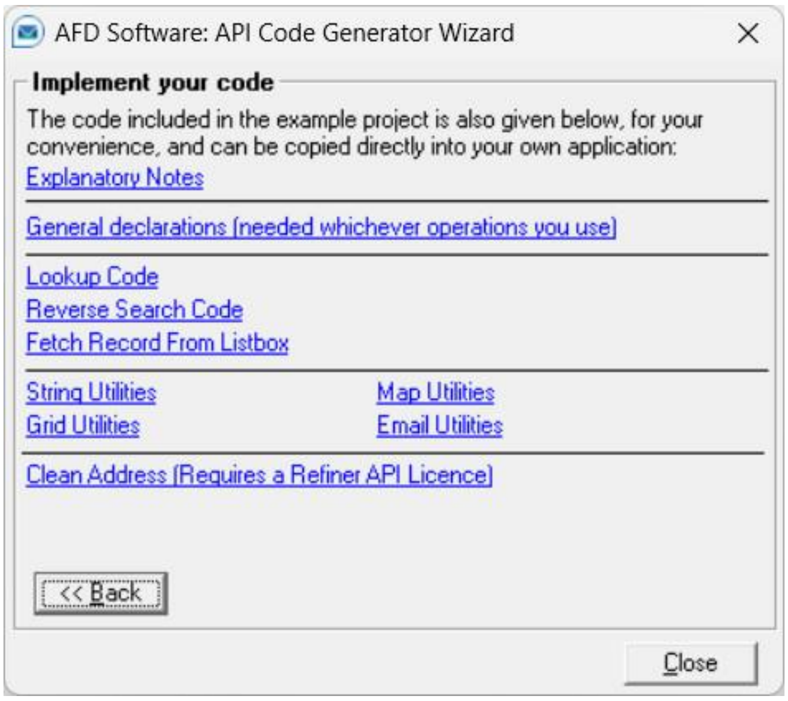
Path: C:\afdsdk\vcnet\

Version: Visual Studio .NET 2010

You can either use this as the basis for your own application, or by including the code module, the code behind the form can be easily used in your own project.

3.6. Implement Your Code

Finally, you are given clickable links which will open a window from which you can copy and paste code into your own application. This is as an alternative from obtaining it from the example generated. You will always need to include the General declarations in a code module, or class as described (C++ environments have both a header (.h) and code (.cpp) file to include). You can then copy and paste the Lookup and Search code as desired.


AFD Software: API Code Generator Wizard

Implement your code

The code included in the example project is also given below, for your convenience, and can be copied directly into your own application:

Explanatory Notes

General declarations (needed whichever operations you use)

Lookup Code
Reverse Search Code
Fetch Record From Listbox

String Utilities
Grid Utilities
Map Utilities
Email Utilities

Clean Address (Requires a Refiner API Licence)

3.7. Where To Go From Here

Now that you have your sample project, if applicable, and sample code you can customize the integration as desired. The sample projects are based around a form, using a list box – but you can of course change this to output results to a file, a database etc. if desired. Should you wish to alter the settings that you have chosen you can re-run the Wizard and the comments provided in the code and module make it easy to customise the integration to suit your needs. The rest of this document describes the functionality in more detail should you require this to help understand how the integration is working or wish to customise any aspect of it.

If you have a Refiner API license and wish to clean addresses, you can easily see this too in the sample project. First add a new button next to the "Search" button. On the final "Implement Your Code" window select the "Clean Address" link and copy and paste the code into the Click event for that button. You can then enter an address to clean on the left and see the resulting cleaned address on the right.

4. The Code Explained (Standard API)

Note: Please see Section 5 if you are using the PostcodeEverywhere XML functionality for an explanation of that.

4.1. General Declarations

4.1.1. Type or Structure

All code calling the Common API will need to include a module, class, or header and cpp file (depending on the environment) which includes the declarations required to use the AFD Common API. This file can be included in any project and contains all you need to easily use the full functionality of the API in accordance with your needs.

This code will start with a type or structure declaration which contains all the fields for the product type that you are integrating. This will take account of options you may have selected, for example the address format. By providing all available fields you can easily see the data which may be available and take advantage of it. You should always note that not all fields may return data for all underlying products and not all fields are searchable. For a list of the fields available in each product and to find out which ones are searchable please refer to the appropriate appendix:

Appendix A – Address Management Fields
Appendix B – BankFinder Fields
Appendix C – Nearest Fields

While we would recommend that you keep all fields present, should you wish to thin this out, you can remove any unwanted fields, as long as you also remove them from the field specification string described below.

VB Type returning only basic Address fields and fields necessary for lookup and result retrieval:

```
Type afdAddressData
  Lookup As String * 255
  Name As String * 120
  Organisation As String * 120
  Property As String * 120
  Street As String * 120
  Locality As String * 70
  Town As String * 30
  Postcode As String * 10
  PostcodeFrom As String * 8
  Key As String * 255
  List As String * 512
End Type
```

C++ Structure returning only basic Address fields and fields necessary for lookup and result retrieval:

```
struct afdAddressData {
  char Lookup[256];
  char Name[121];
  char Organisation[121];
  char Property[121];
  char Street[121];
  char Locality[71];
  char Town[31];
  char Postcode[11];
  char PostcodeFrom[9];
  char Key[256];
  char List[513];
  afdAddressData(){    // constructor - zero the contents
    clear();
  }
  void clear(){
    memset(this,'\0',sizeof(*this));
  }
};
```

Note that the C++ declaration has fields one character larger than the VB one as we are allowing for the addition of a null terminator. The C++ structure also has code to clear the structure negating the need for an additional method to do this.

4.1.2. Function Declaration

Next comes the function declaration which is used to perform all operations with the Common API. This is the AFDData function, found in the afddata.dll (or afddata64.dll for 64-bit systems). It has the following parameters:

DataName (String)

Operation (Long)

tData (Any)
fields to use to lookup and return results.

The function returns a long which is the result code. This will be >= 0 if the function is successful, or < 0 in the case of an error (constants for this are described below).

***Example VB Declaration for AFDData*:**

```
Public Declare Function AFDData Lib "afddata.dll" (ByVal dataName As String, ByVal operation As Long, tData As Any) As Long
```

***Example C++ Declaration for AFDData*:**

```
long __stdcall AFDData(char* dataName, long operation, char* tData);
typedef long(__stdcall *AFDDATA)(char* dataName, long operation, char* tData);
```

4.1.3. Field Specification String

A field specification string is described next, this will vary between the different product types (Address Management, BankFinder and Nearest). Its purpose is to tell the Common API the product type in use and the fields required as well as any additional options. It is a string in the following format:

{Data Name}**@**{Options}**<**{Refiner Options}**>{**{International}**}**@{Field List}

{Data Name} will be one of the following:

Address	Address Management Products
BankFinder	AFD BankFinder
Nearest*	Nearest Integration
List	Functions to list the alias localities for any address. As well as retrieving lists of possible field values (Names & Numbers and TraceMaster only).
Grids	Grid Reference related utility functions
Email	Email utility function
String - Deprecated	String utility functions

* With Nearest this will be followed by your database details in the following format:

Nearest:{DBType}:{DBName}:{UID}:{PWD}:{SQL}:{Primary}

Where:

DBType:	The type of database, O=ODBC, A=Access, P=Paradox, X=Xbase
DBName:	The DSN or database file name (should contain > in place of :)
UID:	Any username needed to connect to the database (ODBC Only)
PWD:	Any password needed to connect to the database (ODBC Only)
SQL:	The SQL string to use to query the data (N/A for FoxPro/Xbase)
Primary:	The Primary Key field

{Options} - One or more of the following options can be used as required:

U – Specifies that the structure passed is in Unicode (Wide Bytes)

L – Specifies that list items should not contain a Tab. Tabs are useful as they help align results correctly with each other; however some environments have list boxes which do not support these and so this option allows them to be omitted.

X – Specifies that Null Terminators should be used rather than space padded values (particularly useful in languages such as C/C++)

F – Specifies that Individual Fields will be retrieved from the Common API rather than a structure – see Appendix I for more information.

G - Specifies that approximate grid references for the locality or town of the address will be supplied for any location which does not contain a grid reference for that postcode (for example some non-geographical addresses, Isle of Man and Channel Islands etc.).

R - Specifies that Royal Mail Postzon grid references are used in-preference to GeoRef grid references.

{Field List} – A list of fields and their lengths to retrieve. (See Appendix A, B or C as appropriate for a list of the possible fields). These are each specified in the following format:

{Field Name 1}:{Field Length 1}@…{Field Name n}:{Field Length n}

Where
{Field Name x} – Specifies the name of the field.
{Field Length x} – Specifies the length of the field.

***Example VB Declaration for the Field Specification string matching the VB type previously given*:**

```
Public Const afdFieldSpec =
"Address@@Lookup:255@Name:120@Organisation:120@Property:120@Street:120@Locality:70@Town:30@Postcod
e:10@PostcodeFrom:8@Key:255@List:512"
```

***Example C++ Declaration for the Field Specification string matching the C++ structure previously given*:**

```
static char afdFieldSpec[2048] =
"Address@LX@Lookup:256@Name:121@Organisation:121@Property:121@Street:121@Locality:71@Town:31@Postcode:1
1@PostcodeFrom:9@Key:256@List:513";
```

Note that when using Nearest the GBGridE, GBGridN, and List fields also specify the name of the field in your database table to use for that field in pointed brackets, e.g.

GBGridE<GridE>:10@GBGridN<GridN>:10@List<Miles, Title>:10

{Refiner Options}

Refiner API users can also add a set of advanced cleaning options, if they are required, to the end of the options portion of the field specification string, enclosing them in pointed brackets, e.g. <0AS>.

The options supported are as follows: (Please see the main Refiner manual for more detail regarding each of these options)

0 - Specifies the default cleaning mode where the address is fully cleaned

1 - Specifies that the postcode should be verified only

2 – Specifies that only full matches should be returned

3 – Uses Attach Mode only (fields are returned based on the postcode)

N – Use non-separated fields (Useful for databases where fields are not seperated, e.g., the street and town are entered on the same line with no comma etc. between them)

A – No Ambiguous Matches (do not return list of addresses to choose from if the address cannot be uniquely matched)

S – No Suggested Matches (do not return a suggested match along with the original address if the address cannot be matched but there is a possible unique match)

U – Assume the Postcode is correct (this option allows less reliable matching on the assumption that the postcode is correct if the address cannot otherwise be verified. In Attach mode this allows a property and postcode to be matched)

T – Give Ambiguous Matches in Preference to Street Level (if an address cannot be uniquely matched to an individual property the original property information is normally retained, this option gives the ambiguous addresses to choose from instead).

P – Match PO Box Last (Some PO Box addresses contain some Street address information too even though the address is meant for a PO Box. If you wish Refiner to try and match it to a street address first, then select this option).

L – Retain Alias Localities (If the address is matched using an alias locality this will be retained in the address – Alias Localities are not normally retained as they are not required for the address to be deliverable).

O – Do not move data to Organisation (Normally Refiner will put additional address data for street level only matches in the property field unless they look like an Organisation or there is already a property. Specifying this option ensures Refiner never returns such data in the Organisation field - useful if you are not going to use the Organisation field returned).

W – Do not use the Default DPS (if an address is not matched to a full Delivery Point Record, a default of 9Z is assigned which can still be used for printing bar codes etc., if you do not wish this to be used then use this option)

F – Do not use Field Placement (By default if an address cannot be matched Refiner attempts to format the address correctly on return, if you would rather it was left "as-is" then use this option.

{International}
If you are also using International data then you will need to add the following string onto the end of your field specification string {Serial:Password:UserID}. (Including the curly brackets). Where:

Serial – This is the serial number you were given on signing up to the service.

Password – This is the password you were assigned on signing up to the service.

UserID – This is optional and specifies a user id to identify this application.

Example VB Declaration for the Field Specification string matching the VB type previously given and using some Refiner options:

```
Public Const afdFieldSpec =
"Address@<0AS>@Lookup:255@Name:120@Organisation:120@Property:120@Street:120@Locality:70@Town:30@Po
stcode:10@PostcodeFrom:8@Key:40@List:512"
```

Example C++ Declaration for the Field Specification string matching the C++ structure previously given and using some Refiner options:

```
static char afdFieldSpec[2048] =
"Address@LX<0AS>@Lookup:256@Name:121@Organisation:121@Property:121@Street:121@Locality:71@Town:31@Post
code:11@PostcodeFrom:9@Key:256@List:513";
```

4.1.4. Function Type Constants

Next a set of constants are defined which specify the lookup and search operations available. The DLL supports the following operations:

Constant	**Value**	**Description**
AFD_POSTCODE_LOOKUP	0	Carries out a standard postcode (or zipcode) lookup from the data specified in the Lookup field. (Not BankFinder)
AFD_POSTCODE_PROPERTY_LOOKUP	1	Carries out a lookup based on a postcode or combination of property name/number and a postcode. (Address Management Only)
AFD_MULTIPLE_FASTFIND_LOOKUP	1	Like a FastFind lookup for Nearest but where a specified locality or town matches multiple locations the user is presented with a list to choose from. (Nearest Only)

AFD_FASTFIND_LOOKUP	2	Full fast-find functionality, allowing either a postcode or an address portion to be entered to find the address.
AFD_SEARCH	3	Reverse search, set fields to specify reverse search criteria. (See Appendix A for details of which fields are searchable in which products). Fields not searchable will be ignored if specified.
AFD_RETRIEVE_RECORD	4	Retrieves a previous record from a lookup/search. Useful when you add items to a list box, using the List field and then wish to retrieve the item the user clicks on. Set the Key field to use this operation with the value of the Key field that was returned from the original lookup/search for the record you want.
AFD_ACCOUNT_VALIDATE	5	Used to validate a supplied sortcode and account number (BankFinder only)
AFD_CARD_VALIDATE	6	Used to validate a supplied card number and optional expiry date (BankFinder only)
AFD_CLEAN	7	Used to clean an address (requires a Refiner API license)
AFD_GET_NEXT	32	Should be specified with any of the lookup or search operations for subsequent calls to obtain the next matching result (END_OF_SEARCH,-6, will be returned if there are no further results to return).
AFD_LIST_BOX	64	Specify with any of the lookup/search operations if you wish the DLL to

		display a listbox for you rather than having to use your own in the case of multiple results. Calls to AFD_GET_NEXT are not needed in this case as the API will only return the result the user selects.
AFD_SHOW_ERROR	128	Set this option if you require the DLL to display any error message (e.g. if no results are found) to the user itself.

***Example VB Constant Declarations*:**

```
Public Const AFD_POSTCODE_LOOKUP = 0
Public Const AFD_POSTCODE_PROPERTY_LOOKUP = 1
Public Const AFD_MULTIPLE_FASTFIND_LOOKUP = 1
Public Const AFD_FASTFIND_LOOKUP = 2
Public Const AFD_SEARCH = 3
Public Const AFD_RETRIEVE_RECORD = 4
Public Const AFD_ACCOUNT_VALIDATE = 5
Public Const AFD_CARD_VALIDATE = 6
Public Const AFD_CLEAN = 7
Public Const AFD_GET_NEXT = 32
Public Const AFD_LIST_BOX = 64
Public Const AFD_SHOW_ERROR = 128
```

***Example C++ Constant Declarations*:**

```
// Function Type Constants
#define AFD_POSTCODE_LOOKUP 0
#define AFD_POSTCODE_PROPERTY_LOOKUP 1
#define AFD_MULTIPLE_FASTFIND_LOOKUP 1
#define AFD_FASTFIND_LOOKUP 2
#define AFD_SEARCH 3
#define AFD_RETRIEVE_RECORD 4
#define AFD_ACCOUNT_VALIDATE 5
#define AFD_CARD_VALIDATE 6
#define AFD_CLEAN 7
#define AFD_GET_NEXT 32
#define AFD_LIST_BOX 64
#define AFD_SHOW_ERROR 128
```

4.1.5. Skip Constants – UK Address Management Only

For address management products skip constants are provided next which can be added to the operation parameter for calls to the AFDData function to skip records, for example to return the first record on a postcode only.

The available options are as follows:

Constant	**Value**	**Description**
AFD_NO_SKIP	0	Default – all matching records are returned
AFD_ADDRESS_SKIP	512	Only the first record per address (e.g., first listed resident) is returned. Only has any effect in Names & Numbers.
AFD_POSTCODE_SKIP	1024	Only the first record per postcode is returned.
AFD_SECTOR_SKIP	1536	Only the first record in each postcode sector is returned. (A postcode sector is the portion of the postcode before the space plus the first digit after it, e.g., B11 1 is a sector).
AFD_OUTCODE_SKIP	2048	Only the first record per Outcode is returned. The Outcode is the portion of the postcode before the space, e.g., B11.
AFD_POST_TOWN_SKIP	2560	Only the first record per Post Town, e.g., Birmingham is returned.
AFD_POSTCODE_AREA_SKIP	3072	Only the first record per Postcode Area is returned. A Postcode Area is the letters at the start of the postcode, e.g., B11 1AA is in Postcode Area B, IM8 is in Postcode Area IM.

Example VB Constant Declarations:

```
Public Const AFD_NO_SKIP = 0
Public Const AFD_ADDRESS_SKIP = 512
Public Const AFD_POSTCODE_SKIP = 1024
Public Const AFD_SECTOR_SKIP = 1536
Public Const AFD_OUTCODE_SKIP = 2048
Public Const AFD_POST_TOWN_SKIP = 2560
Public Const AFD_POSTCODE_AREA_SKIP = 3072
```

Example C++ Constant Declarations:

```
// Function Type Constants
#define AFD_NO_SKIP 0
#define AFD_ADDRESS_SKIP 512
#define AFD_POSTCODE_SKIP 1024
#define AFD_SECTOR_SKIP 1536
#define AFD_OUTCODE_SKIP 2048
#define AFD_POST_TOWN_SKIP 2560
#define AFD_POSTCODE_AREA_SKIP 3072
```

4.1.6. Clearing System Constants – BankFinder Only

The clearing system constants allows you to restrict the results that come back to those which are solely on the UK (BACS) Clearing System or the Irish (IPSO Clearing System), or both systems. Obviously if you are only able to clear through the UK clearing system you should specify this to return results for the UK system only. This constant should be added to the operation parameter for calls to the AFDData function.

The available options are as follows:

Constant	Value	Description
AFD_BOTH_CLEARINGS	0	Default – all matching records are returned
AFD_UK_CLEARING	512	Only records on the UK (BACS) Clearing System are returned
AFD_IRISH_CLEARING	1024	Only records on the Irish (IPSO) Clearing System are returned

Example VB Constant Declarations:

```
Public Const AFD_BOTH_CLEARINGS = 0
Public Const AFD_UK_CLEARING = 512
Public Const AFD_IRISH_CLEARING = 1024
```

Example C++ Constant Declarations:

```
// Function Type Constants
#define AFD_BOTH_CLEARINGS 0
#define AFD_UK_CLEARING 512
#define AFD_IRISH_CLEARING 1024
```

4.1.7. Success Code Constants

These specify the possible success codes returned from any API function:

Constant	Value	Description
AFD_RECORD_BREAK	0	The search/lookup has not completed but may take some time and so is returning to give the user the option to cancel a long search.
AFD_SUCCESS	1	The function was successful, and a matching record has been returned.
AFD_SUCCESS_ NO_VALIDATION	2	This applies only to Bankfinder account number validation and indicates that the function was successful, and the account number should be taken as valid. However, as account numbers on this

		sortcode cannot be validated you may wish to double check it is correct.

4.1.8. Error Code Constants

These specify the possible errors returned from any API function:

Constant	**Value**	**Description**
AFD_ ERROR_INVALID_FIELDSPEC	-1	The field specification string specified is invalid. This shouldn't be returned under normal circumstances.
AFD_ ERROR_NO_RESULTS_FOUND	-2	No records matching your lookup or search criteria were found.
AFD_ERROR_INVALID_ ... _RECORD_NUMBER	-3	The record number provided (e.g., when re-retrieving an item from a list box) is invalid.
AFD_ERROR_OPENING_FILES	-4	An error occurred attempting to open the AFD data files. Check they are correctly installed.
AFD_ERROR_FILE_READ	-5	An error occurred reading the data. Likely to be due to corrupt data so software may need to be re-installed.
AFD_ERROR_END_OF_SEARCH	-6	End of Search (when the last result has already been called off – indicates there are no more results to return).
AFD_DATA_LICENSE_ERROR	-7	Indicates there is an error with the product registration. Normally due to it having expired. Run the Welcome program to re-register the software.
AFD_ERROR_CONFLICTING_ .. _SEARCH_PARAMETERS	-8	Occurs if you attempt to search for a Name and Organisation at the same time. Also occurs with Postcode Plus if the UDPRN field is searched for at the same time as any other field.
AFD_USER_CANCELLED	-99	Indicates that the user clicked the cancel button if the DLL internal list box was used.

The following fields apply to BankFinder validation operations only		
AFD_ERROR_SORTCODE_NOT_FOUND	-12	The sort code specified for an account number validation does not exist.
AFD_ERROR_INVALID_SORTCODE	-13	The sortcode specified for an account number validation is invalid.
AFD_ERROR_INVALID_ACCOUNT_NUMBER	-14	The account number specified for an account number validation is invalid.
AFD_ERROR_INVALID_ROLL_NUMBER	-21	The sort code and account number given are for a building society account which also requires a roll number for account credits. No roll number has been supplied or is incorrect for this building society.
AFD_ERROR_INVALID_IBAN	-22	The International Bank Account Number provided is in an invalid format
AFD_ERROR_UNRECOGNISED_COUNTRY	-23	The IBAN provided contains a country that is not recognised as valid
AFD_ERROR_IBAN_MISMATCH	-24	Both an IBAN and Account Number was provided and these details do not match.
AFD_ERROR_INVALID_EXPIRY	-15	The expiry date specified for a card validation is invalid.
AFD_ERROR_CARD_EXPIRED	-16	The card has expired
AFD_ERROR_INVALID_CARD_NUMBER	-18	The card number specified for a card validation is invalid.
AFD_ERROR_VISA_ATM_ONLY	-19	The card number specified is a Visa card which can be used in an ATM only.
AFD_ERROR_UNRECOGNISED_ .. _CARD_TYPE	-20	While the card number appears to be a valid one, the card is not of any of the known types and is therefore unlikely to be acceptable for payment.

Example VB Constant Declarations:

```
Public Const AFD_ERROR_INVALID_FIELDSPEC = -1
Public Const AFD_ERROR_NO_RESULTS_FOUND = -2
Public Const AFD_ERROR_INVALID_RECORD_NUMBER = -3
Public Const AFD_ERROR_OPENING_FILES = -4
Public Const AFD_ERROR_FILE_READ = -5
Public Const AFD_ERROR_END_OF_SEARCH = -6
Public Const AFD_ERROR_DATA_LICENSE_ERROR = -7
Public Const AFD_ERROR_CONFLICTING_SEARCH_PARAMETERS = -8
Public Const AFD_USER_CANCELLED = -99
```

Example C++ Constant Declarations:

```
#define AFD_ERROR_INVALID_FIELDSPEC -1
#define AFD_ERROR_NO_RESULTS_FOUND -2
#define AFD_ERROR_INVALID_RECORD_NUMBER -3
#define AFD_ERROR_OPENING_FILES -4
#define AFD_ERROR_FILE_READ -5
#define AFD_ERROR_END_OF_SEARCH -6
#define AFD_ERROR_DATA_LICENSE_ERROR -7
#define AFD_ERROR_CONFLICTING_SEARCH_PARAMETERS -8
#define AFD_USER_CANCELLED -99
```

4.1.9. Refiner Status Code Constants

Refiner clean operations return a cleaning constant >= 100 or <= -100 which indicates the status of the cleaning operation. These constants are as follows:

Constant	**Value**	**Description**
AFD_ REFINER_PAF_MATCH	100	Address verified from Postcode and matches a record in PAF identically.
AFD_REFINER_POSTCODE_MATCH	200	Address verified from the Postcode and matches a record in PAF with some correction.
AFD_REFINER_CHANGED_POSTCODE	201	Address verified from a postcode which was substituted due to a Royal Mail recoding and now matches a record in PAF.
AFD_REFINER_ASSUME_POSTCODE_ CORRECT	202	Match was made with the Assume Postcode Correct option enabled only and the address could only be verified on the assumption that the postcode was correct.
AFD_REFINER_ASSUME_CHANGED_ POSTCODE_CORRECT	203	Match was made with the Assume Postcode Correct option enabled and the address could only be verified on the assumption that the postcode was correct after a Royal Mail recoding change.

AFD_REFINER_ASSUME_POSTCODE_ADDED_PROPERTY	204	Match was made with the Assume Postcode Correct option enabled and the address could only be verified on the assumption that the postcode was correct and the property was added in.
AFD_REFINER_ASSUME_CHANGED_POSTCODE_ADDED_PROPERTY	205	Match was made with the Assume Postcode Correct option enabled and the address could only be verified on the assumption that the postcode was correct after a Royal Mail recoding change and the property was added in.
AFD_REFINER_FULL_DPS_MATCH	300	Address verified to PAF with some correction, looking wider than just the specified Postcode.
AFD_REFINER_FULL_DPS_MATCH_NO_ORG	301	Address verified to PAF with ambiguous organisation which was not in the original address so has been omitted.
AFD_REFINER_FULL_DPS_MATCH_LIMITED	302	Match was made with the Assume Postcode Correct option enabled and the Address was verified to PAF to a more limited degree.
AFD_REFINER_STREET_MATCH	400	Address verified to Street Level, i.e. the property was not on PAF, but a unique match to the street was identified on a single postcode.
AFD_REFINER_NO_MATCH_FOUND	-101	No Match Found - Refiner has been unable to match this record.
AFD_REFINER_AMBIGUOUS_POSTCODE	-102	Ambiguous Postcode Match - Refiner has matched this record to Street Level but cannot determine which is the correct Postcode and so has presented each of the possibilities.
AFD_REFINER_SUGGEST_RECORD	-103	Suggested Match. Refiner has given a possibility that this address could match to as it is unique but there was not enough to be certain of a correct match.
AFD_REFINER_AMBIGUOUS_MATCH	-104	Ambiguous Match. Refiner has given several possibilities that this address could match to.

AFD_REFINER_INTERNATIONAL_ ADDRESS	-105	This address was detected as being an International Address and therefore cannot be cleaned as data is only present for cleaning UK, Channel Isles, and Isle of Man addresses.
AFD_REFINER_NO_RECORD_DATA	-106	No record data was supplied. Refiner cannot clean this address as no address data was given.

Example VB Constant Declarations:

```
Public Const AFD_REFINER_PAF_MATCH = 100
Public Const AFD_REFINER_POSTCODE_MATCH = 200
Public Const AFD_REFINER_CHANGED_POSTCODE = 201
Public Const AFD_REFINER_ASSUME_POSTCODE_CORRECT = 202
Public Const AFD_REFINER_ASSUME_CHANGED_POSTCODE_CORRECT = 203
Public Const AFD_REFINER_ASSUME_POSTCODE_ADDED_PROPERTY = 204
Public Const AFD_REFINER_ASSUME_CHANGED_POSTCODE_ADDED_PROPERTY = 205
Public Const AFD_REFINER_FULL_DPS_MATCH = 300
Public Const AFD_REFINER_FULL_DPS_MATCH_NO_ORG = 301
Public Const AFD_REFINER_FULL_DPS_MATCH_LIMITED = 302
Public Const AFD_REFINER_STREET_MATCH = 400
Public Const AFD_REFINER_NO_MATCH_FOUND = -101
Public Const AFD_REFINER_AMBIGUOUS_POSTCODE = -102
Public Const AFD_REFINER_SUGGEST_RECORD = -103
Public Const AFD_REFINER_AMBIGUOUS_MATCH = -104
Public Const AFD_REFINER_INTERNATIONAL_ADDRESS = -105
Public Const AFD_REFINER_NO_RECORD_DATA = -106
```

***Example C++ Constant Declarations*:**

```
#define AFD_REFINER_PAF_MATCH 100
#define AFD_REFINER_POSTCODE_MATCH 200
#define AFD_REFINER_CHANGED_POSTCODE 201
#define AFD_REFINER_ASSUME_POSTCODE_CORRECT 202
#define AFD_REFINER_ASSUME_CHANGED_POSTCODE_CORRECT 203
#define AFD_REFINER_ASSUME_POSTCODE_ADDED_PROPERTY 204
#define AFD_REFINER_ASSUME_CHANGED_POSTCODE_ADDED_PROPERTY 205
#define AFD_REFINER_FULL_DPS_MATCH 300
#define AFD_REFINER_FULL_DPS_MATCH_NO_ORG 301
#define AFD_REFINER_FULL_DPS_MATCH_LIMITED 302
#define AFD_REFINER_STREET_MATCH 400
#define AFD_REFINER_NO_MATCH_FOUND -101
#define AFD_REFINER_AMBIGUOUS_POSTCODE -102
#define AFD_REFINER_SUGGEST_RECORD -103
#define AFD_REFINER_AMBIGUOUS_MATCH -104
#define AFD_REFINER_INTERNATIONAL_ADDRESS -105
#define AFD_REFINER_NO_RECORD_DATA -106
```

4.1.10. AFDErrorText Function

This is a helper function that the Wizard will generate, which will convert an error code (return value less than zero) to a message which explains the error. This makes it easy to simply use this function to obtain text to display in the case of an error. Text is included for each of the error codes listed in the Error Code Constants section above.

4.1.11. AFD RefinerCleaningText Function

This is a helper function that the Wizard will generate, which will convert a return code from the Common API when using the AFD_CLEAN option to a message which explains the error. This makes it easy to simply use this function to obtain text to display in the case of an error. Text is included for each of the error codes listed in the Refiner Status Code Constants section above. Please note that this function is only useful if you are using Refiner API functionality with the appropriate license.

4.1.12. Clear Function

The wizard also generates a helper function to clear the AFD Type or Structure, which you should call prior to carrying out an operation using the API. This is either called ClearAFDAddressData or ClearAFDBankData for Address Management products and BankFinder respectively. The differing names allow these to co-exist in the same module if desired when using both products.

Note: This does not apply to C++ code as they include a clear function in the structure declaration itself.

4.1.13. afdInitDLL

Where necessary, e.g., in C++ a function is also included which will load the DLL and locate the AFDData function:

4.1.14. Differences with .NET

The API works in an identical way with .NET as it does with all other development environments. However, the code generated for .NET includes a wrapper function AFDData to convert the .NET structure to a string that can be passed to the API. You should use the API Wizard for your environment to see this function.

4.1.15. List Functions – Address Management Only

With Postcode Plus, Names & Numbers and TraceMaster products you can obtain the alias localities for any address or postcode if required. These are non-postally required localities held by Royal Mail which can or may be included on an address if desired. An example of this would be including Wimbledon for an address in London. You should note that these are stored at postal sector level (e.g., SW19 1) and there are often multiple entries for an address so a locality being returned does not mean it is necessarily the best one for the particular address you are viewing.

For Names & Numbers and TraceMaster products only it is also possible to obtain a list of possible values for most fields, e.g., all the Mailsort codes present, business descriptions, etc. You can also specify the start value of the field, e.g., return all surnames present starting with "Smith".

When using International data, you can also use the List functions to obtain a list of all available countries (names or ISO codes).

To use these functions an AFDListData structure should be declared containing the following fields:

Field Name	**Length**	**Description**
Lookup	255	In the case of retrieving an alias locality this should be the postcode or key of the address to obtain the alias localities for. In the case of Names & Numbers or TraceMaster lists this should either be blank to retrieve the full list or contain the value you wish entries to start with.
List	255	Each matching locality name or list entry is returned, in turn, into this field.
Product	40	Optional: Would indicate the product used if desired.

An afdListFieldSpec string should also be declared and works as described in section 4.1.3.

The constants you can use with this function to specify the list operation you wish to perform are as follows:

Constant	**Value**	**Description**
AFD_LIST_ALIAS_LOCALITY	0	Returns all alias localities for the sector that the specified postcode or key resides in.
The following are applicable when using International data only:		
AFD_LIST_COUNTRY_ISO	3	Will return the ISO codes of all available countries.
AFD_LIST_COUNTRY	4	Will return the names of all available countries.
The following are applicable to Names & Numbers and TraceMaster Products Only: These all return a list of all entries of the data item specified in the data Setting the lookup parameter will restrict matches to only those items starting with the specified string.		
AFD_LIST_FORENAME	10	Returns Forenames (first names).
AFD_LIST_SURNAME	11	Returns Surnames
AFD_LIST_ORGANISATION	12	Returns Organisations
AFD_LIST_PROPERTY	13	Returns Properties
AFD_LIST_STREET	14	Returns Streets
AFD_LIST_LOCALITY	15	Returns Localities
AFD_LIST_TOWN	16	Returns Postal Towns
AFD_LIST_COUNTY	17	Returns Counties (This includes Postal, Traditional and Administrative County names)
AFD_LIST_MAILSORT_CODE	18	Returns Mailsort codes
AFD_LIST_URBAN_RURAL_CODE	19	Returns Urban Rural Codes
AFD_LIST_URBAN_RURAL_NAME	20	Returns Urban Rural Names
AFD_LIST_WARD_CODE	21	Returns Ward Codes
AFD_LIST_WARD_NAME	22	Returns Ward Names
AFD_LIST_CONSTITUENCY	23	Returns Constituencies
AFD_LIST_EER_CODE	24	Returns EER Codes (European Electoral Region Codes)
AFD_LIST_EER_NAME	25	Returns EER Names
AFD_LIST_AUTHORITY_CODE	26	Returns Local / Unitary Authority Codes
AFD_LIST_AUTHORITY	27	Returns Authority Names

AFD_LIST_LEA_CODE	28	Returns LEA Codes (Local Education Authority)
AFD_LIST_LEA_NAME	29	Returns LEA Names
AFD_LIST_TV_REGION	30	Returns TV Regions
AFD_LIST_NHS_CODE	31	Returns NHS Codes
AFD_LIST_NHS_NAME	512	Returns NHS Names
AFD_LIST_NHS_REGION_CODE	513	Returns NHS Region Codes
AFD_LIST_NHS_REGION_NAME	514	Returns NHS Region Names
AFD_LIST_PCT_CODE	515	Return CCG Codes
AFD_LIST_PCT_NAME	516	Return CCG Names
AFD_LIST_CENSATION_CODE	517	Returns Censation Codes
AFD_LIST_AFFLUENCE	518	Returns Censation Affluence Codes with descriptions
AFD_LIST_LIFESTAGE	519	Returns Censation Lifestage Codes with descriptions
AFD_LIST_ADDITIONAL_CENSUS_INFO	520	Returns Censation Additional Information with descriptions.
AFD_LIST_HOUSEHOLD_COMPOSITION	521	Returns Household composition codes with descriptions.
AFD_LIST_BUSINESS	522	Returns Business descriptions
AFD_LIST_SIZE	523	Returns Company Size catagories
AFD_LIST_SIC_CODE	524	Returns SIC Codes
AFD_LIST_COUNCIL_TAX_BAND	525	Returns Council Tax Bands
AFD_LIST_CONSTITUENCY_CODE	528	Returns Constituency Codes
AFD_LIST_SUB_COUNTRY_NAME	529	Returns Sub Country Names
AFD_LIST_DEVOLVED_CONSTITUENCY_CODE	531	Returns Devolved Constituency Codes
AFD_LIST_DEVOLVED_CONSTITUENCY_NAME	532	Returns Devolved Constituency Names

Example VB Constant Declarations for List Functions:

```
Public Const AFD_LIST_ALIAS_LOCALITY = 0
Public Const AFD_LIST_COUNTRY_ISO = 3
Public Const AFD_LIST_COUNTRY = 4
Public Const AFD_LIST_FORENAME = 10
Public Const AFD_LIST_SURNAME = 11
Public Const AFD_LIST_ORGANISATION = 12
Public Const AFD_LIST_PROPERTY = 13
Public Const AFD_LIST_STREET = 14
Public Const AFD_LIST_LOCALITY = 15
Public Const AFD_LIST_TOWN = 16
Public Const AFD_LIST_COUNTY = 17
Public Const AFD_LIST_MAILSORT_CODE = 18
Public Const AFD_LIST_URBAN_RURAL_CODE = 19
Public Const AFD_LIST_URBAN_RURAL_NAME = 20
Public Const AFD_LIST_WARD_CODE = 21
Public Const AFD_LIST_WARD_NAME = 22
Public Const AFD_LIST_CONSTITUENCY = 23
Public Const AFD_LIST_EER_CODE = 24
Public Const AFD_LIST_EER_NAME = 25
Public Const AFD_LIST_AUTHORITY_CODE = 26
Public Const AFD_LIST_AUTHORITY = 27
Public Const AFD_LIST_LEA_CODE = 28
Public Const AFD_LIST_LEA_NAME = 29
Public Const AFD_LIST_TV_REGION = 30
Public Const AFD_LIST_NHS_CODE = 31
Public Const AFD_LIST_NHS_NAME = 512
Public Const AFD_LIST_NHS_REGION_CODE = 513
Public Const AFD_LIST_NHS_REGION_NAME = 514
Public Const AFD_LIST_PCT_CODE = 515
Public Const AFD_LIST_PCT_NAME = 516
Public Const AFD_LIST_CENSATION_CODE = 517
Public Const AFD_LIST_AFFLUENCE = 518
Public Const AFD_LIST_LIFESTAGE = 519
Public Const AFD_LIST_ADDITIONAL_CENSUS_INFO = 520
Public Const AFD_LIST_HOUSEHOLD_COMPOSITION = 521
Public Const AFD_LIST_BUSINESS = 522
Public Const AFD_LIST_SIZE = 523
Public Const AFD_LIST_SIC_CODE = 524
Public Const AFD_LIST_COUNCIL_TAX_BAND = 525
```

Example C++ Constant Declarations for List Functions:

```
// Function Type Constants
#define AFD_LIST_ALIAS_LOCALITY 0
#define AFD_LIST_COUNTRY_ISO 3
#define AFD_LIST_COUNTRY 4
#define AFD_LIST_FORENAME 10
#define AFD_LIST_SURNAME 11
#define AFD_LIST_ORGANISATION 12
#define AFD_LIST_PROPERTY 13
#define AFD_LIST_STREET 14
#define AFD_LIST_LOCALITY 15
#define AFD_LIST_TOWN 16
#define AFD_LIST_COUNTY 17
#define AFD_LIST_MAILSORT_CODE 18
#define AFD_LIST_URBAN_RURAL_CODE 19
#define AFD_LIST_URBAN_RURAL_NAME 20
#define AFD_LIST_WARD_CODE 21
#define AFD_LIST_WARD_NAME 22
#define AFD_LIST_CONSTITUENCY 23
#define AFD_LIST_EER_CODE 24
#define AFD_LIST_EER_NAME 25
#define AFD_LIST_AUTHORITY_CODE 26
#define AFD_LIST_AUTHORITY 27
#define AFD_LIST_LEA_CODE 28
#define AFD_LIST_LEA_NAME 29
#define AFD_LIST_TV_REGION 30
#define AFD_LIST_NHS_CODE 31
#define AFD_LIST_NHS_NAME 512
#define AFD_LIST_NHS_REGION_CODE 513
#define AFD_LIST_NHS_REGION_NAME 514
#define AFD_LIST_PCT_CODE 515
```

```
#define AFD_LIST_PCT_NAME 516
#define AFD_LIST_CENSATION_CODE 517
#define AFD_LIST_AFFLUENCE 518
#define AFD_LIST_LIFESTAGE 519
#define AFD_LIST_ADDITIONAL_CENSUS_INFO 520
#define AFD_LIST_HOUSEHOLD_COMPOSITION 521
#define AFD_LIST_BUSINESS 522
#define AFD_LIST_SIZE 523
#define AFD_LIST_SIC_CODE 524
#define AFD_LIST_COUNCIL_TAX_BAND 525
```

4.1.16. Utility Declarations – Address Management Only

These utility functions are not necessary for core address or bank validation functionality but provide additional functionality that may be useful in your application. For full details of what these functions can do please refer to section 4.7 of this document.

4.1.17. String Utility Declarations – Depreciated and Unsupported

These are provided for compatibility with existing applications which may depend on them but for new developments we would recommend you use in-built functions which are included with most modern development environments. For the String Utility functions an AFDStringData structure is declared, containing the fields specified in Appendix E of this manual for String functions. An afdStringFieldSpec is also declared and works in the same way as the general field specification string documented earlier in this section. The following operation constants are also defined which are used to specify the string operation you wish to perform:

Constant	**Value**	**Description**
AFD_ STRING_SEARCH_REPLACE	0	All occurrences in the string specified in the Lookup field of the string specified in the Search field are replaced with the string in the Replace field.
AFD_STRING_SEARCH_REPLACE_CASE	1	This is the same as AFD_STRING_SEARCH_REPLACE but is case sensitive.
AFD_STRING_CAPITALISE	2	This corrects the capitalisation of the string specified in the Lookup field. For example, 'commercial STREET' would become 'Commercial Street'.

AFD_STRING_CLEAN_LINE	3	This cleans the string specified in the Lookup field by removing spurious characters that should not be in an address line, e.g. a trailing comma.
AFD_STRING_CHECK_POSTCODE	4	This checks if the string specified in the Lookup field looks like a postcode.
AFD_STRING_CLEAN_POSTCODE	5	This cleans the postcode specified in the Lookup field to tidy up the postcode specified.
AFD_STRING_ABBREVIATE_COUNTY	6	This provides the Royal Mail Approved county abbreviation for the county specified in the Lookup field if one exists.

***VB Declarations for String Utility Functions*:**

```
Public Type AFDStringData
  Lookup As String * 255
  Outcode As String * 4
  Incode As String * 3
  Search As String * 255
  Replace As String * 255
End Type
Public Const afdStringFieldSpec = "String@@Lookup:255@Outcode:4@Incode:3@Search:255@Replace:255"
Public Const AFD_STRING_SEARCH_REPLACE = 0
Public Const AFD_STRING_SEARCH_REPLACE_CASE = 1
Public Const AFD_STRING_CAPITALISE = 2
Public Const AFD_STRING_CLEAN_LINE = 3
Public Const AFD_STRING_CHECK_POSTCODE = 4
Public Const AFD_STRING_CLEAN_POSTCODE = 5
Public Const AFD_STRING_ABBREVIATE_COUNTY = 6
```

***C++ Declarations for String Utility Declarations*:**

```
struct afdStringData {
  char Lookup[256];
  char Outcode[5];
  char Incode[4];
  char Search[256];
  char Replace[256];
  afdStringData(){    // constructor - zero the contents
    clear();
  }
  void clear(){
    memset(this,'\0',sizeof(*this));
  }
};
static char afdStringFieldSpec[2048] =
"String@LX@Lookup:256@Outcode:5@Incode:4@Search:256@Replace:256";
#define AFD_STRING_SEARCH_REPLACE 0
#define AFD_STRING_SEARCH_REPLACE_CASE 1
```

```
#define AFD_STRING_CAPITALISE 2
#define AFD_STRING_CLEAN_LINE 3
#define AFD_STRING_CHECK_POSTCODE 4
#define AFD_STRING_CLEAN_POSTCODE 5
#define AFD_STRING_ABBREVIATE_COUNTY 6
```

4.1.18. Grid Utility Declarations (UK Address Management Only)

For the Grid Utility functions an AFDGridData structure is declared, containing the fields specified in Appendix E of this manual for Grid functions. An afdGridFieldSpec is also declared and works in the same way as the general field specification string documented earlier in this section. The following operation constants are also defined which are used to specify the grid operation you wish to perform:

Constant	Value	Description
AFD_GRID_CONVERT	512	Converts a GB or NI based grid reference, or latitude and longitude value to all other grid reference types and latitude and longitude values. (This uses a 1m resolution (6 digit). Using a constant of 0 rather than 512 uses 5-digit grids).
AFD_GRID_LOOKUP_LOCATION	513	Looks up a town, locality, or partial postcode specified in the Lookup field and provides an approximate grid reference for the location if a match is found (returns multiple results if there are multiple matches for this location). (This uses a 1m resolution (6 digit). Using a constant of 1 rather than 513 uses 5-digit grids).
AFD_GRID_DISTANCE	514	Calculates the distance between a pair of grid references or latitude and longitude values specified. (This uses a 1m resolution (6 digit). Using a constant of 2 rather than 514 uses 5-digit grids).

VB Declarations for Grid Utility Functions:

```
Public Type AFDGridData
  Lookup As String * 255
  GBGridE As String * 10
  GBGridN As String * 10
  NIGridE As String * 10
  NIGridN As String * 10
  Latitude As String * 10
  Longitude As String * 10
  TextualLatitude As String * 15
  TextualLongitude As String * 15
  Km As String * 6
  Miles As String * 6
  GBGridEFrom As String * 10
  GBGridNFrom As String * 10
  NIGridEFrom As String * 10
  NIGridNFrom As String * 10
  LatitudeFrom As String * 10
  LongitudeFrom As String * 10
  TextualLatitudeFrom As String * 15
  TextualLongitudeFrom As String * 15
End Type
Public Const afdGridFieldSpec =
"Grid@@Lookup:255@GBGridE:10@GBGridN:10@NIGridE:10@NIGridN:10@Latitude:10@Longitude:10@TextualLatitude:
15@TextualLongitude:15@Km:6@Miles:6@GBGridEFrom:10@GBGridNFrom:10@NIGridEFrom:10@NIGridNFrom:10@Lat
itudeFrom:10@LongitudeFrom:10@TextualLatitudeFrom:15@TextualLongitudeFrom:15"
Public Const AFD_GRID_CONVERT = 512
Public Const AFD_GRID_LOOKUP_LOCATION = 513
Public Const AFD_GRID_DISTANCE = 514
```

C++ Declarations for Grid Utility Declarations:

```
struct afdGridData {
  char Lookup[256];
  char GBGridE[11];
  char GBGridN[11];
  char NIGridE[11];
  char NIGridN[11];
  char Latitude[11];
  char Longitude[11];
  char TextualLatitude[16];
  char TextualLongitude[16];
  char Km[7];
  char Miles[7];
  char GBGridEFrom[11];
  char GBGridNFrom[11];
  char NIGridEFrom[11];
  char NIGridNFrom[11];
  char LatitudeFrom[11];
  char LongitudeFrom[11];
  char TextualLatitudeFrom[16];
  char TextualLongitudeFrom[16];
  afdGridData(){    // constructor - zero the contents
    clear();
  }
  void clear(){
    memset(this,'\0',sizeof(*this));
  }
};
static char afdGridFieldSpec[2048] =
"Grid@@Lookup:256@GBGridE:11@GBGridN:11@NIGridE:11@NIGridN:11@Latitude:11@Longitude:11@TextualLatitude:16@
TextualLongitude:16@Km:7@Miles:7@GBGridEFrom:11@GBGridNFrom:11@NIGridEFrom:11@NIGridNFrom:11@LatitudeFr
om:11@LongitudeFrom:11@TextualLatitudeFrom:16@TextualLongitudeFrom:16";
#define AFD_GRID_CONVERT 512
#define AFD_GRID_LOOKUP_LOCATION 513
#define AFD_GRID_DISTANCE 514
```

4.1.19. Email Utility Declarations

For the Email Utility function an AFDEmailData structure is declared, containing the fields specified in Appendix E of this manual for Email functions. An afdEmailFieldSpec is also declared and works in the same way as the general field specification string documented earlier in this section. The following operation constants are also defined which are used to specify the level of email validation that you wish to perform:

Constant	**Value**	**Description**
AFD_EMAIL_FULL	0	Full email validation including live domain lookup
AFD_EMAIL_FORMAT	2	Validate email addres format is correct only
AFD_EMAIL_TLD	3	Validate email format is correct and the top-level domain exists
AFD_EMAIL_LOCAL	4	Validate email format, top level domain and for well-known domains carry out additional checks of the local portion of the address

***VB Declarations for Email Utility Functions*:**

```
Public Type AFDEmailData
 Email As String * 255
End Type
Public Const afdEmailFieldSpec = "Email@@Email:255"
Public Const AFD_EMAIL_FULL = 0
Public Const AFD_EMAIL_FORMAT = 2
Public Const AFD_EMAIL_TLD = 3
Public Const AFD_EMAIL_LOCAL = 4
```

***C++ Declarations for Email Utility Declarations*:**

```
struct afdEmailData {
 char Email[256];
 afdEmailData(){    // constructor - zero the contents
  clear();
 }
 void clear(){
  memset(this,'\0',sizeof(*this));
 }
};
static char afdEmailFieldSpec[2048] = "Email@@Email:256";
#define AFD_EMAIL_FULL = 0
#define AFD_EMAIL_FORMAT = 2
#define AFD_EMAIL_TLD = 3
#define AFD_EMAIL_LOCAL = 4
```

4.2. Lookup Function

The most commonly used function across our product range is the Lookup function. By entering a single string, the user can find the results matching there lookup criteria.

With our address management products three lookup types are provided which you specify as the operation parameter in a call to AFDData:

Operation Constant	**Functionality**
AFD_FASTFIND_LOOKUP	This method is the most flexible, enabling the user to lookup an address simply by entering the postcode, or by using search criteria such as "Commercial Street, Birmingham" to quickly find matching records.
AFD_POSTCODE_PROPERTY_LOOKUP	This method allows the user to type in any postcode (or zipcode) and, optionally, include optional property information to find a match. For example "304, B11 1AA". When full fastfind functionality is not required using this operation can prevent erroneous input causing long searches.
AFD_POSTCODE_LOOKUP	The user can type in any postcode (or zipcode), e.g. "B11 1AA" and obtain the results for that postcode. Only full correct postcodes are accepted. This is useful when you only want a postcode lookup, for example if you are looking up a list of postcodes to obtain grid references.

Similarily with Nearest, three lookup types are also provided (although they differ slightly due to the nature of the product):

Operation Constant	**Functionality**
AFD_FASTFIND_LOOKUP	This method is the most flexible, enabling the user to find the nearest simply by entering the postcode, or by entering a locality or town name, or a partial postcode.
AFD_MULTIPLE_FASTFIND_LOOKUP	This is similar to AFD_FASTFIND_LOOKUP, except that where a locality or town is given which has multiple matches the user

	will be presented with a list of locations to choose from to then lookup to find the Nearest.
AFD_POSTCODE_LOOKUP	The user can type in any postcode, e.g. "B11 1AA" and obtain the Nearest records to that postcode. Only full correct postcodes are accepted.

With BankFinder the only option available is AFD_FASTFIND_LOOKUP which allows you to find a bank using a sort code, postcode, or other criteria quickly.

To carry out a lookup you will first need to declare an instance of the AFD structure you have declared in your general declarations module or class (see Section 4.1).

You will then need to set the Lookup parameter to the postcode or fast find string that you wish to look up.

If you are using International data, you should also set the CountryISO or Country field to specify the country to carry out the lookup for.

If you are using Nearest you should also set the MaxRecords parameter to indicate the maximum number of records to return and the Miles or Km parameter to specify the maximum distance to return. Using low values for these options speeds up the lookup.

You then call the AFDData function with the following three parameters:

1. The Field Specification String (as detailed in Section 4.1)
2. The operation constant you require (one of the 3 above)
3. The instance of the structure or type that you declared.

If you would prefer not to use your own list box in your application, you may wish to add to the operation constant the AFD_LIST_BOX option. This causes the DLL to display a list box for you returning the record that the user selects, rather than returning all matching records to your application. This is only suitable for desktop applications as it displays the list box on-screen.

Similarly adding AFD_SHOW_ERROR causes the DLL to display any error message to the user itself.

Should you wish to use one of the skip options in Address Management, for example returning the first record per sector only you can also add any of the Skip constants listed in the declarations (see Section 4.1).

When using BankFinder you may wish to add the clearing system you wish to restrict records to as well. Using AFD_UK_CLEARING restricts records to those on the UK (BACS) clearing system only. Using AFD_IRISH_CLEARING restricts records to those on the Irish (IPSO) clearing system only. If you can only clear through the UK system, it is important to use the AFD_UK_CLEARING constant.

The AFDData function will return a negative value (less than zero) in the case of an error. Unless you have used the AFD_SHOW_ERROR option to ask the DLL to present any error to the user, you should display an error for the user before aborting the lookup. The AFDErrorText function will help you obtain a string which can be useful for displaying to the user to describe the error.

In the case of Address Management products, the PostcodeFrom field of the structure or type will be set if a postcode was looked up which has changed following a Royal Mail recoding. The lookup will complete using the new postcode (found in the Postcode field), however you may wish to display a message notifying the user of this.

If the return value from the AFDData function is AFD_SUCCESS, then a matching result has been returned and you can access the fields in the structure or type instance supplied to obtain full details for it. Included in this is a List property that can be used to provide a formatted item for adding to a list box to allow the user to select the desired option if desired. The Key property should also be stored as this allows quick retrieval of the record should it be selected using the ListFetch method described in Section 4.4.

If you have specified the AFD_LIST_BOX option, then the user will have selected the required item and you can access the fields in the supplied structure or type instance and the lookup is complete.

Otherwise, you will have retrieved the first record which you can add to a list box if desired. If the return value was AFD_RECORD_BREAK then no result has yet been returned but the lookup is taking some time (would not occur with a postcode or property, postcode lookup) and so the user is being given the chance to cancel.

To retrieve the rest of the records you should call the AFDData function as above repeatedly with the same operation code as before but adding the AFD_GET_NEXT constant to it to obtain subsequent records. These can be added to a list box as above or processed as required. You should call AFDData in a lookup to retrieve these records allowing the user to cancel the lookup should it take some time, or they realise they have entered something incorrectly.

Example VB code for an Address Management Lookup:

```
 Dim details As AFDAddressData
 Dim retVal As Long
 Static running As Boolean

 ' Prevent corruption of list box from button being clicked twice
 If running Then Exit Sub
 running = True

 ' Replace lstResult with the name of your list box for the results
 With lstResult

 ' Clear out any existing items in the list
 .Clear

 ' Reset Cancel flag
 cancelFlag = False

 ' Set the lookup
 details.Lookup = txtLookup.Text ' Change txtLookup to your lookup entry textbox

 ' Carry out the lookup (no need to alter the line below, unless you want to add a sector skip option - see
constants)
 retVal = AFDData(afdFieldSpec, AFD_FASTFIND_LOOKUP + AFD_SECTOR_SKIP, details)

 ' Abort with Message if error or user cancelled
 If retVal < 0 Then
   MsgBox AFDErrorText(retVal)
   running = False
   Exit Sub
 End If

 ' Display any changed postcode if applicable
 If Trim(details.PostcodeFrom) <> "" Then
   MsgBox "Postcode has changed from " + Trim(details.PostcodeFrom) + " to " + Trim(details.Postcode)
```

```
End If

' Now add matching records to the list box
Do While retVal >= 0
  If retVal <> AFD_RECORD_BREAK Then
    ' Add the item to the list box with hidden key at the end
    .AddItem details.List + details.Key
  End If
  ' Give user the chance to cancel and allow list box to update
  DoEvents
  ' Check if user cancelled
  If cancelFlag Then
    MsgBox "Lookup Cancelled"
    running = False
    Exit Sub
  End If
  retVal = AFDData(afdFieldSpec, AFD_GET_NEXT + AFD_FASTFIND_LOOKUP, details)
Loop

' Check results have been returned
If .ListCount = 0 Then
  MsgBox "No Results Found"
Else
  .ListIndex = 0 ' Select First item in the list
End If

End With

running = False
```

Example C++ Code For an Address Management Lookup (Visual C++)

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
static bool running = false;
afdAddressData details;
char listItem[2055];
char msgTxt[255];
long retVal;
CListBox* listBox;
MSG msg;

// Check if we are already running to prevent crossing over items in the listbox
if (running) return;
running = true;

// Load DLL
if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
}

// Replace m_lstResult with the name given to a variable assigned to your list box control for the results
listBox = &m_lstResult;

// Clear out any existing items in the list
listBox->ResetContent();
```

```
  // Reset Cancel flag
  cancelFlag = false;

  // Update Data so we can read the lookup variable
  UpdateData(TRUE);

  // Set the lookup
  strcpy(details.Lookup, m_txtLookup); // Change this to your lookup entry textbox value variable

  // Carry out the lookup (no need to alter the line below, unless you want to add a sector skip option - see
constants)
  retVal = (afdData)(afdFieldSpec, AFD_FASTFIND_LOOKUP, (char*)&details);

  // Abort with Message if error or user cancelled
  if (retVal < 0) {
    AFDErrorText(retVal, msgTxt);
    MessageBox(msgTxt, "Error", 0);
    running = false;
    return;
  }

  // Display any changed postcode if applicable
  if (details.PostcodeFrom[0] != '\0') {
    strcpy(msgTxt, "Postcode has changed from ");
    strcat(msgTxt, details.PostcodeFrom);
    strcat(msgTxt, " to ");
    strcat(msgTxt, details.Postcode);
    MessageBox(msgTxt, "Changed Postcode", 0);
  }

  // Now add matching records to the list box
  while (retVal >= 0) {
    if (retVal != AFD_RECORD_BREAK) {
      // make up list item with hidden key at the end
      strncpy(listItem, details.List, sizeof(details.List));
      strncpy(listItem + sizeof(details.List), details.Key, sizeof(details.Key));
      listItem[sizeof(details.List) + sizeof(details.Key)] = '\0';
      // Add the item to the list box
      listBox->AddString(listItem);
    }
    // Give user the chance to cancel and allow list box to update
    if(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)) {
      TranslateMessage(&msg);
      DispatchMessage(&msg);
    }
    // Check if user cancelled
    if (cancelFlag) {
      MessageBox("Search Cancelled", "Cancelled", 0);
      return;
    }
    retVal = (afdData)(afdFieldSpec, AFD_GET_NEXT + AFD_FASTFIND_LOOKUP, (char*)&details);
  }

  // Check results have been returned
  if (listBox->GetCount() == 0)
    MessageBox("No Results Found", "Error", 0);
```

```
else {
  listBox->SetCurSel(0); // Select First item in the list

  OnSelchangeLstResult(); // Set this to your list change method to simulate selecting the first list item

}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;

running = false;
```

4.3. Search Function

The search function allows records to be located by searching using specific fields rather than a general lookup string. It allows any of the Fields to be searched that are specified as being searchable for the AFD product that you are using in Appendix A (for Address Management products) or Appendix B (for BankFinder). All fields in your database are searchable in the case of Nearest.

To carry out a search you will first need to declare an instance of the AFD structure you have declared in your general declarations module or class (see Section 4.1).

You will then need to set the fields that you wish to search on to the criteria that you wish to use. Note that if you specify a field that is not searchable in the product that you are using it will be ignored.

If you are using International data, you should also set the CountryISO or Country field to specify the country to carry out the lookup for.

You then call the AFDData function with the following three parameters:

1. The Field Specification String (as detailed in Section 4.1)
2. The operation code (AFD_SEARCH constant)
3. The instance of the structure or type that you declared.

If you would prefer not to use your own list box in your application, you may wish to add to the operation constant the AFD_LIST_BOX option. This causes the DLL to display a list box for you returning the record that the user selects, rather than returning all matching records to your application. This is only suitable for desktop applications as it displays the list box on-screen. Similarly adding AFD_SHOW_ERROR causes the DLL to display any error message to the user itself.

Should you wish to use one of the skip options in Address Management, for example returning the first record per sector only you can also add any of the Skip constants listed in the declarations (see Section 4.1).

When using BankFinder you may wish to add the clearing system you wish to restrict records to as well. Using AFD_UK_CLEARING restricts records to those on the UK (BACS) clearing system only. Using AFD_IRISH_CLEARING restricts records to those on the Irish (IPSO) clearing system only. If you can only clear through the UK system, it is important to use the AFD_UK_CLEARING constant.

The AFDData function will return a negative value (less than zero) in the case of an error. Unless you have used the AFD_SHOW_ERROR option to ask the DLL to present any error to the user, you should display an error for the user before aborting the lookup. The AFDErrorText function will help you obtain a string which can be useful for displaying to the user to describe the error.

If the return value from the AFDData function is AFD_SUCCESS, then a matching result has been returned and you can access the fields in the structure or type instance supplied to obtain full details for it. Included in this is a List property that can be used to provide a formatted item for adding to a list box to allow the user to select the desired option if desired. The Key property should also be stored as this allows quick retrieval of the record should it be selected using the ListFetch method described in Section 4.4.

If you have used the M and T options in the field specification to return all records at once from the API, then you will have all matching records in the array you specified so the search is complete. If you have specified the AFD_LIST_BOX option, then the user will have selected the required item and so you can access the fields in the supplied structure or type instance and the search is complete.

Otherwise, you will have retrieved the first record which you can add to a list box if desired. If the return value was AFD_RECORD_BREAK then no result has yet been returned but the search is taking some time (would not occur with a postcode or property, postcode lookup) and so the user is being given the chance to cancel.

To retrieve the rest of the records you should call the AFDData function as above repeatedly with the same operation code as before but adding the AFD_GET_NEXT constant to it to obtain subsequent records. These can be added to a list box as above or processed as required. You should call AFDData in a lookup to retrieve these records allowing the user to cancel the lookup should it take some time, or they realise they have entered something incorrectly.

Example VB code for an Address Management Search:

```
 Dim details As AFDAddressData
 Dim retVal As Long

 Static running As Boolean

 ' Prevent corruption of list box from button being clicked twice
 If running Then Exit Sub
 running = True

 ' Replace lstResult with the name of your list box for the results
 With lstResult

 ' Clear out any existing items in the list
 .Clear

 ' Reset Cancel flag
 cancelFlag = False

 ' Clear Structure
 ClearAFDAddressData details

 ' Set the fields you wish to search on (look at the other properties of the structure)
 details.Organisation = txtSearchOrganisation.Text
 details.Property = txtSearchProperty.Text
 details.Street = txtSearchStreet.Text
 details.Locality = txtSearchLocality.Text
 details.Town = txtSearchTown.Text
 details.Postcode = txtSearchPostcode.Text

 ' Carry out the search (no need to alter the line below, unless you want to add a sector skip option - see
constants)
 retVal = AFDData(afdFieldSpec, AFD_SEARCH + AFD_SECTOR_SKIP, details)

 ' Abort with Message if error or user cancelled
```

```
If retVal < 0 Then
  MsgBox AFDErrorText(retVal)
  running = False
  Exit Sub
End If

' Now add matching records to the list box
Do While retVal >= 0
  If retVal <> AFD_RECORD_BREAK Then
    ' Add the item to the list box with hidden key at the end
    .AddItem details.List + details.Key
  End If
  DoEvents
  If cancelFlag Then
    MsgBox "Search Cancelled"
    running = False
    Exit Sub
  End If
  retVal = AFDData(afdFieldSpec, AFD_GET_NEXT + AFD_SEARCH, details)
Loop

' Check results have been returned
If .ListCount = 0 Then
  MsgBox "No Results Found"
Else
  .ListIndex = 0 ' Select First item in the list
End If

End With

running = False
```

Example C++ Code For an Address Management Search (Visual C++)

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
static bool running = false;
afdAddressData details;
char listItem[2055];
char msgTxt[255];
long retVal;
CListBox* listBox;
MSG msg;

// Check if we are already running to prevent crossing over items in the listbox
if (running) return;
running = true;

// Load DLL
if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
}

// Replace m_lstResult with the name given to a variable assigned to your list box control for the results
```

```
 listBox = &m_lstResult;

 // Clear out any existing items in the list
 listBox->ResetContent();

 // Reset Cancel flag
 cancelFlag = false;

 // Update Data so we can read the search variables
 UpdateData(TRUE);

 // Set the search parameters (look at the other properties of the structure)
 strcpy(details.Organisation, m_txtSearchOrganisation);
 strcpy(details.Property, m_txtSearchProperty);
 strcpy(details.Street, m_txtSearchStreet);
 strcpy(details.Locality, m_txtSearchLocality);
 strcpy(details.Town, m_txtSearchTown);
 strcpy(details.Postcode, m_txtSearchPostcode);

 // Carry out the search (no need to alter the line below, unless you want to add a sector skip option - see
constants)
 retVal = (afdData)(afdFieldSpec, AFD_SEARCH, (char*)&details);

 // Abort with Message if error or user cancelled
 if (retVal < 0) {
  if (retVal != 99) { // User Cancelled
   AFDErrorText(retVal, msgTxt);
   MessageBox(msgTxt, "Error", 0);
   return;
  }
  running = false;
  return;
 }

 // Now add matching records to the list box
 while (retVal >= 0) {
  if (retVal != AFD_RECORD_BREAK) {
   // make up list item with hidden key at the end
   strncpy(listItem, details.List, sizeof(details.List));
   strncpy(listItem + sizeof(details.List), details.Key, sizeof(details.Key));
   listItem[sizeof(details.List) + sizeof(details.Key)] = '\0';
   // Add the item to the list box
   listBox->AddString(listItem);
  }
  // Give user the chance to cancel and allow list box to update
  if(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)) {
   TranslateMessage(&msg);
   DispatchMessage(&msg);
  }
  // Check if user cancelled
  if (cancelFlag) {
   MessageBox("Search Cancelled", "Cancelled", 0);
   return;
  }
  retVal = (afdData)(afdFieldSpec, AFD_GET_NEXT + AFD_SEARCH, (char*)&details);
 }
```

```
// Check results have been returned
if (listBox->GetCount() == 0)
  MessageBox("No Results Found", "Error", 0);
else {
  listBox->SetCurSel(0); // Select First item in the list

  OnSelchangeLstResult(); // Set this to your list change method to simulate selecting the first list item

}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;

running = false;
```

4.4. List Fetch Function

Unless you are using the DLL's internal list box (i.e., specified the AFD_LIST_BOX constant at the time of your lookup or search) you may well have added each of the results from a lookup or search to a list box from which the user will select the required result. To retrieve the record, they select you should use the Key Field which will have been returned with each result, and which you should have stored with the list items.

To fetch the record, you will first need to declare an instance of the AFD structure you have declared in your general declarations module or class (see Section 4.1). You should then set the Key Field to the value returned for the list item the user has selected.

If you are using International data, you should also set the CountryISO or Country field to specify the country to carry out the lookup for.

You then call the AFDData function with the following three parameters:

1. The Field Specification String (as detailed in Section 4.1)
2. The operation code (AFD_RETRIEVE_RECORD constant)
3. The instance of the structure or type that you declared.

The AFDData function will return a negative value (less than zero) in the case of an error. It is unlikely that an error will occur at this stage, unless your key was in some way corrupted, but for completeness you can use the

AFDErrorText function to help you obtain a string which can be useful for displaying to the user to describe the error.

You will now have the requested record and can use any of the fields in the structure to display or otherwise process the record details as desired.

You should note that with Nearest and the Multiple Fastfind Lookup operation if a location is returned you will obtain a Key starting "LOC:" followed by a grid reference. This should be looked up as a new lookup to get the Nearest results rather than retrieving a record.

Example VB code to fetch an item selected in the list for Address Management products:

```
 Dim details As AFDAddressData
 Dim pos As Long, retVal As Long

 ' Replace lstResult with the name of your list box for the results
 With lstResult

 ' Check a valid item is selected
 If .ListIndex = -1 Then
   MsgBox "No Item Selected"
   Exit Sub
 End If

 ' Set DLL parameters to retrieve the selected record
 details.Key = Mid(lstResult, 513) ' Replace lstResult with the name of your list box for the results

 ' Finished with the list box
 End With

 ' Carry out the lookup (no need to alter the line below, unless you want to add a sector skip option - see
constants)
 retVal = AFDData(afdFieldSpec, AFD_RETRIEVE_RECORD, details)

 ' Abort with Message if error or user cancelled
 If retVal < 0 Then
   MsgBox AFDErrorText(retVal)
   Exit Sub
 End If

 ' Now Assign required fields to your application
 ' These are any of the members of the details. type (Use Trim to remove whitespace)
 txtName.Text = Trim(details.Name)
 txtOrganisation.Text = Trim(details.Organisation)
 txtProperty.Text = Trim(details.Property)
 txtStreet.Text = Trim(details.Street)
 txtLocality.Text = Trim(details.Locality)
 txtTown.Text = Trim(details.Town)
 txtPostcode.Text = Trim(details.Postcode)
```

Example C++ code to fetch an item selected in the list for Address Management products (Visual C++):

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
afdAddressData details;
bool foundSel = false;
long retVal;
CListBox* listBox;
char lstStr[2055];
char msgTxt[255];

// Load DLL
if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
}

// Replace m_lstResult with the name given to a variable assigned to your list box control for the results
listBox = &m_lstResult;

// Set DLL parameters to retrieve the selected record
listBox->GetText(listBox->GetCurSel(), lstStr);
strncpy(details.Key, lstStr + sizeof(details.List), sizeof(details.Key));

// Carry out the lookup (no need to alter the line below, unless you want to add a sector skip option - see
constants)
retVal = (afdData)(afdFieldSpec, AFD_RETRIEVE_RECORD, (char*)&details);

// Abort with Message if error
if (retVal < 0) {
  AFDErrorText(retVal, msgTxt);
  MessageBox(msgTxt, "Error", 0);
  return;
}

// Now Assign required fields to your application
// These are any of the members of the details. structure
m_txtName = details.Name;
m_txtOrganisation = details.Organisation;
m_txtProperty = details.Property;
m_txtStreet = details.Street;
m_txtLocality = details.Locality;
m_txtTown = details.Town;
m_txtPostcode = details.Postcode;
// Update Fields

UpdateData(FALSE);

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

4.5. Account Number Validation – BankFinder Only

This function provides the ability to validate a sort code and account number. This checks that the account number is valid for the branch of the bank which the sortcode belongs to. This does not guarantee that the account number exists, or sufficient funds exist for any transaction, but greatly cuts down on errors due to incorrectly entered numbers. The function will also translate any non-standard account numbers (e.g., a 10-digit account number).

To carry out a validation, you will first need to declare an instance of the AFDBankData structure you have declared in your general declarations module or class (see Section 4.1). You should then set the SortCode and AccountNumber Fields to the sort code and account number that you wish to validate (or instead the IBAN if validating an account number in that International standardised format). Optionally with Building Society credits you may also require a Roll Number.

You then call the AFDData function with the following three parameters:

1. The Field Specification String (as detailed in Section 4.1)
2. The operation code (AFD_ACCOUNT_VALIDATE constant)
3. The instance of the structure or type that you declared.

If you would prefer the DLL to display any error message that may occur to the user, rather than having to display this yourself, you should add the AFD_SHOW_ERROR constant to the operation parameter. This is only suitable for desktop applications as it displays any error message on-screen.

You may also need to add the clearing system you wish to restrict records to as well. Using AFD_UK_CLEARING restricts records to those on the UK (BACS) clearing system only. Using AFD_IRISH_CLEARING restricts records to those on the Irish (IPSO) clearing system only. If you can only clear through the UK system it is important to use the AFD_UK_CLEARING constant.

The AFDData function will return a negative value (less than zero) in the case of an error. Unless you have used the AFD_SHOW_ERROR option to ask the

DLL to present any error to the user, you should display an error for the user before aborting the lookup. The AFDErrorText function will help you obtain a string which can be useful for displaying to the user to describe the error.

Otherwise, the account number is valid, and you should use the SortCode, AccountNumber and TypeOfAccount fields returned in the supplied type or structure instance to process the account number (and optionally roll number with some building societies) as they may be updated should account number translation have been necessary.

If the return value is AFD_SUCCESS then the account number has been validated, if the return value is AFD_SUCCESS_NO_VALIDATION then account numbers on this sortcode cannot be validated and so the number should still be treated as valid. This return code is provided so you can carry out an additional check on the account number, e.g., asking a customer on the phone to repeat it, checking it has been entered from a paper form correctly etc. if you wish to do so.

If you are processing account numbers on both clearing systems and wish to check which one the branch at which the account number that was entered resides on, you can do this by checking the value of the ClearingSystem field:

Clearing System Field Value	**Meaning**
United Kingdom (BACS)	The branch at which this account is held is on the UK clearing system
Ireland (IPSO)	The branch at which this account is held is on the Irish Payment Services Organisation Clearing System
Both UK and Irish	The branch at which this account is held is on both the UK and Irish clearing systems. The actual account may only clear through one of these systems but it is not possible to determine which one so you should clarify that with the customer.

Should you also wish to check the branch details match those that the customer has supplied, check the transaction types allowed at this branch, or obtain the address to use for this branch (may not be the branch physical location) then you can carry out a lookup for the sortcode (see Section 4.1) to obtain the branch information.

Example VB code to validate an account number:

```
 Dim details As AFDBankData
 Dim retVal As Long

 ' Set the Sort Code and Account Number
 details.SortCode = txtValidateSortcode.Text ' Change txtValidateSortCode to your sortcode entry textbox
 details.AccountNumber = txtValidateAccountNo.Text ' Change txtValidateAccountNo to your account number
entry textbox

 ' Carry out the validation (you can change the AFD_BOTH_CLEARINGS option to AFD_UK_CLEARING or
AFD_IRISH_CLEARING as desired)
 retVal = AFDData(afdBankFieldSpec, AFD_ACCOUNT_VALIDATE + AFD_BOTH_CLEARINGS, details)

 ' Abort with Message if error
 If retVal < 0 Then
  MsgBox AFDErrorText(retVal)
  Exit Sub
 End If

 ' Display validation result - with details to submit for payment - note non-standard account number's will be
translated
 MsgBox "Account Number Valid: " + vbCrLf + vbCrLf + "Sortcode: " + Trim(details.SortCode) + vbCrLf + "Account
Number: " + Trim(details.AccountNumber) + vbCrLf + "Type of Account Code: " + Trim(details.TypeOfAccount) +
vbCrLf + "Clearing System: " + Trim(details.ClearingSystem)
```

Example C++ code to validate an account number (Visual C++):

```
 HINSTANCE afdDLL = (HINSTANCE)NULL;
 AFDDATA afdData = (AFDDATA)NULL;
 afdBankData details;
 char msgTxt[255];
 long retVal;
 // Load DLL
 if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
 }

 // Update Data so we can read the sortcode and account number variables
 UpdateData(TRUE);

 // Set the Sort Code and Account Number
 strcpy(details.SortCode, m_txtValidateSortcode); // Change this to your sort code textbox value variable
 strcpy(details.AccountNumber, m_txtValidateAccountNo); // Change this to your account number textbox
value variable

 // Carry out the validation (you can change the AFD_BOTH_CLEARINGS option to AFD_UK_CLEARING or
AFD_IRISH_CLEARING as desired)
 retVal = (afdData)(afdBankFieldSpec, AFD_ACCOUNT_VALIDATE + AFD_BOTH_CLEARINGS, (char*)&details);

 // Abort with Message if error or user cancelled
 if (retVal < 0) {
  AFDErrorText(retVal, msgTxt);
  MessageBox(msgTxt, "Error", 0);
```

```
    return;
  }

  // Display validation result - with details to submit for payment - note non-standard account number's will be
translated
  strcpy(msgTxt, "Account Number Valid:\n\nSortcode: ");
  strcat(msgTxt, details.SortCode);
  strcat(msgTxt, "\nAccount Number: ");
  strcat(msgTxt, details.AccountNumber);
  strcat(msgTxt, "\nType of Account Code: ");
  strcat(msgTxt, details.TypeOfAccount);
  strcat(msgTxt, "\nClearing System: ");
  strcat(msgTxt, details.ClearingSystem);
  MessageBox(msgTxt, "Validation Successful", 0);

  // free DLL instance
  FreeLibrary(afdDLL);
  afdDLL = (HINSTANCE)NULL;
```

4.6. Card Number Validation – BankFinder Only

This function provides the ability to validate a card number, and optionally check that an expiry date indicates that the card is in-date. This checks that the card number is a valid one for the type of card and can indicate the card type. This does not guarantee that the card exists or that a transaction will be authorized, but greatly cuts down on errors due to incorrectly entered numbers.

To carry out a validation, you will first need to declare an instance of the AFDBankData structure you have declared in your general declarations module or class (see Section 4.1). You should then set the CardNumber and, if you wish, the ExpiryDate Fields for the card that you wish to validate.

You then call the AFDData function with the following three parameters:

1. The Field Specification String (as detailed in Section 4.1)
2. The operation code (AFD_CARD_VALIDATE constant)
3. The instance of the structure or type that you declared.

If you would prefer the DLL to display any error message that may occur to the user, rather than having to display this yourself, you should add the AFD_SHOW_ERROR constant to the operation parameter. This is only suitable for desktop applications as it displays any error message on-screen.

The AFDData function will return a negative value (less than zero) in the case of an error. Unless you have used the AFD_SHOW_ERROR option to ask the DLL to present any error to the user, you should display an error for the user before aborting the lookup. The AFDErrorText function will help you obtain a string which can be useful for displaying to the user to describe the error.

Otherwise, the card number is valid. If you wish to determine the card type, the CardType field will hold this information.

Example VB code to validate a card number:

```
 Dim details As AFDBankData
 Dim retVal As Long

 ' Set the Card Number and Expiry Date (Optional)
 details.CardNumber = txtValidateCardNo.Text ' Change txtValidateCardNo to your card number entry textbox
 details.ExpiryDate = txtValidateExpiry.Text ' Change txtValidateExpiry to your expiry date entry textbox

 ' Carry out the validation (you can change the AFD_BOTH_CLEARINGS option to AFD_UK_CLEARING or
AFD_IRISH_CLEARING as desired)
 retVal = AFDData(afdBankFieldSpec, AFD_CARD_VALIDATE, details)

 ' Abort with Message if error
 If retVal < 0 Then
   MsgBox AFDErrorText(retVal)
   Exit Sub
 End If

 ' Display validation result
 MsgBox "Card Valid: " + Trim(details.CardType)
```

Example C++ code to validate a card number (Visual C++):

```
 HINSTANCE afdDLL = (HINSTANCE)NULL;
 AFDDATA afdData = (AFDDATA)NULL;
 afdBankData details;
 char msgTxt[255];
 long retVal;
 // Load DLL
 if (!afdInitDLL(&afdDLL, &afdData)) {
   MessageBox("Error Loading afddata.dll", "Error", 0);
   return;
 }

 // Update Data so we can read the card number and expiry date variables
 UpdateData(TRUE);

 // Set the Card Number and Expiry date (Optional)
 strcpy(details.CardNumber, m_txtValidateCardNo); // Change this to your card number textbox value variable
 strcpy(details.ExpiryDate, m_txtValidateExpiry); // Change this to your expiry date textbox value variable
```

```
// Carry out the validation (no need to alter the line below)
retVal = (afdData)(afdBankFieldSpec, AFD_CARD_VALIDATE, (char*)&details);

// Abort with Message if error or user cancelled
if (retVal < 0) {
  AFDErrorText(retVal, msgTxt);
  MessageBox(msgTxt, "Error", 0);
  return;
}

// Display validation result
strcpy(msgTxt, "Card Valid: ");
strcat(msgTxt, details.CardType);
MessageBox(msgTxt, "Validation Successful", 0);

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

4.7. List Functions – Address Management Only

With Postcode Plus, Names & Numbers and TraceMaster products you can use the list functions to obtain a list of alias localities for the postcode sector that a postcode or result is contained in. These are non-postally required localities held by Royal Mail which can or may be included on an address if desired. An example of this would be including Wimbledon for an address in London. You should note that these are stored at postal sector level (e.g., SW19 1) and there are often multiple entries for an address so a locality being returned does not mean it is necessarily the best one for the particular address you are viewing.

For Names & Numbers and TraceMaster products only it is also possible to obtain a list of possible values for most fields, e.g., all the Mailsort codes present, business descriptions, etc. You can also specify the start value of the field, e.g. return all surnames present starting with "Smith".

When using International data, you can also use the List functions to obtain a list of all available countries (names or ISO codes).

To carry out a list operation, you first need to declare an instance of the AFDListData structure you have declared in your general declarations module or class (see Section 4.1). For an alias locality lookup, you should then set the Lookup field to the postcode or record key that you wish to lookup the alias localities for. When retrieving field lists from Names &

Numbers you can set this to specify that only entries starting with your specified string are returned (this is essential for long lists like surname to be useful but is generally not so useful with shorter lists like Household Composition).

The operation parameter passed to the AFDData function determines the List function carried out:

Constant	**Description**
AFD_LIST_ALIAS_LOCALITY	Returns all alias localities for the sector that the specified postcode or key resides in.
The following are applicable when using International data only:	
AFD_LIST_COUNTRY_ISO	Will return the ISO codes of all available countries.
AFD_LIST_COUNTRY	Will return the names of all available countries.
The following are applicable to Names & Numbers and TraceMaster Products Only: These all return a list of all entries of the data item specified in the data Setting the lookup parameter will restrict matches to only those items starting with the specified string.	
AFD_LIST_FORENAME	Returns Forenames (first names).
AFD_LIST_SURNAME	Returns Surnames
AFD_LIST_ORGANISATION	Returns Organisations
AFD_LIST_PROPERTY	Returns Properties
AFD_LIST_STREET	Returns Streets
AFD_LIST_LOCALITY	Returns Localities
AFD_LIST_TOWN	Returns Postal Towns
AFD_LIST_COUNTY	Returns Counties (This includes Postal, Traditional and Administrative County names)
AFD_LIST_MAILSORT_CODE	Returns Mailsort codes
AFD_LIST_URBAN_RURAL_CODE	Returns Urban Rural Codes
AFD_LIST_URBAN_RURAL_NAME	Returns Urban Rural Names
AFD_LIST_WARD_CODE	Returns Ward Codes
AFD_LIST_WARD_NAME	Returns Ward Names
AFD_LIST_CONSTITUENCY	Returns Constituencies
AFD_LIST_EER_CODE	Returns EER Codes (European Electoral Region Codes)
AFD_LIST_EER_NAME	Returns EER Names
AFD_LIST_AUTHORITY_CODE	Returns Local / Unitary Authority Codes
AFD_LIST_AUTHORITY	Returns Authority Names

AFD_LIST_LEA_CODE	Returns LEA Codes (Local Education Authority)
AFD_LIST_LEA_NAME	Returns LEA Names
AFD_LIST_TV_REGION	Returns TV Regions
AFD_LIST_NHS_CODE	Returns NHS Codes
AFD_LIST_NHS_NAME	Returns NHS Names
AFD_LIST_NHS_REGION_CODE	Returns NHS Region Codes
AFD_LIST_NHS_REGION_NAME	Returns NHS Region Names
AFD_LIST_PCT_CODE	Return PCT Codes
AFD_LIST_PCT_NAME	Return PCT Names
AFD_LIST_CENSATION_CODE	Returns Censation Codes
AFD_LIST_AFFLUENCE	Returns Censation Affluence Codes with descriptions
AFD_LIST_LIFESTAGE	Returns Censation Lifestage Codes with descriptions
AFD_LIST_ADDITIONAL_CENSUS_INFO	Returns Censation Additional Information with descriptions.
AFD_LIST_HOUSEHOLD_COMPOSITION	Returns Household composition codes with descriptions.
AFD_LIST_BUSINESS	Returns Business descriptions
AFD_LIST_SIZE	Returns Company Size catagories
AFD_LIST_SIC_CODE	Returns SIC Codes
AFD_LIST_COUNCIL_TAX_BAND	Returns Council Tax Bands

You then call the AFDData function with the following three parameters:

1. The List Field Specification String (as detailed in Section 4.1)
2. The operation code (See above for options).
3. The instance of the structure or type that you declared.

If you would prefer not to use your own list box in your application, you may wish to add to the operation constant the AFD_LIST_BOX option. This causes the DLL to display a list box for you returning the record that the user selects, rather than returning all matching list records to your application. This is only suitable for desktop applications as it displays the list box on-screen. Similarly adding AFD_SHOW_ERROR causes the DLL to display any error message to the user itself.

The AFDData function will return AFD_SUCCESS for most operations or AFD_NO_RESULTS_FOUND if there were no matching list items. Other errors may be returned if the product is not correctly licensed (i.e., AFD_ERROR_OPENING_FILES, AFD_ERROR_FILE_READ, or AFD_DATA_LICENSE_ERROR). So, unless you have used the AFD_SHOW_ERROR option to ask the DLL to present any error to the user, you may wish to call AFDErrorText in these circumstances to obtain a string to display to the user describing the error.

If the return value from the AFDData function is AFD_SUCCESS, then a matching result has been returned and you can access the fields in the structure or type instance supplied to obtain full details for it. The resulting string will be found in the List Field of the structure.

If you have specified the AFD_LIST_BOX option, then the user will have selected the required item and you can access the selected result in the List Field of the structure.

Otherwise, you will have retrieved the first record. To retrieve the rest of the records you should call the AFDData function as above repeatedly with the same operation code as before but adding the AFD_GET_NEXT constant to it to obtain subsequent records. These can be added to a list box as above or processed as required.

***Example VB code for a List operation to retrieve alias localities*:**

```
Dim details As AFDListData
Dim retVal As Long
Static running As Boolean

' Prevent corruption of list box from button being clicked twice
If running Then Exit Sub
running = True

' Replace lstResult with the name of your list box for the results
With lstResult

' Clear out any existing items in the list
.Clear

' Reset Cancel flag
cancelFlag = False

' Set the lookup
details.Lookup = txtLookup.Text ' Change txtLookup to the postcode or record key you wish to lookup

' Carry out the lookup (Can alter the operation to retrieve N&N list items if desired)
retVal = AFDData(afdFieldSpec, AFD_LIST_ALIAS_LOCALITY, details)

' Abort with Message if error or user cancelled
```

```
 If retVal < 0 Then
   MsgBox AFDErrorText(retVal)
   running = False
   Exit Sub
 End If

' Now add matching records to the list box
 Do While retVal >= 0
   ' Add the item to the list box with hidden key at the end
        .AddItem Trim(details.List)
        ' Give user the chance to cancel and allow list box to update
   DoEvents
   ' Check if user cancelled
   If cancelFlag Then
     MsgBox "Lookup Cancelled"
     running = False
     Exit Sub
   End If
   retVal = AFDData(afdFieldSpec, AFD_GET_NEXT + AFD_LIST_ALIAS_LOCALITY, details)
 Loop

 ' Check results have been returned
 If .ListCount = 0 Then
   MsgBox "No Results Found"
 Else
   .ListIndex = 0 ' Select First item in the list
 End If

 End With

 running = False
```

Example C++ Code For an Address Management Lookup (Visual C++)

```
 HINSTANCE afdDLL = (HINSTANCE)NULL;
 AFDDATA afdData = (AFDDATA)NULL;
 static bool running = false;
 afdListData details;
 char listItem[2055];
 char msgTxt[255];
 long retVal;
 CListBox* listBox;
 MSG msg;

 // Check if we are already running to prevent crossing over items in the listbox
 if (running) return;
 running = true;

 // Load DLL
 if (!afdInitDLL(&afdDLL, &afdData)) {
   MessageBox("Error Loading afddata.dll", "Error", 0);
   return;
 }

 // Replace m_lstResult with the name given to a variable assigned to your list box control for the results
 listBox = &m_lstResult;
```

```
// Clear out any existing items in the list
listBox->ResetContent();

// Reset Cancel flag
cancelFlag = false;

// Update Data so we can read the lookup variable
UpdateData(TRUE);

// Set the lookup
strcpy(details.Lookup, m_txtLookup); // Change this to the postcode or record key you wish to lookup

// Carry out the lookup (Can alter the operation to retrieve N&N list items if desired)
retVal = (afdData)(afdFieldSpec, AFD_LIST_ALIAS_LOCALITY, (char*)&details);

// Abort with Message if error or user cancelled
if (retVal < 0) {
  AFDErrorText(retVal, msgTxt);
  MessageBox(msgTxt, "Error", 0);
  running = false;
  return;
}

// Now add matching records to the list box
while (retVal >= 0) {
      // make up list item
      strncpy(listItem, details.List, sizeof(details.List));
  listItem[sizeof(details.List)] = '\0';
  // Add the item to the list box
  listBox->AddString(listItem);
  // Give user the chance to cancel and allow list box to update
  if(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)) {
    TranslateMessage(&msg);
    DispatchMessage(&msg);
  }
  // Check if user cancelled
  if (cancelFlag) {
    MessageBox("Search Cancelled", "Cancelled", 0);
    return;
  }
  retVal = (afdData)(afdFieldSpec, AFD_GET_NEXT + AFD_LIST_ALIAS_LOCALITY, (char*)&details);
}

// Check results have been returned
if (listBox->GetCount() == 0)
  MessageBox("No Results Found", "Error", 0);
else {
  listBox->SetCurSel(0); // Select First item in the list

  OnSelchangeLstResult(); // Set this to your list change method to simulate selecting the first list item

}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

```
running = false;
```

4.8. String Utility Functions – Depreciated and Unsupported

These are provided for compatibility with existing applications which may depend on them but for new developments we would recommend you use in-built functions which are included with most modern development environments.

To carry out a string operation, you will first need to declare an instance of the AFDStringData structure you have declared in your general declarations module or class (see Section 4.1). You should then set the Lookup Field to the string that you wish to clean. If you wish to carry out a Search and Replace operation, then you should also set the Search and Replace fields to the appropriate strings.

The operation parameter passed to the AFDData function determines the String operation, which is carried out, and this should be one of the following:

Constant	**Description**
AFD_ STRING_SEARCH_REPLACE	All occurrences in the string specified in the Lookup field of the string specified in the Search field are replaced with the string in the Replace field.
AFD_STRING_SEARCH_REPLACE_CASE	This is the same as AFD_STRING_SEARCH_REPLACE but is case sensitive.
AFD_STRING_CAPITALISE	This corrects the capitalisation of the string specified in the Lookup field. For example, 'commercial STREET' would become 'Commercial Street'.
AFD_STRING_CLEAN_LINE	This cleans the string specified in the Lookup field by removing spurious characters that should not be in an address line, e.g., a trailing comma.
AFD_STRING_CHECK_POSTCODE	This checks if the string specified in the Lookup field looks like a postcode.
AFD_STRING_CLEAN_POSTCODE	This cleans the postcode specified in the Lookup field to tidy up the postcode specified.

AFD_STRING_ABBREVIATE_COUNTY	This provides the Royal Mail Approved county abbreviation for the county specified in the Lookup field if one exists.

You then call the AFDData function with the following three parameters:

4. The String Field Specification String (as detailed in Section 4.1)
5. The operation code (See above for options).
6. The instance of the structure or type that you declared.

The AFDData function will return AFD_SUCCESS for most operations. If you are using AFD_STRING_CLEAN_POSTCODE then AFD_NO_RESULTS_FOUND will be returned if the string does not look like a postcode. For AFD_STRING_ABBREVIATE_COUNTY the constant AFD_NO_RESULTS_FOUND will also be returned if there is no Royal Mail approved abbreviation available for the specified county name.

The resulting string will be found in the Lookup Field of the structure. When using the AFD_STRING_CLEAN_POSTCODE function the Outcode and Incode portions of the postcode (portion before and after the space) will also be avaliable in the separate Outcode and Incode Fields.

***Example VB code for a Search/Replace String Operation*:**

```
Dim details As AFDStringData
Dim retVal as Long

' Set the Lookup, Search and Replace parameters
details.Lookup = txtLookup.Text ' Change txtLookup.Text to your string entry textbox
details.Search = txtSearch.Text ' Change txtSearch.Text to your search entry textbox
details.Replace = txtReplace.Text ' Change txtReplace.Text to your replace textbox

' Carry out the String operation
retVal = AFDData(afdStringFieldSpec, AFD_STRING_SEARCH_REPLACE, details)

' Check if success
If retVal >= 0 Then
  ' details.Lookup holds the updated string
End If
```

Example C++ code for a Search/Replace String Operation (Visual C++):

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
afdStringData details;
long retVal;
// Load DLL
```

```
if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
}

// Update Data so we can read the lookup, search and replace variables
UpdateData(TRUE);

// Set the String to lookup, and the string to Search for and Replace with
strcpy(details.Lookup, m_txtLookup); // Change this to your string textbox value variable
strcpy(details.Search, m_txtSearch); // Change this to your search textbox value variable
strcpy(details.Replace, m_txtReplace); // Change this to your replace textbox value variable

// Carry out the String operation
retVal = (afdData)(afdStringFieldSpec, AFD_STRING_SEARCH_REPLACE, (char*)&details);

// Check if success
if (retVal >= 0) {
  // details.Lookup holds the updated string
}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

4.9. Grid Utility Functions – UK Address Management Only

These functions are used to carry out operations related to grid references and latitude and longitude values. You can convert between GB and Irish based grid references and also convert to and from latitude and longitude values. The facility to convert a value in kilometers to miles and vice-versa, return an approximate grid reference for a location and also calculate the distance between two geographical locations is also included.

To carry out a grid operation, you will first need to declare an instance of the AFDGridData structure you have declared in your general declarations module or class (see Section 4.1).

The operation parameter passed to the AFDData function determines the String operation, which is carried out, and this should be one of the following:

Constant	**Value**	**Description**
AFD_GRID_CONVERT	512	Converts a GB or NI based grid reference, or latitude and longitude value to all other grid reference types and latitude and longitude values. You should set the location in the Fields of your structure or

		type instance, for example set the GBGridE and GBGridN fields and the function will return the NIGridE and NIGridN variants along with the latitude and longitude values etc. (This uses a 1m resolution (6 digit). Using a constant of 0 rather than 512 uses 5 digit grids).
AFD_GRID_LOOKUP_LOCATION	513	Looks up a town, locality, or partial postcode specified in the Lookup field and provides an approximate grid reference and latitude and longitude values for the location if a match is found. Can return multiple records if the location is ambiguous. (This uses a 1m resolution (6 digit). Using a constant of 1 rather than 513 uses 5 digit grids).
AFD_GRID_DISTANCE	514	Calculates the distance between a pair of grid references or latitude and longitude values specified. You will need to set a grid or latitude and longitude value in both the normal fields and those prefixed with "From" to find the distance in both Miles and Km. (This uses a 1m resolution (6 digit). Using a constant of 2 rather than 514 uses 5 digit grids).

You then call the AFDData function with the following three parameters:

1. The Grid Field Specification String (as detailed in Section 4.1)
2. The operation code (See above for options).
3. The instance of the structure or type that you declared.

The AFDData function will return AFD_SUCCESS on success. If the operation fails, for example a location looked up does not exist or a grid reference specified is out of range then AFD_NO_RESULTS_FOUND will be returned.

You can then read the resulting grid reference, latitude and longitude values, or Km and Miles values as appropriate for the operation you have carried out and the data that you require.

Example VB code for converting a GB based grid reference:

```
Dim details As AFDGridData
Dim retVal as Long

' Set the GBGridE and GBGridN parameters
details.GBGridE = "406600" ' Change 406600 to the grid easting value you wish to convert
details.GBGridN = "286500" ' Change 286500 to the grid northing value you wish to convert

' Carry out the Grid operation
retVal = AFDData(afdGridFieldSpec, AFD_GRID_CONVERT, details)

' Check if success
If retVal >= 0 Then
  ' Other elements of details hold converted values, e.g. Latitude and Longitude
End If
```

Example C++ code for converting a GB based grid reference (Visual C++):

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
afdGridData details;
long retVal;
// Load DLL
if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
}

// Set the GBGridE and GBGridN parameters
strcpy(details.GBGridE, "406600"); // Change 406600 to the grid easting value you wish to convert
strcpy(details.GBGridN, "286500"); // Change 286500 to the grid northing value you wish to convert

// Carry out the Grid operation
retVal = (afdData)(afdGridFieldSpec, AFD_GRID_CONVERT, (char*)&details);

// Check if success
if (retVal >= 0) {
  // Other elements of details hold converted values, e.g. Latitude and Longitude
}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

4.10. Email Utility Function

This function is used to carry out validation of an email address. This verifies that the address is in the correct format for an email address and also that the domain exists to help minimise errors in data entry.

To carry out an email operation, you will first need to declare an instance of the AFDEmailData structure you have declared in your general declarations module or class (see Section 4.1).

The operation parameter passed to the AFDData function determines the level of validation, which is carried out, and this should be one of the following:

Constant	**Value**	**Description**
AFD_EMAIL_FULL	0	Full email validation including live domain lookup
AFD_EMAIL_FORMAT	2	Validate email addres format is correct only
AFD_EMAIL_TLD	3	Validate email format is correct and the top-level domain exists
AFD_EMAIL_LOCAL	4	Validate email format, top level domain and for well-known domains carry out additional checks of the local portion of the address

You then call the AFDData function with the following three parameters:

4. The Email Field Specification String (as detailed in Section 4.1)
5. The operation code (See above for options).
6. The instance of the structure or type that you declared.

The AFDData function will return AFD_SUCCESS on success. If the operation fails, for example the email address format is not valid, then AFD_NO_RESULTS_FOUND will be returned.

Example VB code for validating an email address:

```
Dim details As AFDEmailData
Dim retVal as Long

' Set the Email parameter
details.Email = "support@afd.co.uk" ' Change support@afd.co.uk to the email address you wish to validate

' Carry out the Email operation
retVal = AFDData(afdEmailFieldSpec, AFD_EMAIL_FULL, details)

' Check if success
If retVal >= 0 Then
  ' Email address is valid
End If
```

Example C++ code for validating an email address (Visual C++):

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
afdEmailData details;
```

```
 long retVal;
 // Load DLL
 if (!afdInitDLL(&afdDLL, &afdData)) {
   MessageBox("Error Loading afddata.dll", "Error", 0);
   return;
 }

 // Set the GBGridE and GBGridN parameters
 strcpy(details.Email, "support@afd.co.uk"); // Change support@afd.co.uk to the email address you wish to
validate

 // Carry out the Email operation
 retVal = (afdData)(afdEmailFieldSpec, AFD_GRID_CONVERT, (char*)&details);

 // Check if success
 if (retVal >= 0) {
   // Email Address is Valid
 }

 // free DLL instance
 FreeLibrary(afdDLL);
 afdDLL = (HINSTANCE)NULL;
```

4.11. Clean Function – UK Address Management Only

Requires a Refiner API License

The clean function allows an address, for example from a database, to be cleaned, i.e., where possible matched to Postcode Plus and therefore given a correct deliverable address.

To clean an address will first need to declare an instance of the AFD structure you have declared in your general declarations module or class.

You will then need to set address fields in your structure to specifiy the address to be cleaned. These do not need to match up to the actual fields, for example if you have Address Line 1, Address Line 2, Address Line 3, and Postcode in your database you could set these to Property, Street, Locality and Postcode fields in the structure and they will be cleaned and returned in the correct named fields when matched. Note that if you set any non-address fields they will be ignored (Please see Appendix G for the list of fields that Refiner will use).

You then call the AFDData function with the following three parameters:

4. The Field Specification String (as detailed in Section 4.1)

5. The operation code (AFD_CLEAN constant)
6. The instance of the structure or type that you declared.

The AFDData function will return a negative value (less than zero) in the case where an address cannot be fully matched. This could be because the address was unmatchable, International, or an ambiguous result was found (see Section 4.1.9 for details of these return codes). An address will still be returned as this will include the address with Field Placement correction which you can use if you desire.

Where the function returns a positive value (greater than zero) this means that the address has been uniquely matched. You may still like to examine the return value as this will give details as to the level to which the address was matched (see Section 4.1.9 for details of these return codes). Many other fields are also avaliable with additional (non-address data) which you may require.

In the case of an ambiguous or suggested result (return code is -102, -103, or -104) the first address returned from the function will be the original address with field placement. For non-batch processes you may wish to present a list of addresses for the user to choose from and in this case, you can continue to call the AFDData function as above repeatedly with the same operation code as before but adding the AFD_GET_NEXT constant to it to obtain subsequent records. These can be added to a list box as above or processed as required. You should call AFDData in a lookup to retrieve these records allowing the user to cancel the lookup should it take some time, or they realise they have entered something incorrectly.

Example VB code to clean an Address:

```
 Dim details As AFDAddressData
 Dim retVal as Long

 ' Replace lstResult with the name of your list box if you wish to display ambiguous results
 With lstResult

 ' Clear out any existing items in the list
 .Clear

 ' Clear Structure
 ClearAFDAddressData details

 ' Set the fields to specify the address that you wish to clean
```

```
  details.Organisation = txtSearchOrganisation.Text
  details.Property = txtSearchProperty.Text
  details.Street = txtSearchStreet.Text
  details.Locality = txtSearchLocality.Text
  details.Town = txtSearchTown.Text
  details.Postcode = txtSearchPostcode.Text

  ' Clean the Address
  retVal = AFDData(afdFieldSpec, AFD_CLEAN, details)

  ' Show the resulting address
  ' These are any of the members of the details. type (Use Trim to remove whitespace)
  txtName.Text = Trim(details.Name)
  txtOrganisation.Text = Trim(details.Organisation)
  txtProperty.Text = Trim(details.Property)
  txtStreet.Text = Trim(details.Street)
  txtLocality.Text = Trim(details.Locality)
  txtTown.Text = Trim(details.Town)
  txtPostcode.Text = Trim(details.Postcode)

  ' Show Cleaning Status
  Msgbox AFDRefinerCleaningText(retVal)

  ' If ambiguous then add matching records to the list box for user selection
  '  - This is optional and not normally useful for batch processes
  If retVal = AFD_REFINER_AMBIGUOUS_POSTCODE Or retVal = AFD_REFINER_AMBIGUOUS_MATCH Or retVal =
AFD_REFINER_SUGGEST_RECORD Then
    Do While retVal <> AFD_ERROR_END_OF_SEARCH
      ' Add the item to the list box with hidden key at the end
      .AddItem details.List + details.Key
      retVal = AFDData(afdFieldSpec, AFD_GET_NEXT  + AFD_CLEAN, details)
    Loop

  End If

  End With
```

Example C++ Code to clean an address (Visual C++)

```
  HINSTANCE afdDLL = (HINSTANCE)NULL;
  AFDDATA afdData = (AFDDATA)NULL;
  afdAddressData details;
  char listItem[2055];
  char msgTxt[255];
  long retVal;
  CListBox* listBox;

  // Load DLL
  if (!afdInitDLL(&afdDLL, &afdData)) {
    MessageBox("Error Loading afddata.dll", "Error", 0);
    return;
  }

  // Replace lstResult with the name of your list box if you wish to display ambiguous results
  listBox = &m_lstResult;

  // Clear out any existing items in the list
```

```
listBox->ResetContent();

// Update Data so we can read the search variables
UpdateData(TRUE);

// Set the fields to specify the address that you wish to clean
strcpy(details.Organisation, m_txtSearchOrganisation);
strcpy(details.Property, m_txtSearchProperty);
strcpy(details.Street, m_txtSearchStreet);
strcpy(details.Locality, m_txtSearchLocality);
strcpy(details.Town, m_txtSearchTown);
strcpy(details.Postcode, m_txtSearchPostcode);

// Clean the Address
retVal = (afdData)(afdFieldSpec, AFD_CLEAN, (char*)&details);

// Show the resulting address
// These are any of the members of the details. structure
m_txtName = details.Name;
m_txtOrganisation = details.Organisation;
m_txtProperty = details.Property;
m_txtStreet = details.Street;
m_txtLocality = details.Locality;
m_txtTown = details.Town;
m_txtPostcode = details.Postcode;

// Update Fields
UpdateData(FALSE);

// Show Cleaning Status
AFDRefinerCleaningText(retVal, msgTxt);
MessageBox(msgTxt, "Cleaning Status", 0);

// If ambigious then add matching records to the list box for user selection
//  - This is optional and not normally useful for batch processes
if ((retVal == AFD_REFINER_AMBIGUOUS_POSTCODE) || (retVal == AFD_REFINER_AMBIGUOUS_MATCH) || (retVal
== AFD_REFINER_SUGGEST_RECORD)) {
  while (retVal != AFD_ERROR_END_OF_SEARCH) {
    // make up list item with hidden key at the end
    strncpy(listItem, details.List, sizeof(details.List));
    strncpy(listItem + sizeof(details.List), details.Key, sizeof(details.Key));
    listItem[sizeof(details.List) + sizeof(details.Key)] = '\0';
    // Add the item to the list box
    listBox->AddString(listItem);
    retVal = (afdData)(afdFieldSpec, AFD_GET_NEXT + AFD_CLEAN, (char*)&details);
  }
}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

5. The Code Explained (PostcodeEverywhere XML)

5.1. General Declarations

This provides a set of constants which provide the server name, serial number, password and userid which are to be used with the server. These can be modified to suit your needs and are required by all functions which contact the XML server.

You might prefer to read these settings from the registry or a configuration file if you want them to be user configurable or easily changed later.

These constants are as follows:

AFD_SERVER
Provides the start of the URL for the Postcode Everywhere Server. For example, if you are using our hosted service this should be http://pce.afd.co.uk. If you are using your own server then this should be set to the server name as it would be accessible from any client using it. This should include the port if it is running on, if it is not port 80, for example http://myserver:81.

AFD_SERIAL_NUMBER
Provides the serial number required if you are using our hosted service (pce.afd.co.uk). This will have been supplied on your license certificate you will have received when you purchased your license to use the service. This is not required if you are using your own server, however you may wish to leave the constant defined as an empty string so you can easily change your application to work the other way later if required.

AFD_PASSWORD
Provides your password to the service which is required if you are using our hosted service.

AFD_USER_ID
This is an optional setting but is useful for allowing the user or application using the service to be identified and can be used with either the hosted service or your own PostcodeEverywhere server.

5.2. Calling the PostcodeEverywhere XML Server

All calls to the PostcodeEverywhere XML server follow the same basic structure. The parameters that make up each call to the server can either be specified as parameters in the URL string, separated by ampersands i.e., using GET functionality, or can be sent to the server as a POST. Note that in the case of Internet applications we strongly recommend that you have calls to the service running server-side with the code inaccessible to end-users to prevent abuse of the service, and in the case of the hosted service to protect your serial number and password.

The URL for PCE requests is AFD_SERVER + "/afddata.pce". For example, http://pce.afd.co.uk/afddata.pce" would be our hosted server URL for Common-API requests.

The parameters usually supplied are then as follows:

Serial	AFD_SERIAL
Password	AFD_PASSWORD
UserID	AFD_USER_ID
Data	Specifies the data you are using (see section 5.2.1 below)
Task	Specifies the task to carry out (see section 5.2.2 below)
Fields:	Specifies the fields to use (see section 5.2.3 below)
MaxQuantity	Specifies the maximum number of records to return

These are then followed by function specific parameters, for example if you are carrying out a Lookup you would use the lookup parameter to specify the field to lookup.

Note that the Serial and Password parameters are not necessary if you are not using our hosted service, but you may wish to leave these in to allow future flexibility. The UserID and MaxQuantity settings are also optional, however if not specified a maximum quantity of 100 results will be assumed.

You should note that regardless of the maximum quantity setting there is a timeout setting (default 30 seconds) and a 128-kilobyte buffer limit for the server to retain server responsiveness and prevent buffer overflows. This means that with large quantities of results or slow searches the number of results returned may be less than MaxQuantity. Postcode and WorldAddress also have upper limits of 300 and 1000 results respectively. If you are not obtaining the result you require, you should refine your search to be more specific.

Your then load this XML document in your parser and should check for any error returned by the parser and deal with it appropriately (e.g., displaying the error to the user and aborting).

You can then read the required data from the records returned. The example code generated by the API Wizard shows how to do this for several development environments and you can also see some sample code in section 5.3 onwards of this documentation.

Regardless of the data or operation used, the XML structure will always be in the following format:

```
<AFDPostcodeEverywhere>
  <Result>1</Result>
  <ErrorText />
  <Item value = "1">
     … fields returned
  </Item>
  …
</AFDPostcodeEverywhere>
```

Where:

Result is numeric and either contains an error (value less than 0) or the number of items returned (> 0).

ErrorText contains a description of the error which occurred if the value fo Result is less than 0.

If the function is successful, then the Result code returned is >= 0. The results are contained in Item nodes (this will be one or more if the operation was successful).

5.2.1. The Data Parameter

This is used to specify the type of Data you require and should be one of the following options:

Data Parameter	**Usage**
Address	For all address management products, e.g., Postcode, Postcode Plus, Names & Numbers, TraceMaster, ZipAddress and WorldAddress this is used to lookup and search for addresses.
Bank	Used to lookup or search for Bank data using BankFinder and also for account or card validation.
Nearest	Used to find the Nearest in your database to a specified postcode or location.
List	Used to list the alias localities for any address with Postcode Plus, Names & Numbers and TraceMaster. In Names & Numbers and TraceMaster only, this can also list possible field values for most data fields.
Grid	Provides a range of Grid utility functions useful for obtaining, converting, or calculating distances for grid references.
Email	Provides a utility to validate the format of Email addresses
String – Deprecated	Provides a range of String utility functions sometimes useful for addressing.

5.2.2. The Task Parameter

This is used to specify the specific task that you wish to carry out. The possible values for this depend on the type of data being used (the data parameter) and could be one of the following:

Data Parameter	**Task Parameter**	**Use**
Address	FastFind	To lookup matching addresses quickly from a postcode or search criteria such as "Commercial Street, Birmingham".
	Lookup	To lookup matching addresses quickly from a postcode (or zipcode), e.g., "B11 1AA". Only a full postcode without any property

		information included will yield results.
	PropertyLookup	To lookup matching addresses quickly from a postcode (or zipcode), which may optionally include property information to find a match, e.g., “304, B11 1AA”.
	Search	To search for matching addresses based on specific search criteria.
	Retrieve	To re-retrieve a previous result, for example when selected from a list.
	Clean	To clean an address – requires a Refiner API license.
Bank	FastFind	Used to lookup bank data from a lookup string, for example a sortcode or bank and branch name, e.g., “560036”.
	Search	To search for matching bank records based on specific search criteria.
	Retrieve	To re-retrieve a previous result, for example when selected from a list.
	Account	Used to validate a sort code and account number is valid (that it is a valid number for the bank branch it is held at, which does not guarantee that it exists).
	Card	Used to validate a card number is valid (that it is a valid number for the type of card, not that it actually exists).
Nearest	FastFind	To find the Nearest locations quickly from a postcode, location (e.g., locality or town), grid reference, or latitude and longitude value.
	MultipleFastFind	As above, but where a find string returns multiple possible locations, e.g., Bradford, the user can select the location they require in an additional step to Nearest.
	Lookup	Find the nearest from a postcode, e.g., “B11 1AA”. Only full postcodes will yield results.
	Search	To search for matching records in your database matching the criteria that you search on.

	Retrieve	To re-retrieve a previous result, for example when selected from a list. Uses the primary key to retrieve the record.
List	ListAliasLocality	Returns all alias localities for the sector that the specified postcode or key resides in.
	The following are applicable when using International data only:	
	ListCountryISO	Will return the ISO codes of all available countries.
	ListCountry	Will return the names of all available countries.
	The following are applicable to Names & Numbers and TraceMaster Products Only: These all return a list of all entries of the data item specified in the data. Setting the lookup parameter will restrict matches to only those items starting with the specified string.	
	ListForename	Returns Forenames (first names).
	ListSurname	Returns Surnames
	ListOrganisation	Returns Organisations
	ListProperty	Returns Properties
	ListStreet	Returns Streets
	ListLocality	Returns Localities
	ListTown	Returns Postal Towns
	ListCounty	Returns Counties (This includes Postal, Traditional and Administrative County names)
	ListMailsortCode	Returns Mailsort codes
	ListUrbanRuralCode	Returns Urban Rural Codes
	ListUrbanRuralName	Returns Urban Rural Names
	ListWardCode	Returns Ward Codes
	ListWardName	Returns Ward Names
	ListConstituency	Returns Constituencies
	ListEERCode	Returns EER Codes (European Electoral Region Codes)
	ListEERName	Returns EER Names
	ListAuthorityCode	Returns Local / Unitary Authority Codes
	ListAuthority	Returns Authority Names
	ListLEACode	Returns LEA Codes (Local Education Authority)
	ListLEAName	Returns LEA Names
	ListTVRegion	Returns TV Regions
	ListNHSCode	Returns NHS Codes

	ListNHSName	Returns NHS Names
	ListNHSRegionCode	Returns NHS Region Codes
	ListNHSRegionName	Returns NHS Region Names
	ListPCTCode	Return CCG Codes
	ListPCTName	Return CCG Names
	ListCensationCode	Returns Censation Codes
	ListAffluence	Returns Censation Affluence Codes with descriptions
	ListLifestage	Returns Censation Lifestage Codes with descriptions
	ListAdditionalCensusInfo	Returns Censation Additional Information with descriptions.
	ListHouseholdComposition	Returns Household composition codes with descriptions.
	ListBusiness	Returns Business descriptions
	ListSize	Returns Company Size catagories
	ListSIC	Returns SIC Codes
	ListCouncilTaxBand	Returns Council Tax Bands
	ListConstituencyCode	Returns Constituency Codes
	ListSubCountryName	Returns Sub Country Names
	ListDevolvedConstituencyCode	Returns Devolved Contituency Codes
	ListDevolvedConstituencyName	Returns Devolved Cnstituency Name
String - Depreciated	*SearchReplace*	*Replaces instances of x with y in the supplied string.*
	SearchReplaceCase	*A case-sensitive version of SearchReplace*
	Capitalise	*Corrects capitalisation of the string as appropriate for address fields, e.g. “COMMerCIAL street” becomes “Commercial Street”*
	CleanLine	*Cleans an address line, removing spurious characters*
	CheckPostcode	*Checks if a postcode is in a valid format.*
	CleanPostcode	*Cleans common errors in a postcode, e.g. “B11 IAA” would be changed to “B11 1AA”.*
	AbbreviateCounty	*Returns the Royal Mail approved abbreviation (if one exists) for the supplied County name, e.g. “Oxfordshire” becomes “Oxon”.*
Grid	Convert1m	Used to convert a grid reference to latitude and longitude (or vice-versa), a grid reference on the Irish

		Grid to the GB grid (or vice-versa). Returns 1m resolution grids.
	LookupLocation1m	Enables a grid reference to be looked up for a specified locality or town. Returns 1m resolution grids.
	Distance1m	Calculates the distance between two grid references or latitude and longitude values. Returns 1m resolution grids.
	Convert	Used to convert a grid reference to latitude and longitude (or vice-versa), a grid reference on the Irish Grid to the GB grid (or vice-versa). Returns 10m resolution grids.
	LookupLocation	Enables a grid reference to be looked up for a specified locality or town. Returns 10m resolution grids.
	Distance	Calculates the distance between two grid references or latitude and longitude values. Returns 10m resolution grids.
Email	Full	Full email validation including live domain lookup
	Format	Validate email addres format is correct only
	TLD	Validate email format is correct and the top level domain exists
	Local	Validate email format, top level domain and for well known domains carry out additional checks of the local portion of the address

5.2.3. The Fields Parameter

This parameter provides the list of fields which are to be searched/returned by the XML operation. In most cases you would set this to the Standard preset which is the standard field list for the data and task including fully formatted address fields were appropriate. However, other formats are also available, and the List option can be particularly useful to reduce the amount of XML returned if you are presenting a list of results to the user first. You should note that additional XML fields may be added to any of these presets in future releases, but fields would not be removed.

For a full list of the fields included in each field preset, please see Appendix J.

Fields Preset	**Valid for Data Parameters:**	**Provides**
List	Address, Bank, Nearest	Only the bare essential fields to allow the user to select the desired result from a list box. This includes the list item and key and for Address fields also includes the Postcode and PostcodeFrom parameters to allow changed postcodes to be detected.
Standard	(All)	Returns all applicable fields for the data type, including a fully formatted address, as would be used on an address label, where applicable.
Raw	Address, Bank	Returns all applicable fields for the data type, but the address is included in the raw PAF format, for example house number, dependant thoroughfare and thoroughfare are returned as individual fields rather than a single Street field.
BS7666	Address	Returns all applicable fields for the data type, but the address is included in a BS7666 compliant format which is useful if you require to store addresses in this form.
USA	Address	Returns fields in the format used in the USA, most useful when used with ZipAddress for looking up US addresses. However, this format will also work with UK addresses just as the UK formats will work with US addresses.
Simple	Address	Returns only the standard UK name and address, list and key fields when you require address data only and wish to minimise the amount of XML data returned.
International	Address	Recommended for international addresses, but also useable with UK addresses. This returns formatted address lines which provides the address in a format ready for printing on an envelope or address label, as well as component address fields.
Account	Bank	Contains applicable fields for Account Number validation.
Card	Bank	Contains applicable fields for Card Number validation.

Alternatively you can specify your own list of fields to return instead of the preset in the format, field1:maximum length 1@field2:maximum length2…

For example:

&Fields=Lookup:255@Name:120@Organisation:120@Property:120@Street:120 @Locality:70@Town:30@Postcode:10@PostcodeFrom:8@Key:40@List:512

When doing this you must ensure you include all fields you would like to be input and output, including those you would supply on the query string (such as the Lookup field).

However, using one of the presets shown in the above table is the preferred option when using XML.

5.2.4. The Skip Parameter – UK Address Management Only

For address management products the skip parameter can be used to skip records, for example to return the first record on a postcode only.

The available options are as follows:

Field Value	Description
None (or blank)	Returns all records matching the lookup or search criteria specified.
Address	Only the first record per address (e.g., first listed resident) is returned. Only has any effect in Names & Numbers.
Postcode	Only the first record per postcode is returned.
Sector	Only the first record in each postcode sector is returned. (A postcode sector is the portion of the postcode before the space plus the first digit after it, e.g. B11 1 is a sector).
Outcode	Only the first record per Outcode is returned. The Outcode is the portion of the postcode before the space, e.g., B11.
Town	Only the first record per Post Town, e.g., Birmingham is returned.
Area	Only the first record per Postcode Area is returned. A Postcode Area is the letters at

	the start of the postcode, e.g., B11 1AA is in Postcode Area B, IM8 is in Postcode Area IM.

5.2.5. Additional Parameters

The following additional parameters can be supplied in the query string to set Common API options:

Parameter	**Description**
Clearing	BankFinder Only: Set to "UK" to return UK member (BACS) banks only, set to "Irish" for IPSO member banks only.
NoSort	Names & Numbers Only: Set to 1 if you do not wish records to be returned in number sorted order (will instead be sorted by DPS).
ListSurname	Names & Numbers Only: Set to 1 to return the surname first in the list return item.
ApproxGrids	Address Management Products Containing Grid References Only: Set to 1 to provide an approximate grid reference for the postal town or locality of a postcode where no postcode level grid reference exists in the data.
Postzon	Set to 1 to return Royal Mail Postzon grid references in preference to DataTalk GeoRef grids.

5.2.6. Database Parameters for Nearest

When using Nearest you will also need to specify the following parameter to specify the database to use (this is connected too on the server side):

Parameter	**Description**
DBConnect	The name of the database to connect to as defined by a Nearest: <DBName> section in afddata.ini

As a security precaution only, databases specified in afddata.ini can be connected to and the settings which are used are specified in that ini file. You need to ensure the afddata.ini file is in your windows folder (e.g., c:\windows or c:\winnt folder) and has a section called "Nearest: <DBName>" where DBname is the name used in the DBConnect parameter for PCE calls.

This section requires the following settings to connect to the database:

Parameter	**Description**
Type	The Database Type – ODBC, Access, Paradox or XBase.
Name	The name of the DSN to connect too in the case of an ODBC database, or the filename in the case of Access, Paradox, or XBase databases.
UID	The username if required for an ODBC Connection (can be omitted if not required).
PWD	The password if required for an ODBC Connection (can be omitted if not required).
SQL	The SQL String to use to Query your database (e.g., SELECT * FROM TABLE). Not required for Paradox or XBase.
Primary	The name of the Primary Key Field in your Nearest database.
GridE	The name of the field containing the Grid Easting values in your database. If your database does not contain grid references, you will need to add a GridE and GridN field and use the product front-end or AFD Refiner to populate these fields with the grid references which Nearest requires to function.
GridN	The name of the field containing the Grid Northing values in your database.
List	Specifies the fields (comma separated) to use to construct the List. It is recommended that this contains either the Miles or Km field provided by PostcodeEverywhere to provide the distance followed by some of your database fields to identify the record to the user. The list item is often presented in order of distance to allow the user to select the required record. Even if you are going to construct your own list or not use a list it is recommended to configure this correctly for testing purposes.

An example section for connecting to a DSN called Phones4U containing a table called Nearest would be:

```
[Nearest: phones4u]
Type=ODBC
Name=Phones4U
UID=username
PWD=password
```

```
SQL=SELECT * FROM NEAREST
Primary=Postcode
GridE=GridE
GridN=GridN
List=Miles,Postcode,Title
```

5.3. Lookup Function

The most commonly used function across our product range is the Lookup function. By entering a single string, the user can find the results matching their lookup criteria.

To carry out a lookup you would pass a query string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2. The only additional parameter needed is Lookup= which should be set to the lookup string to find.

If you are wishing to use International data, then you will also need to add the &Country= or &CountryISO parameter (e.g. &CountryISO=FRA) to specify the country to use if it is not the UK (GBR).

For example, a valid lookup string for our hosted service to retrieve a list of matching results from an Address Management product would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Address&Task=FastFind&Fields=List&Lookup=B111AA

When using BankFinder you may wish to add the clearing system you wish to restrict records to as well. You can do this by adding the Clearing parameter to the string. Using Clearing=UK restricts records to those on the UK (BACS) clearing system only. Using Clearing=Irish restricts records to those on the Irish (IPSO) clearing system only. If you can only clear through the UK system it is important to include the Clearing=UK parameter, for example:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Bank&Clearing=UK&Task=FastFind&Fields=List&Lookup=050246

An example string to retrieve a nearest result using AFD Nearest functionality would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Nearest&Task=FastFind&Fields=List&DBConnect=MyDB&MaxQuantity=20&Miles=200&Lookup=B111AA

If an error occurs the Result field returned will be set to a value less than zero and the ErrorText will contain a corresponding error message.

In the case of Address Management products, the PostcodeFrom field returned in each XML item will be set if a postcode was looked up which has changed following a Royal Mail recoding. The lookup will complete using the new postcode (found in the Postcode field), however you may wish to display a message notifying the user of this.

Assuming no error occurred, you can then either add each result to a list box (using Field=List would reduce the size of the XML returned in this case) or process each result in full.

```
Example VB Code for carrying out an Address Management lookup

' Declare XML Objects and variables
Dim xmlDoc As Object
Dim root As Object
Dim pcFromNode As Object
Dim dataNode As Object
Dim itemNodes As Object
Dim listNode As Object
Dim keyNode As Object
Dim xmlLocation As String

' Initialise the Microsoft XML Document Object Model
Set xmlDoc = CreateObject("Microsoft.XMLDOM")
xmlDoc.async = False

' Replace lstResult with the name of your list box for the results
With lstResult

' Clear out any existing items in the list
.Clear

' Build up the XML query string
xmlLocation = AFD_SERVER + "/afddata.pce?
xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
```

```
 xmlLocation = xmlLocation + "Data=Address&Task=FastFind&Fields=List

 ' Set the maximum number of records to return
 xmlLocation = xmlLocation + "&MaxQuantity=100"

 ' Set the lookup string
 xmlLocation = xmlLocation + "&Lookup=" + txtLookup.Text ' Change txtLookup to your lookup entry textbox

 ' Load the XML from the webserver with the query string
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If

 ' Check if PCE returned an error and if the document is valid
 Set root = xmlDoc.documentElement
 Set dataNode = root.selectSingleNode("Result")
 Set itemNodes = root.selectNodes("Item")
 If dataNode Is Nothing or itemNodes Is Nothing Then
   Msgbox "Invalid PCE XML Document"
   Exit Sub
 End If
 If Val(dataNode.Text) < 1 Then
   Set dataNode = root.selectSingleNode("ErrorText")
   If dataNode Is Nothing Then
     Msgbox "Invalid PCE XML Document"
   Else
     Msgbox dataNode.Text ' Show the user the error
   End If
   Exit Sub
 End If

 ' Display any changed postcode if applicable
 Set pcFromNode = itemNodes(0).selectSingleNode("PostcodeFrom")
 Set dataNode = itemNodes(0).selectSingleNode("Postcode")
 If Not (pcFromNode Is Nothing) and Not (dataNode Is Nothing) Then
   If pcFromNode.Text <> "" Then
     MsgBox "Postcode has changed from " + pcFromNode.Text + " to " + dataNode.Text
   End If
 End If

 ' Now add matching records to the list box
 For Each dataNode In itemNodes
     ' Get the data nodes
     Set listNode = dataNode.selectSingleNode("List")
     Set keyNode = dataNode.selectSingleNode("Key")
     If Not (listNode Is Nothing) And Not (keyNode Is Nothing) Then
       ' Add the item to the list box with hidden key at the end
       .AddItem listNode.Text + Space(512) + keyNode.Text
     End If
 Next

 If .ListCount <> 0 Then .ListIndex = 0 ' Select First item in the list
```

End With

5.4. Search Function

The search function allows records to be located by searching using specific fields rather than a general lookup string. It allows any of the Fields to be searched that are specified as being searchable for the AFD product that you are using in Appendix A (for Address Management products) or Appendix B (for BankFinder). In the case of Nearest any field in your database can be searched for.

To carry out a search you would pass a query string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2. You should add a parameter for each field that you wish to search on.

If you are wishing to use International data, then you will also need to add the &Country= or &CountryISO parameter (e.g. &CountryISO=FRA) to specify the country to use if it is not the UK (GBR).

For example, a valid lookup string for our hosted service to retrieve a list of matching results for a search for Commercial Street in the street field and Birmingham in the town field from an Address Management product would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Address&Task=Search&Fields=List&Street=Commercial%20Street&Town=Birmingham

When using BankFinder you may wish to add the clearing system you wish to restrict records to as well. You can do this by adding the Clearing parameter to the string. Using Clearing=UK restricts records to those on the UK (BACS) clearing system only. Using Clearing=Irish restricts records to those on the Irish (IPSO) clearing system only. If you can only clear through the UK system it is important to include the Clearing=UK parameter, for example:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Bank&Clearing=UK&Task=Search&Fields=List&OwnerBankFullName=Natwest&Town=Birmingham

If an error occurs the Result field returned will be set to a value less than zero and the ErrorText will contain a corresponding error message.

Assuming no error occurred, you can then either add each result to a list box (using Field=List would reduce the size of the XML returned in this case) or process each result in full.

Example VB code for an Address Management Search:

```
' Declare XML Objects and variables
Dim xmlDoc As Object
Dim root As Object
Dim pcFromNode As Object
Dim dataNode As Object
Dim itemNodes As Object
Dim listNode As Object
Dim keyNode As Object
Dim xmlLocation As String

' Initialise the Microsoft XML Document Object Model
Set xmlDoc = CreateObject("Microsoft.XMLDOM")
xmlDoc.async = False

' Replace lstResult with the name of your list box for the results
With lstResult

' Clear out any existing items in the list
.Clear

' Build up the XML query string
xmlLocation = AFD_SERVER + "/afddata.pce?
xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
xmlLocation = xmlLocation + "Data=Address&Task=Search&Fields=List

' Set the maximum number of records to return
xmlLocation = xmlLocation + "&MaxQuantity=100"

' Set the parameters to search on
xmlLocation = xmlLocation + "&Organisation=" + txtSearchOrganisation.Text
xmlLocation = xmlLocation + "&Property=" + txtSearchProperty.Text
xmlLocation = xmlLocation + "&Street=" + txtSearchStreet.Text
xmlLocation = xmlLocation + "&Locality=" + txtSearchLocality.Text
xmlLocation = xmlLocation + "&Town=" + txtSearchTown.Text
xmlLocation = xmlLocation + "&Postcode=" + txtSearchPostcode.Text
```

```
 ' Load the XML from the webserver with the query string
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If

 ' Check if PCE returned an error and if the document is valid
 Set root = xmlDoc.documentElement
 Set dataNode = root.selectSingleNode("Result")
 Set itemNodes = root.selectNodes("Item")
 If dataNode Is Nothing or itemNodes Is Nothing Then
   Msgbox "Invalid PCE XML Document"
   Exit Sub
 End If
 If Val(dataNode.Text) < 1 Then
   Set dataNode = root.selectSingleNode("ErrorText")
   If dataNode Is Nothing Then
     Msgbox "Invalid PCE XML Document"
   Else
     Msgbox dataNode.Text ' Show the user the error
   End If
   Exit Sub
 End If

 ' Now add matching records to the list box
 For Each dataNode In itemNodes
     ' Get the data nodes
     Set listNode = dataNode.selectSingleNode("List")
     Set keyNode = dataNode.selectSingleNode("Key")
     If Not (listNode Is Nothing) And Not (keyNode Is Nothing) Then
       ' Add the item to the list box with hidden key at the end
       .AddItem listNode.Text + Space(512) + keyNode.Text
     End If
 Next

 If .ListCount <> 0 Then .ListIndex = 0 ' Select First item in the list

 End With
```

5.5. Retrieve Function

If you have added items to a list retrieving own the List and Key items, you will want to re-retrieve a result should the user click on it. To retrieve the record, they select you should use the Key Field which will have been returned with each result, and which you should have stored with the list items.

To fetch the record, you would pass a query string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2 using the Retrieve Task. The only additional parameter needed is Key= which should be set to the key field which was returned for the item.

If you are wishing to use International data, then you will also need to add the &Country= or &CountryISO parameter (e.g. &CountryISO=FRA) to specify the country to use if it is not the UK (GBR).

For example, if you had retrieved a result with a key of B111AA1001 then a valid lookup string for our hosted service to retrieve the full result from an Address Management product would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Address&Task=Retrieve&Fields=Standard&Key=B111AA1001

If an error occurs (e.g., the key supplied was invalid) the Result field returned will be set to a value less than zero and the ErrorText will contain a corresponding error message, otherwise you will now have the record fields in the XML.

Note that only one item will ever be returned from a Retrieve Task as you are requesting a single item, by its key, which was earlier returned in a list.

Example VB code to fetch an item selected in the list for Address Management products:

```
' Declare XML Objects and variables
Dim xmlDoc As Object
Dim root As Object
Dim pcFromNode As Object
Dim dataNode As Object
Dim itemNodes As Object
Dim xmlLocation As String

' Initialise the Microsoft XML Document Object Model
Set xmlDoc = CreateObject("Microsoft.XMLDOM")
xmlDoc.async = False

' Build up the XML query string
xmlLocation = AFD_SERVER + "/afddata.pce?
xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
```

```
 xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
 xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
 xmlLocation = xmlLocation + "Data=Address&Task=Retrieve&Fields=Standard

 ' Set the maximum number of records to return
 xmlLocation = xmlLocation + "&MaxQuantity=100"

 ' Replace lstResult with the name of your list box for the results
 With lstResult

 ' Check a valid item is selected
 If .ListIndex = -1 Then
   Msgbox "No Item Selected"
   Exit Sub
 End If

 ' Set XML parameter to retrieve the selected record
 xmlLocation = xmlLocation + "&Key=" + Trim(Right(lstResult, 40)) ' Replace lstResult with the name of your list
box for the results

 ' Finished with the list box
 End With

 ' Load the XML from the webserver with the query string
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If

 ' Check if PCE returned an error and if the document is valid
 Set root = xmlDoc.documentElement
 Set dataNode = root.selectSingleNode("Result")
 Set itemNodes = root.selectNodes("Item")
 If dataNode Is Nothing or itemNodes Is Nothing Then
   Msgbox "Invalid PCE XML Document"
   Exit Sub
 End If
 If Val(dataNode.Text) < 1 Then
   Set dataNode = root.selectSingleNode("ErrorText")
   If dataNode Is Nothing Then
     Msgbox "Invalid PCE XML Document"
   Else
     Msgbox dataNode.Text ' Show the user the error
   End If
   Exit Sub
 End If

 ' Now Assign required fields to your application (only one will be returned)
 Set dataNode = itemNodes(0).selectSingleNode("Name")
 If Not (dataNode Is Nothing) Then txtName.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Organisation")
 If Not (dataNode Is Nothing) Then txtOrganisation.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Property")
```

```
If Not (dataNode Is Nothing) Then txtProperty.Text = dataNode.Text
Set dataNode = itemNodes(0).selectSingleNode("Street")
If Not (dataNode Is Nothing) Then txtStreet.Text = dataNode.Text
Set dataNode = itemNodes(0).selectSingleNode("Locality")
If Not (dataNode Is Nothing) Then txtLocality.Text = dataNode.Text
Set dataNode = itemNodes(0).selectSingleNode("Town")
If Not (dataNode Is Nothing) Then txtTown.Text = dataNode.Text
Set dataNode = itemNodes(0).selectSingleNode("Postcode")
If Not (dataNode Is Nothing) Then txtPostcode.Text = dataNode.Text
```

5.6. Account Number Validation – BankFinder Only

This function provides the ability to validate a sort code and account number. This checks that the account number is valid for the branch of the bank which the sortcode belongs to. This does not guarantee that the account number exists, or sufficient funds exist for any transaction, but greatly cuts down on errors due to incorrectly entered numbers. The function will also translate any non-standard account numbers (e.g., a 10-digit account number).

To carry out a validation you would pass a query string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2. You should supply a sortcode and account number as additional parameters (or instead the IBAN if validating an account number in that International standardised format).

For example, a valid lookup string for our hosted service to validate an account number 24782346 on sort code 774814 would be as follows:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Bank&Task=Account&Fields=Account&SortCode=774814&AccountNumber=24782346

You may wish to add the clearing system you wish to restrict records to as well. You can do this by adding the Clearing parameter to the string. Using Clearing=UK restricts records to those on the UK (BACS) clearing system only. Using Clearing=Irish restricts records to those on the Irish (IPSO) clearing system only. If you can only clear through the UK system it is important to include the Clearing=UK parameter, for example:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Bank&Clearing=UK&Task=Account&Fields=Account&SortCode=774814&AccountNumber=24782346

You can also supply a Roll Number in the case of crediting some building society accounts which require one which will also be checked.

If the account number is invalid, the Result field returned will be set to a value less than zero and the ErrorText will contain a corresponding error message.

Assuming no error occurred, you can assume the account number is valid, but should read the Sortcode, AccountNumber, IBAN and RollNumber (if required) and TypeOfAccount parameters in-case the number has been translated.

If the return value is AFD_SUCCESS (1) then the account number has been validated, if the return value is AFD_SUCCESS_NO_VALIDATION (2) then account numbers on this sortcode cannot be validated and so the number should still be treated as valid. This return code is provided so you can carry out an additional check on the account number, e.g., asking a customer on the phone to repeat it, checking it has been entered from a paper form correctly etc. if you wish to do so.

Note that the only Field type valid for validating account numbers is Standard as the result contains no address. Only a single result will ever be returned so there is no need to list results.

Should you also wish to check the branch details match those that the customer has supplied, check the transaction types allowed at this branch, or obtain the address to use for this branch (may not be the branch physical location) then you can carry out a lookup for the sortcode (see Section 5.3) to obtain the branch information.

Example VB code to validate an account number:

```
' Declare XML Objects and variables
Dim xmlDoc As Object
Dim root As Object
Dim pcFromNode As Object
Dim dataNode As Object
Dim itemNodes As Object
```

```
 Dim sortCodeNode As Object
 Dim accountNode As Object
 Dim typeOfAccountNode As Object
 Dim clearingSystemNode As Object
 Dim xmlLocation As String

 ' Initialise the Microsoft XML Document Object Model
 Set xmlDoc = CreateObject("Microsoft.XMLDOM")
 xmlDoc.async = False

 ' Build up the XML query string
 xmlLocation = AFD_SERVER + "/afddata.pce?
 xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
 xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
 xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
 xmlLocation = xmlLocation + "Data=Bank&Task=Account&Clearing=Both&Fields=Account

 ' Set the Sort Code and Account Number
 xmlLocation = xmlLocation + "&SortCode=" + txtValidateSortCode.Text ' Change txtValidateSortCode to your
sortcode entry textbox

 xmlLocation = xmlLocation + "&AccountNumber=" + txtValidateAccountNo.Text ' Change txtValidateAccountNo
to your account number entry textbox

 ' Load the XML from the webserver with the query string
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If

 ' Check if PCE returned an error and if the document is valid
 Set root = xmlDoc.documentElement
 Set dataNode = root.selectSingleNode("Result")
 Set itemNodes = root.selectNodes("Item")
 If dataNode Is Nothing or itemNodes Is Nothing Then
   Msgbox "Invalid PCE XML Document"
   Exit Sub
 End If
 If Val(dataNode.Text) < 1 Then
   Set dataNode = root.selectSingleNode("ErrorText")
   If dataNode Is Nothing Then
     Msgbox "Invalid PCE XML Document"
   Else
     Msgbox dataNode.Text ' Show the user the error
   End If
   Exit Sub
 End If

 ' Display validation result - with details to submit for payment - note non-standard account number's will be
translated
 Set sortCodeNode = itemNodes(0).selectSingleNode("SortCode")
 Set accountNode = itemNodes(0).selectSingleNode("AccountNumber")
 Set typeOfAccountNode = itemNodes(0).selectSingleNode("TypeOfAccount")
```

```
  Set clearingSystemNode = itemNodes(0).selectSingleNode("ClearingSystem")
  If sortCodeNode Is Nothing Or accountNode is Nothing Or typeOfAccountNode Is Nothing Or
clearingSystemNode is Nothing Then
    Msgbox "Invalid PCE XML Document"
  Else
    MsgBox "Account Number Valid: " + vbCrLf + vbCrLf + "Sortcode: " + sortCodeNode.Text + vbCrLf + "Account
Number: " + accountNode.Text + vbCrLf + "Type of Account Code: " + typeOfAccountNode.Text + vbCrLf +
"Clearing System: " + clearingSystemNode.Text

  End If
```

5.7. Card Number Validation – BankFinder Only

This function provides the ability to validate a card number, and optionally check that an expiry date indicates that the card is in-date. This checks that the card number is a valid one for the type of card and can indicate the card type. This does not guarantee that the card exists or that a transaction will be authorized, but greatly cuts down on errors due to incorrectly entered numbers.

To carry out a validation you would pass a query string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2. You should supply a card number, and optionally expiry date, as additional parameters.

For example, a valid lookup string for our hosted service to validate a card number of 4903005748392742 with expiry date 01/10 would be as follows:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Bank&Task=Card&Fields=Card&CardNumber=4903005748392742&ExpiryDate=01/10

If the card number is invalid, the Result field returned will be set to a value less than zero and the ErrorText will contain a corresponding error message.

Assuming no error occurred, you can assume the card number is valid. If you wish to determine the card type, the CardType field will hold this information.

Note that the only Field type valid for validating card numbers is Standard as the result contains no address. Only a single result will ever be returned so there is no need to list results.

Example VB code to validate a card number:

```
 ' Declare XML Objects and variables
 Dim xmlDoc As Object
 Dim root As Object
 Dim pcFromNode As Object
 Dim dataNode As Object
 Dim itemNodes As Object
 Dim xmlLocation As String

 ' Initialise the Microsoft XML Document Object Model
 Set xmlDoc = CreateObject("Microsoft.XMLDOM")
 xmlDoc.async = False

 ' Build up the XML query string
 xmlLocation = AFD_SERVER + "/afddata.pce?
 xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
 xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
 xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
 xmlLocation = xmlLocation + "Data=Bank&Task=Card&Fields=Card

 ' Set the Card Number and Expiry Date (Optional)
 xmlLocation = xmlLocation + "&CardNumber=" + txtValidateCardNo.Text ' Change txtValidateCardNo to your
card number entry textbox
 xmlLocation = xmlLocation + "&ExpiryDate=" + txtValidateExpiry.Text ' Change txtValidateExpiry to your expiry
date entry textbox

 ' Load the XML from the webserver with the query string
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If

 ' Check if PCE returned an error and if the document is valid
 Set root = xmlDoc.documentElement
 Set dataNode = root.selectSingleNode("Result")
 Set itemNodes = root.selectNodes("Item")
 If dataNode Is Nothing or itemNodes Is Nothing Then
   Msgbox "Invalid PCE XML Document"
   Exit Sub
 End If
 If Val(dataNode.Text) < 1 Then
   Set dataNode = root.selectSingleNode("ErrorText")
   If dataNode Is Nothing Then
     Msgbox "Invalid PCE XML Document"
   Else
     Msgbox dataNode.Text ' Show the user the error
```

```
  End If
  Exit Sub
End If

' Display validation result
Set dataNode = itemNodes(0).selectSingleNode("CardType")
If dataNode Is Nothing Then
  Msgbox "Invalid PCE XML Document"
Else
  MsgBox "Card Valid: " + dataNode.Text
End If
```

5.8. List Functions – UK Address Management Only

With Postcode Plus, Names & Numbers and TraceMaster products you can use the list functions to obtain a list of alias localities for the postcode sector that a postcode or result is contained in. These are non-postally required localities held by Royal Mail which can or may be included on an address if desired. An example of this would be including Wimbledon for an address in London. You should note that these are stored at postal sector level (e.g., SW19 1) and there are often multiple entries for an address so a locality being returned does not mean it is necessarily the best one for the particular address you are viewing.

For Names & Numbers and TraceMaster products only it is also possible to obtain a list of possible values for most fields, e.g., all the Mailsort codes present, business descriptions, etc. You can also specify the start value of the field, e.g., return all surnames present starting with “Smith”.

When using International data, you can also use the List functions to obtain a list of all available countries (names or ISO codes).

To carry out a lookup you would pass a query string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2. The only additional parameter needed is Lookup= which should be set to the lookup string to find.

For example, a valid lookup string for our hosted service to retrieve a list of alias localities for the sector containing postcode B29 4AA would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=List&Task=ListAliasLocality&Fields=Standard&Lookup=B29 4AA

With Names & Numbers a string to return all possible values for the Size (of business) field would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=List&Task=ListSize&Fields=Standard&Lookup=
A string to return surnames starting Smith would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=List&Task=ListSurname&Fields=Standard&Lookup=Smith

If an error occurs the Result field returned will be set to a value less than zero and the ErrorText will contain a corresponding error message.

Assuming no error occurred, you can then process the results returned as desired.

***Example VB code for a List operation to retrieve alias localities*:**

```
Dim details As AFDListData
Dim retVal As Long
Static running As Boolean

' Prevent corruption of list box from button being clicked twice
If running Then Exit Sub
running = True

' Replace lstResult with the name of your list box for the results
With lstResult

' Clear out any existing items in the list
.Clear

' Reset Cancel flag
cancelFlag = False

' Set the lookup
details.Lookup = txtLookup.Text ' Change txtLookup to the postcode or record key you wish to lookup

' Carry out the lookup (Can alter the operation to retrieve N&N list items if desired)
retVal = AFDData(afdFieldSpec, AFD_LIST_ALIAS_LOCALITY, details)

' Abort with Message if error or user cancelled
```

```
 If retVal < 0 Then
   MsgBox AFDErrorText(retVal)
   running = False
   Exit Sub
 End If

' Now add matching records to the list box
 Do While retVal >= 0
   ' Add the item to the list box with hidden key at the end
       .AddItem Trim(details.List)
       ' Give user the chance to cancel and allow list box to update
   DoEvents
   ' Check if user cancelled
   If cancelFlag Then
     MsgBox "Lookup Cancelled"
     running = False
     Exit Sub
   End If
   retVal = AFDData(afdFieldSpec, AFD_GET_NEXT + AFD_LIST_ALIAS_LOCALITY, details)
 Loop

 ' Check results have been returned
 If .ListCount = 0 Then
   MsgBox "No Results Found"
 Else
   .ListIndex = 0 ' Select First item in the list
 End If

 End With

 running = False
```

Example C++ Code For an Address Management Lookup (Visual C++)

```
 HINSTANCE afdDLL = (HINSTANCE)NULL;
 AFDDATA afdData = (AFDDATA)NULL;
 static bool running = false;
 afdListData details;
 char listItem[2055];
 char msgTxt[255];
 long retVal;
 CListBox* listBox;
 MSG msg;

 // Check if we are already running to prevent crossing over items in the listbox
 if (running) return;
 running = true;

 // Load DLL
 if (!afdInitDLL(&afdDLL, &afdData)) {
   MessageBox("Error Loading afddata.dll", "Error", 0);
   return;
 }

 // Replace m_lstResult with the name given to a variable assigned to your list box control for the results
 listBox = &m_lstResult;
```

```
// Clear out any existing items in the list
listBox->ResetContent();

// Reset Cancel flag
cancelFlag = false;

// Update Data so we can read the lookup variable
UpdateData(TRUE);

// Set the lookup
strcpy(details.Lookup, m_txtLookup); // Change this to the postcode or record key you wish to lookup

// Carry out the lookup (Can alter the operation to retrieve N&N list items if desired)
retVal = (afdData)(afdFieldSpec, AFD_LIST_ALIAS_LOCALITY, (char*)&details);

// Abort with Message if error or user cancelled
if (retVal < 0) {
 AFDErrorText(retVal, msgTxt);
 MessageBox(msgTxt, "Error", 0);
 running = false;
 return;
}

// Now add matching records to the list box
while (retVal >= 0) {
    // make up list item
    strncpy(listItem, details.List, sizeof(details.List));
 listItem[sizeof(details.List)] = '\0';
 // Add the item to the list box
 listBox->AddString(listItem);
 // Give user the chance to cancel and allow list box to update
 if(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)) {
  TranslateMessage(&msg);
  DispatchMessage(&msg);
 }
 // Check if user cancelled
 if (cancelFlag) {
  MessageBox("Search Cancelled", "Cancelled", 0);
  return;
 }
 retVal = (afdData)(afdFieldSpec, AFD_GET_NEXT + AFD_LIST_ALIAS_LOCALITY, (char*)&details);
}

// Check results have been returned
if (listBox->GetCount() == 0)
 MessageBox("No Results Found", "Error", 0);
else {
 listBox->SetCurSel(0); // Select First item in the list

 OnSelchangeLstResult(); // Set this to your list change method to simulate selecting the first list item

}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

```
running = false;
```

5.9. String Utility Functions – Depeciated and Unsupported

These are provided for compatibility with existing applications which may depend on them but for new developments we would recommend you use in-built functions which are included with most modern development environments.

To carry out a string operation you would pass the string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2.

For example, a valid lookup string for our hosted service to search for instances of "is" and replace them with "it" in the string "this is a test" would be as follows:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=String&Task=SearchReplace&Fields=Standard&Search=is&Replace=it&Lookup=this%20is%20a%20test.

The String Utility Tasks supported, and the parameters required are as follows:

Task	**Parameters**	**Description**
SearchReplace	Search Replace Lookup	All occurrences in the specified Lookup field of the string specified in the Search field are replaced with the string in the Replace field.
SearchReplaceCase	Search Replace Lookup	This is the same as SearchReplace but is case sensitive.
Capitalise	Lookup	This corrects the capitalisation of the Lookup field. For example, 'commercial STREET' would become 'Commercial Street'.
CleanLine	Lookup	This cleans the Lookup field by removing spurious characters that should not be in an address line, e.g., a trailing comma.
CheckPostcode	Lookup	This checks if the string specified in the Lookup field looks like a postcode.

CleanPostcode	Lookup	This cleans the postcode specified in the Lookup field to tidy up the postcode specified.
AbbreviateCounty	Lookup	This provides the Royal Mail Approved county abbreviation for the county specified in the Lookup field if one exists.

The resulting string will be found in the Lookup Field of the single Item which will be returned. When using the CleanPostcode function the Outcode and Incode portions of the postcode (portion before and after the space) will also be available in the separate Outcode and Incode Fields which are present in the XML returned.

***Example VB code for a Search/Replace String Operation*:**

```
 ' Declare XML Objects and variables
 Dim xmlDoc As Object
 Dim root As Object
 Dim pcFromNode As Object
 Dim dataNode As Object
 Dim itemNodes As Object
 Dim xmlLocation As String

 ' Initialise the Microsoft XML Document Object Model
 Set xmlDoc = CreateObject("Microsoft.XMLDOM")
 xmlDoc.async = False

 ' Build up the XML query string
 xmlLocation = AFD_SERVER + "/afddata.pce?
 xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
 xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
 xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
 xmlLocation = xmlLocation + "Data=String&Fields=Standard"

 ' Set the task (see String operations below for options
 xmlLocation = xmlLocation + "&Task=SearchReplace"


 ' Set the Lookup, Search and Replace parameters
 xmlLocation = xmlLocation + "&Lookup=" + txtLookup.Text ' Change txtLookup to your string entry textbox
 xmlLocation = xmlLocation + "&Search=" + txtSearch.Text ' Change txtSearch to your search entry textbox
 xmlLocation = xmlLocation + "&Replace=" + txtReplace.Text ' Change txtReplace to your replace entry textbox

 ' Load the XML from the webserver with the query string
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If
```

```
' Check if PCE returned an error and if the document is valid
Set root = xmlDoc.documentElement
Set dataNode = root.selectSingleNode("Result")
Set itemNodes = root.selectNodes("Item")
If dataNode Is Nothing or itemNodes Is Nothing Then
  Msgbox "Invalid PCE XML Document"
  Exit Sub
End If
If Val(dataNode.Text) < 1 Then
  Set dataNode = root.selectSingleNode("ErrorText")
  If dataNode Is Nothing Then
    Msgbox "Invalid PCE XML Document"
  Else
    Msgbox dataNode.Text ' Show the user the error
  End If
  Exit Sub
End If

' The updated string is held in itemNodes(0).selectSingleNode("Lookup").Text
```

5.10. Grid Utility Functions – UK Address Management Only

These functions are used to carry out operations related to grid references and latitude and longitude values. You can convert between GB and Irish based grid references and also convert to and from latitude and longitude values. The facility to convert a value in kilometers to miles and vice-versa, return an approximate grid reference for a location and also calculate the distance between two geographical locations is also included.

To carry out a grid operation you would pass the grid or latitude and longitude to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2.

For example, a valid URL string for our hosted service to convert the GB grid reference 40660, 28650 to latitude and longitude (Irish based grids would also be returned for it) would be as follows:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Grid&Task=Convert&Fields=Standard&GBGridE=40660&GBGridN=28650

The Grid Utility Tasks supported, and the parameters supported are as follows:

Task	**Parameters**	**Description**
Convert1m Convert	GBGridE, GBGridN Or NIGridE, NIGridN Or Latitude, Longitude Or TextualLatitude, TextualLongitude And/Or Miles/Km	Converts a GB or NI based grid reference, or latitude and longitude value to all other grid reference types and latitude and longitude values. The Convert1m function returns grids to a 1m resolution (6 digit), whereas Convert returns 5 digit grids.
LookupLocation1m LookupLocation	Lookup	Looks up a town, locality, or partial postcode specified in the Lookup field and provides an approximate grid reference and latitude and longitude values for the location if a match is found. Multiple matches may be returned if the location is ambiguous. The LookupLocation1m function returns grids to a 1m resolution (6 digit), whereas LookupLocation returns 5 digit grids.
Distance1m Distance	GBGridE, GBGridN Or NIGridE, NIGridN Or Latitude, Longitude AND: GBGridEFrom, GBGridNFrom Or NIGridEFrom, NIGridNFrom Or LatitudeFrom, LongitudeFrom	Calculates the distance between a pair of grid references or latitude and longitude values specified. You will need to set a grid or latitude and longitude value in both the normal fields and those prefixed with "From" to find the distance in both Miles and Km. The Distance1m function returns grids to a 1m resolution (6 digit), whereas Distance returns 5 digit grids.

You can then read the resulting grid reference, latitude and longitude values, or Km and Miles values as appropriate for the operation you have carried out and the data that you require.

Example VB code for converting a GB based grid reference:

```
' Declare XML Objects and variables
Dim xmlDoc As Object
Dim root As Object
Dim pcFromNode As Object
```

```
 Dim dataNode As Object
 Dim itemNodes As Object
 Dim xmlLocation As String

 ' Initialise the Microsoft XML Document Object Model
 Set xmlDoc = CreateObject("Microsoft.XMLDOM")
 xmlDoc.async = False

 ' Build up the XML query string
 xmlLocation = AFD_SERVER + "/afddata.pce?
 xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
 xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
 xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
 xmlLocation = xmlLocation + "Data=Grid&Fields=Standard"

 ' Set the task (see Grid operations below for options
 xmlLocation = xmlLocation + "&Task=Convert1m"


 ' Set the GBGridE and GBGridN parameters
 xmlLocation = xmlLocation + "&GBGridE=406600" ' Change 406600 to the grid easting value you wish to convert
 xmlLocation = xmlLocation + "&GBGridN=286500" ' Change 286500 to the grid northing value you wish to conver
 ' Load the XML from the webserver with the query string
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If

 ' Check if PCE returned an error and if the document is valid
 Set root = xmlDoc.documentElement
 Set dataNode = root.selectSingleNode("Result")
 Set itemNodes = root.selectNodes("Item")
 If dataNode Is Nothing or itemNodes Is Nothing Then
   Msgbox "Invalid PCE XML Document"
   Exit Sub
 End If
 If Val(dataNode.Text) < 1 Then
   Set dataNode = root.selectSingleNode("ErrorText")
   If dataNode Is Nothing Then
     Msgbox "Invalid PCE XML Document"
   Else
     Msgbox dataNode.Text ' Show the user the error
   End If
   Exit Sub
 End If


   ' Other elements of details hold converted values, e.g.
   '   Latitude is held in itemNodes(0).selectSingleNode("Latitude").Text
   '   Longitude is held in itemNodes(0).selectSingleNode("Longitude").Text

 ' Grid operations, set Task to one of the following:
 ' Convert1m - Set the GB Grid Reference, NI Grid Reference, Latitude or Longitude values and the rest of the properites will be filled in giving conversions for any of these items to any other.  Can also convert km to miles and vice-versa.
 ' LookupLocation1m - Set the lookup property to a location name (e.g. Locality or Town) and a grid reference approximation will be returned if matched.
 ' Distance1m - Set a grid reference or latitude and longitude values in both the standard fields and the fields prefixed with From and this will calculate the distance between those two points.
```

5.11. Email Utility Function – UK Address Management Only

This function is used to validate the format of an email address is correct and that the domain specified has a valid mail server registered for it.

To carry out an email operation you would pass the email address to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2.

For example, a valid URL string for our hosted service to validate the email addresss support@afd.co.uk would be as follows:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Email&Task=Full&Fields=Standard&Email=support@afd.co.uk

The Email Utility Tasks supported, and the required parameter is as follows:

Task	**Parameter**	**Description**
Full	Email	Full email validation including live domain lookup
Format	Email	Validate email address format is correct only
TLD	Email	Validate email format is correct and the top level domain exists
Local	Email	Validate email format, top level domain and for well known domains carry out

The function will return a result >=0 if the email address is valid.

Example VB code for converting a GB based grid reference:

```
  ' Declare XML Objects and variables
  Dim xmlDoc As Object
  Dim root As Object
  Dim pcFromNode As Object
  Dim dataNode As Object
  Dim itemNodes As Object
  Dim xmlLocation As String

  ' Initialise the Microsoft XML Document Object Model
  Set xmlDoc = CreateObject("Microsoft.XMLDOM")
  xmlDoc.async = False

  ' Build up the XML query string
  xmlLocation = AFD_SERVER + "/afddata.pce?
  xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
  xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
  xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
  xmlLocation = xmlLocation + "Data=Email&Fields=Standard"

  ' Set the task (see Email operations below for options
  xmlLocation = xmlLocation + "&Task=Full"

  ' Set the Email parameter
  xmlLocation = xmlLocation + "&Email=support@afd.co.uk" ' Change support@afd.co.uk to the email address you
wish to validate
  ' Load the XML from the webserver with the query string
  xmlDoc.Load (xmlLocation)

  ' Check for any XML Parser error
  If xmlDoc.parseError.errorCode < 0 Then
    Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
    Exit Sub
  End If

  ' Check if PCE returned an error and if the document is valid
  Set root = xmlDoc.documentElement
  Set dataNode = root.selectSingleNode("Result")

  If dataNode Is Nothing Then
    Msgbox "Invalid PCE XML Document"
    Exit Sub
  End If
  If Val(dataNode.Text) < 1 Then
    Set dataNode = root.selectSingleNode("ErrorText")
    If dataNode Is Nothing Then
      Msgbox "Invalid PCE XML Document"
    Else
      Msgbox dataNode.Text ' Show the user the error
    End If
    Exit Sub
  Else
    Msgbox “Email Address Valid”
  End If

  ' Email operations, set Task to one of the following:
  ' Full - Full email validation including live domain lookup
  ' Format - Validate email addres format is correct only
  ' TLD - Validate email format is correct and the top level domain exists
  ' Local - Validate email format, top level domain and for well known domains carry out additional local part
checks
```

5.12. Clean Function – UK Address Management Only

Requires a Refiner API License

The clean function allows an address, for example from a database, to be cleaned, i.e., where possible matched to Postcode Plus and therefore given a correct deliverable address.

To clean an address, you would pass a query string to the afddata.pce URL on the Postcode Everywhere XML server as described in section 5.2. You should add a parameter for address fields specifying the address you wish to clean. These do not need to match up to the actual fields, for example if you have Address Line 1, Address Line 2, Address Line 3 and Postcode in your database you could set these to Property, Street, Locality and Postcode fields parameters and they will be cleaned and returned in the correct named fields when matched. Note that if you set any non-address fields they will be ignored.

For example, a valid lookup string for our hosted service to clean the address "276c, Roton Park Road, Roton Park, Warwikshire, B16 6DE" would be:

http://pce.afd.co.uk/afddata.pce?Serial=000000&Password=PASSWORD&UserID=MyApp&Data=Address&Task=Clean&Fields=Standard&Property=276c&Street=Roton%20Park%20Road&Town=Roton%20Park&PostalCounty=Warwikshire&Postcode=B16%206DE

The Result field returned will be set to a value less than zero in the case where an address cannot be fully matched. This could be because the address was unmatchable, International, or an ambiguous result was found (see Section 4.1.9 for details of these return codes). An address will still be returned as this will include the address with Field Placement correction which you can use if you desire.

Where the Result field contains a positive value (greater than zero) this means that the address has been uniquely matched. You may still like to examine the return value as this will give details as to the level to which the address was matched (see Section 4.1.9 for details of these return codes).

Many other fields are also avaliable with additional (non-address data) which you may require.

In the case of an ambiguous or suggested result (return code is -102, -103, or -104) the first address returned from the function will be the original address with field placement. For non-batch processes you may wish to present a list of addresses for the user to choose from, as these will all be contained in the returned XML. However, you cannot pass the keys back to the API on record selection through Postcode Everywhere as these are not permanent records and as such will not be available if looked up on a different thread or after another lookup. It is therefore important to read records in and store them from the XML following the lookup if you wish to do this.

***Example VB code for an Address Management Clean*:**

```
' Declare XML Objects and variables
Dim xmlDoc As Object
Dim root As Object
Dim dataNode As Object
Dim itemNodes As Object
Dim listNode As Object
Dim keyNode As Object
Dim resultCode As Long
Dim xmlLocation As String

' Initialise the Microsoft XML Document Object Model
Set xmlDoc = CreateObject("Microsoft.XMLDOM")
xmlDoc.async = False

' Replace lstResult with the name of your list box if you wish to display ambiguous results
With lstResult

' Clear out any existing items in the list
.Clear

' Build up the XML query string
xmlLocation = AFD_SERVER + "/afddata.pce?
xmlLocation = xmlLocation + "Serial=" + AFD_SERIAL_NUMBER + "&"
xmlLocation = xmlLocation + "Password=" + AFD_PASSWORD + "&"
xmlLocation = xmlLocation + "UserID=" + AFD_USER_ID + "&"
xmlLocation = xmlLocation + "Data=Address&Task=Clean&Fields=Standard

' Set the parameters to specify the address that you wish to clean
xmlLocation = xmlLocation + "&Organisation=" + txtSearchOrganisation.Text
xmlLocation = xmlLocation + "&Property=" + txtSearchProperty.Text
xmlLocation = xmlLocation + "&Street=" + txtSearchStreet.Text
xmlLocation = xmlLocation + "&Locality=" + txtSearchLocality.Text
xmlLocation = xmlLocation + "&Town=" + txtSearchTown.Text
xmlLocation = xmlLocation + "&Postcode=" + txtSearchPostcode.Text
```

```
 ' Load the XML from the webserver with the query string to clean the address
 xmlDoc.Load (xmlLocation)

 ' Check for any XML Parser error
 If xmlDoc.parseError.errorCode < 0 Then
   Msgbox "Error: " & xmlDoc.parseError.reason & vbCrLf & "Microsoft.XMLDOM Error Code: " &
Str(xmlDoc.parseError.errorCode)
   Exit Sub
 End If

 ' Check if the document is valid
 Set root = xmlDoc.documentElement
 Set dataNode = root.selectSingleNode("Result")
 Set itemNodes = root.selectNodes("Item")
 If dataNode Is Nothing or itemNodes Is Nothing Then
   Msgbox "Invalid PCE XML Document"
   Exit Sub
 End If
 resultCode = Val(dataNode.Text)

 ' Show the resulting address
 Set dataNode = itemNodes(0).selectSingleNode("Name")
 If Not (dataNode Is Nothing) Then txtName.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Organisation")
 If Not (dataNode Is Nothing) Then txtOrganisation.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Property")
 If Not (dataNode Is Nothing) Then txtProperty.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Street")
 If Not (dataNode Is Nothing) Then txtStreet.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Locality")
 If Not (dataNode Is Nothing) Then txtLocality.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Town")
 If Not (dataNode Is Nothing) Then txtTown.Text = dataNode.Text
 Set dataNode = itemNodes(0).selectSingleNode("Postcode")
 If Not (dataNode Is Nothing) Then txtPostcode.Text = dataNode.Text

 ' Show cleaning status
 Set dataNode = root.selectSingleNode("ErrorText")
 If dataNode Is Nothing Then
   Msgbox "Invalid PCE XML Document"
 Else
   Msgbox dataNode.Text
 End If

 End With
```

While the default is fine for most users, If you wish to set any of the advanced cleaning options you can do this by adding those options to the Task string after the word Clean, e.g., Task=Clean0AS.

The options supported are as follows: (Please see the main Refiner manual for more detail regarding each of these options)

0 - Specifies the default cleaning mode where the address is fully cleaned

1 - Specifies that the input record will only be cleaned if the address can be verified against the supplied postcode.

2 – Specifies that only full matches should be returned

3 – Uses Attach Mode only (fields are returned based on the postcode)

N – Use non-separated fields (Useful for databases where fields are not seperated, e.g., the street and town are entered on the same line with no comma etc. between them)

A – No Ambiguous Matches (do not return list of addresses to choose from if the address cannot be uniquely matched)

S – No Suggested Matches (do not return a suggested match along with the original address if the address cannot be matched but there is a possible unique match)

U – Assume the Postcode is correct (this option allows less reliable matching on the assumption that the postcode is correct if the address cannot otherwise be verified. In Attach mode this allows a property and postcode to be matched)

T – Give Ambiguous Matches in Preference to Street Level (if an address cannot be uniquely matched to an individual property the original property information is normally retained, this option gives the ambiguous addresses to choose from instead).

P – Match PO Box Last (Some PO Box addresses contain some Street address information too even though the address is meant for a PO Box. If you wish Refiner to try and match it to a street address first then select this option).

L – Retain Alias Localities (If the address is matched using an alias locality this will be retained in the address – Alias Localities are not normally retained as they are not required for the address to be deliverable).

O – Do not move data to Organisation (Normally Refiner will put additional address data for street level only matches in the property field unless they look like an Organisation or there is already a property. Specifying this option ensures Refiner never returns such data in the Organisation field - useful if you are not going to use the Organisation field returned).

W – Do not use the Default DPS (if an address is not matched to a full Delivery Point Record, a default of 9Z is assigned which can still be used for printing bar codes etc., if you do not wish this to be used then use this option)

F – Do not use Field Placement (By default if an address cannot be matched Refiner attempts to format the address correctly on return, if you would rather it was left “as-is” then use this option.

6. Other Features

6.1. Selecting TraceMaster Datasets

AFD Names & Numbers TraceMaster includes historic datasets for Address Management Data going back to 1998. These provide previous year's electoral rolls and business data. Lookup and Search operations function as described in sections 4.2 and 4.3 of this documentation function with TraceMaster in the same way as with all other products.

By default, these operations will operate using the Current (latest) dataset. However, to use a historic dataset simply specify the dataset name (year) in the DataSet Field of the AFDData structure, type or XML parameter. The product will automatically carry out your Lookup or Search operation using the specified dataset.

To retrieve records from all datasets, with the standard API, you can call the AFDData function in a loop specifying each dataset in turn. If you are using the PostcodeEverywhere XML server you can simply repeat your lookup or search operation with a different dataset parameter each time.

6.2. Determining the Product in Use

When integrating with Address Management products the same code will work with any of our Address Management products (AFD Postcode, AFD Postcode Plotter, AFD Postcode Plus, AFD Names & Numbers and AFD Names & Numbers TraceMaster).

It is not normally necessary to determine which product has been used as you can integrate with one, e.g., Names & Numbers and the user can use any of our address management products – they will just have less data returned depending on the product they have. However, if for any reason, such as disabling/enabling features of your product - you can use the Product field if you wish to determine which product the user has and that has been used by the Common API.

Note that in the case of multiple address management products being installed the AFD Common API will use the highest-level product available.

For example, AFD Names & Numbers would be used in preference to AFD Postcode.

The Product field will contain one of the following values depending on the product being used:

- AFD Postcode
- AFD Postcode Plotter
- AFD Postcode Plus
- AFD Names & Numbers
- AFD Names & Numbers TraceMaster

Note that when carrying out a BankFinder operation AFD BankFinder will always be the product name returned.

6.3. Using Welsh Data in Postcode Plus

Welsh data is available for Postcode Plus on request. It works alongside the existing English language PAF data and provides Welsh language equivalents for streets, localities and towns in Wales where such equivalents are available.

To obtain address details using the Welsh variant simply set the DataSet property of the address structure, or DataSet parameter when using XML, to "Welsh" prior to making your call to the API. Any operation including lookup's, searches and retrieving records can be done using either dataset. Note that the data returned when using either dataset will be the same if no Welsh language alternative is available.

You can also retrieve the same record in both Welsh and English simply by calling the API to retrieve the record once with the DataSet property set to an empty string (or English if you prefer) and once set to "Welsh". For example, if you carry out a lookup for a postcode, as specified in Section 4.2 of this documentation, and add the items to a list box, when the user selects an item from the list you can retrieve the same address in both Welsh and English language variants by using the List Fetch operation described in

Section 4.4 twice for the same record, once with the DataSet parameter set to Welsh and once with it not set.

Example VB code to fetch an item selected in the list in both English and Welsh:

```
Dim details As AFDAddressData
Dim welshDetails As AFDAddressData
Dim pos As Long, retVal As Long

' Replace lstResult with the name of your list box for the results
With lstResult

' Check a valid item is selected
If .ListIndex = -1 Then
  MsgBox "No Item Selected"
  Exit Sub
End If

' Set DLL parameters to retrieve the selected record
details.Key = Mid(lstResult, 513) ' Replace lstResult with the name of your list box for the results

' We will want the same record in Welsh too
welshDetails.Key = details.Key

' Finished with the list box
End With

' Set DataSet to Welsh for welshDetails
details.DataSet = ""
welshDetails.DataSet = "Welsh"

' Carry out the lookup for English language data and then Welsh language data
retVal = AFDData(afdFieldSpec, AFD_RETRIEVE_RECORD, details)
retVal = AFDData(afdFieldSpec, AFD_RETRIEVE_RECORD, welshDetails)

' Abort with Message if error
If retVal < 0 Then
  MsgBox AFDErrorText(retVal)
  Exit Sub
End If



' Now Assign required fields to your application
' These are any of the members of the details. type (Use Trim to remove whitespace)
txtEnglishName.Text = Trim(details.PostalCounty)
txtEnglishOrganisation.Text = Trim(details.AbbreviatedPostalCounty)
txtEnglishProperty.Text = Trim(details.OptionalCounty)
txtEnglishStreet.Text = Trim(details.AbbreviatedOptionalCounty)
txtEnglishLocality.Text = Trim(details.TraditionalCounty)
txtEnglishTown.Text = Trim(details.AdministrativeCounty)
txtEnglishPostcode.Text = Trim(details.Postcode)
txtWelshName.Text = Trim(welshDetails.PostalCounty)
txtWelshOrganisation.Text = Trim(welshDetails.AbbreviatedPostalCounty)
```

```
txtWelshProperty.Text = Trim(welshDetails.OptionalCounty)
txtWelshStreet.Text = Trim(welshDetails.AbbreviatedOptionalCounty)
txtWelshLocality.Text = Trim(welshDetails.TraditionalCounty)
txtWelshTown.Text = Trim(welshDetails.AdministrativeCounty)
txtWelshPostcode.Text = Trim(welshDetails.Postcode)
```

Example C++ code to fetch an item selected in the list for Address Management products (Visual C++):

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
afdAddressData details;
afdAddressData welshDetails;
bool foundSel = false;
long retVal;
CListBox* listBox;
char lstStr[2055];
char msgTxt[255];

// Load DLL
if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
}

// Replace m_lstResult with the name given to a variable assigned to your list box control for the results
listBox = &m_lstResult;

// Set DLL parameters to retrieve the selected record
listBox->GetText(listBox->GetCurSel(), lstStr);
strncpy(details.Key, lstStr + sizeof(details.List), sizeof(details.Key));

// We will want the same record in Welsh too
strncpy(welshDetails.Key, details.Key, sizeof(details.Key));

' Set DataSet to Welsh for welshDetails
strcpy(details.DataSet, "");
strcpy(welshDetails.DataSet, "Welsh");

// Carry out the lookup for English language data and then Welsh language data
retVal = (afdData)(afdFieldSpec, AFD_RETRIEVE_RECORD, (char*)&details);
retVal = (afdData)(afdFieldSpec, AFD_RETRIEVE_RECORD, (char*)&welshDetails);

// Abort with Message if error
if (retVal < 0) {
  AFDErrorText(retVal, msgTxt);
  MessageBox(msgTxt, "Error", 0);
  return;
}

// Now Assign required fields to your application
// These are any of the members of the details. structure
m_txtEnglishName = details.Name;
m_txtEnglishOrganisation = details.Organisation;
m_txtEnglishProperty = details.Property;
m_txtEnglishStreet = details.Street;
m_txtEnglishLocality = details.Locality;
```

```
m_txtEnglishTown = details.Town;
m_txtEnglishPostcode = details.Postcode;
m_txtWelshName = welshDetails.Name;
m_txtWelshOrganisation = welshDetails.Organisation;
m_txtWelshProperty = welshDetails.Property;
m_txtWelshStreet = welshDetails.Street;
m_txtWelshLocality = welshDetails.Locality;
m_txtWelshTown = welshDetails.Town;
m_txtWelshPostcode = welshDetails.Postcode;

// Update Fields
UpdateData(FALSE);

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;
```

6.4. DX Member Data

DX Members can have access to DX data from within Postcode Plus and the Common API. This enables you to lookup and search for DX addresses just as you can do with Royal Mail postal addresses. Uniquely, the Common API also allows you to easily identify DX addresses associated with a PAF address to route your mail through a DX member's box wherever possible resulting in savings over Royal Mail.

If you run the Wizard to generate a code sample with DX data installed declarations will be included for the DXNumber (10 characters), DXExchange (30 characters) and DXProfession (30 Characters). You can also manually add these to your field specification string and structure. Postcode Everywhere users will automatically have these fields returned in the XML if they have the DX data installed.

Fast-find functionality works with DX data as well as postal data. For example, as well as looking up a postcode you can also carry out a fast-find for a DX number and searching for an organisaiton name with fast-find will search both postal and DX data. This allows you to easily combine your lookup's. When searching you can either search the standard postal fields or specify the DX Number, organisation, exchange or profession to search theDX data instead. (If you only want to specify one set of search fields in your application then placing DX followed by the DX number in the normal street field will work too – town can then be used to specify the exchange if desired).

When results are returned following any lookup or search if the address is also a DX Member the DXNumber, DXExchange and DXProfession fields will also be returned to indicate this. You can format a DX address as follows for printing:

<Organisation>	e.g.	Pannone LLP
DX <DXNumber>		DX 14314
<DXExchange>		MANCHESTER

See Appendix K for a current list of available DX Professions and Exchanges.

6.5. International Data

Customers signed up to use our International data service can lookup and search for international addresses in exactly the same way as you do for UK based addresses. The only difference in normal operation is the need to specify the Country or CountryISO code of the country that you wish to use in all lookup, search and record retrieval operations. A full list of these codes is given in Appendix L. of this manual.

If you are using any of our example applications generated from the API Wizard, simply add a Country field and set the Country property for all calls to the DLL to the contents of this field to try out International addressing with the example.

6.5.1. Enabling International Support

If you are using our hosted Postcode Internet Online service and have signed up for our International data service then you will simply need to add a Country or CountryISO field to specify the country to use for each lookup or search, and the International data will work with your existing integration.

If you are using our Standard API implementation (i.e., calling afddata.dll or afddata64.dll) or hosting your own Postcode Everywhere server then you will need to have specified authentication information (serial number and password) for our server as these requests must be passed through to our hosted server to be processed:

When using the standard API this is done by adding the {serial:password:userid} string to the options portion of your field specification string. The API Wizard can generate this for you if you fill out the required information when running the wizard, or you can see the documentation for this string in section 4.1.2 of this manual.

When using Postcode Everywhere hosted on your own server you simply need to ensure you have specified the &SerialNo= and &Password= options on the URL string for your request to your server so that they can be passed onto ours in the case of International addresses.

6.5.2. Making use of the data returned

If you have opted to use Standard, Raw PAF, or BS7666 fields the data will be returned in the same fields as those for the UK (including county in some cases) which you can use to store the data in your database in the same format as you do for UK addresses.

However, when it comes to generating an address label, you should note that the formatting rules for addresses vary from country to country (for example in many Western European countries the post/zip code comes before the town on the same line). Unless you have your own printing or formatting routines for the country in question, you may therefore actually prefer to use our International address format which provides both the consistuent address fields (broadly the same as Raw PAF fields but also adding the Principality, Region and Cedex which is relevant to some international addresses) as well as address label formatted fields (address1 through to address7). This enables you to both have a structure ideal for data storage and for label formatting.

If you need to store addresses in a more UK based format, but then need to format them for printing you can easily do so by carrying out a search operation specifying the address data with the International field type to obtain the address for printing at the time that you wish to generate an address label.

6.5.3. Obtaining a list of countries

You may well wish (using the list of countries in Appendix L) populate a drop-down list of countries in your application for the user to choose from which includes only those countries that you are interested in using. However, if you wish to have a complete list you can do so programmatically by calling the Country List function. Details of doing this is given in sections 4.4 (for the Standard API) and section 5.8 (for Postcode Everywhere) of this manual.

6.5.4. Notes regarding International addressing

It is important to note that the standards regarding what is an acceptable address vary widely from country to country as do the levels of data which are available. For example, while one country may have full address data from Organisation down, another may only be at street or even locality level. So, you must accommodate for different levels of data coming back and therefore differing amounts of manual entry which may be required by users of your software to provide a complete address.

7. Appendices

Appendix A. Address Management Product Fields

This currently includes Postcode, Plotter, Postcode Plus, Names & Numbers (including TraceMaster), and ZipAddress.

■	Field returned by this product and fully searchable.
□	Field returned by this product, but not searchable.

Note: The API Wizard will add one to the default size for development environments that normally use null terminated strings, e.g., C++ and C# to accommodate the null terminator.

Also note that the alternative address formats provided do share some of the same fields where their data is identical, but you should not mix and match other fields between the different formats as this could lead to address corruption. For example, with Standard Address Fields the Street or Locality field could include a street number, whereas with Raw PAF Fields the number would be in the separate Number field.

Field Name	Default Size	Description	Postcode	Plotter	Postcode Plus	Names & Numbers	ZipAddress
General Fields							
Lookup	255	Specify postcode (or zipcode) and fast-find lookup string's here for lookup operations.	■	■	■	■	■
Key	255	Provides a key which can be used to easily retrieve the record again, e.g. when a user clicks on an item in the list box.	■	■	■	■	■
List	512	Provides a list item formatted to be added to a list box for this record.	□	□	□	□	□

Product	40	Indicates the product name used [10]	□	□	□	□	□
Occupant Fields							
Name	120	Full name (includes title, first name, middle initial and surname).				□	
Gender	6	The gender (M or F) of the resident if known.				■	
Forename	30	The first name of the resident				■	
MiddleInitial	6	The middle initiate of the resident.				■	
Surname	30	The surname/last name of the resident.				■	
OnEditedRoll	6	Indicates if the resident is on the edited electoral roll (i.e., they have not opted out). Set to Y if they are on the Edited Roll, N if not, blank for Organisation and other records). To search set to #Y to return only records on the electoral roll, #N only for those not on the electoral roll or !N for all records including Organisations but excluding those not on the Edited Roll.				■	
DateOfBirth	10	The residents date of birth if known (electoral roll attainers in the last 10 years only).				■	
Residency	6	Gives time in years that the occupant has lived at this address.				■	
HouseholdComposition	106	Describes the household composition of the selected address [6]				■	
Standard Address Fields (Formatted as an address would appear on an envelope)							
Organisation	120	Full business name (includes any department)			■	■	■
Property	120	Property (building-includes any sub-building).			■	■	■
Street	120	Delivery Street (includes any sub-street)	■	■	■	■	■
Locality	70	Locality (sometimes a village name – in ZipAddress used for Urbanization)	■	■	■	■	■
Town	30	Postal Delivery Town (or City)	■	■	■	■	■
Postcode	10	The Royal Mail Postcode for this address (or ZipCode)	■	■	■	■	■

Raw PAF Fields (Formatted closer to how they appear on Raw PAF, useful if your database stores fields this way)							
OrganisationName	60	Business Name			■	■	■
Department	60	Department Name			□	■	
Sub Building	60	Sub Building Name			■	■	
Building	60	Building Name			■	■	■
Number	10	House Number			■	■	■
DependentThoroughfare	60	Sub-Street Name	■	■	■	■	
Thoroughfare	60	Street Name	■	■	■	■	■
DoubleDependentLocality	35	Sub-Locality Name	■	■	■	■	
DependentLocality	35	Locality Name (Urbanization in ZipAddress)	■	■	■	■	■
Town	30	Postal Delivery Town (City)	■	■	■	■	■
Postcode	10	The Royal Mail Postcode for this address (or Zipcode)	■	■	■	■	■
BS7666 Fields (Fields to help provide addresses which conform to BS 7666-5:2006)							
Identifier	8	Provides a unique identifier for the address (the Royal Mail UDPRN)			■	■	
BuildDate	10	Provides the build date, which can be used as the start date, entry date, and update date fields for BS7666.			□	□	□
Administrator	20	Provides the administrator of the gazetteer (AFD).			□	□	□
Language	5	Provides the language (ENG)			□	□	□
Department	60	The name of a department within an organization where required.			■	■	
Organization	60	The Organization Name			■	■	■
SubUnit	60	Sub-Unit of a building where needed			■	■	
BuildingName	60	Building Name where present			■	■	■
BuildingNumber	10	Building Number, including 17A, 17-19, etc.			■	■	■
SubStreet	60	Sub-Street where needed			■	■	
DeliveryStreet	60	Designated Street Name	■	■	■	■	■
SubLocality	60	Sub-Locality where required	■	■	■	■	
DeliveryLocality	60	Locality name (or Urbanization)	■	■	■	■	■
DeliveryTown	30	Postal Town name (or City)	■	■	■	■	■
Code	10	The Postcode (or ZipCode)	■	■	■	■	■

County Fields *(Counties are Optional for addressing and AFD provide different types of county to meet your needs – all supply State Abbreviation in ZipAddress)*							
Postal County	30	Royal Mail supplied postal county	■	■	■	■	■
AbbreviatedPostalCounty	30	Royal Mail approved abbreviation is used where available for the postal county	■	■	■	■	■
OptionalCounty	30	Postal counties including optional ones for most addresses which would otherwise not have a county name.	■	■	■	■	■
AbbreviatedOptionalCounty	30	Royal Mail approved abbreviation is used where available for the optional county	■	■	■	■	■
TraditionalCounty	30	The traditional county name for this postcode	■	■	□	■	■
AdministrativeCounty	30	The administrative county name for this postcode	■	■	□	■	■
Alternative Postcode Fields (Can be used in-place of the Postcode field to provide it as separate parts)							
Outcode	4	The Outcode portion of the Postcode (the portion before the space)	■	■	■	■	
Incode	3	The Incode portion of the Postcode (the portion after the space).	■	■	■	■	
Additional Postal Data Fields							
DPS	2	The Delivery Point Suffix which along with the postcode uniquely identifies the letterbox.			□	■	
PostcodeFrom	8	Used with Postcode field to provide a range for searching. Also returns any changed postcode from a lookup.	□	□	■	■	
PostcodeType	6	L for Large User Postcode, S for Small User.	□	□	□	■	
MailsortCode	5	Used for obtaining bulk mail discounts.	□	□	□	■	
UDPRN	8	Royal Mail Unique Delivery Point Reference Number assigned to this letter box.			■	■	
JustBuilt	10	AFDJustBuilt - Contains the date of inclusion on PAF for properties			■	■	

		thought to be recently built. The date is stored numerically in descending format in the form YYYYMMDD. YYYY is the year, MM is the month and DD is the day. For example, 20080304 is 04/03/2008.					
USA Format Address Fields							
Recipient	120	The Recipient name were held (usually Organisation).			■	■	■
Secondary	120	Secondary address details (usually a building name or apartment)			■	■	■
Primary	120	Primary address details (usually a street number and name)	■	■	■	■	■
Urbanization	60	Urbanization (applies only to Puerto Rico – returns Locality for UK addresses)	■	■	■	■	■
City	30	Official City name for the address (Town for UK addresses)	■	■	■	■	■
State	30	State Abbreviation (e.g., WA, returns Postal County for UK addresses)	■	■	■	■	■
ZipCode	20	Full Zip+4 Code for this address (Postcode for UK addresses)	■	■	■	■	■
International Address Fields							
Country	30	Specifies the name of the country to search for when using International data and returns the name of the country that the result returned was for.	■	■	■	■	■
CountryISO	3	Specifies the ISO code of the country to search for when using International data and returns the code for the country the result returned was for.	■	■	■	■	■
Address1…7	120	These fields provide a formatted address ready to print on an address label and so eliminate the need to format the address afterwards (as the rules differ from country to country).	■	■	■	■	■
Principality	60	This is the principality for the address if applicable.	■	■	■	■	
Region	60	This is the region for the address if applicable.	■	■	■	■	

Cedex	60	This specifies the Cedex if applicable to the address.	■	■	■	■	
Phone Number Related Fields							
Phone	20	STD Code or Phone Number	■ [3]	■ [3]	■ [3]	■	
Geographical Fields							
GridE	10	Grid Easting as a 6-digit reference		□	■	■	
GridN	10	Grid Northing as a 6/7-digit reference		□	■	■	
Latitude	10	Latitude representation of Grid Reference in Decimal Format (WGS84)		□	■	■	
GBGridE	10	UK Based Grid Easting as a 6-digit reference. Always returns the UK based grid even for Northern Ireland addresses.		□	■	■	
GBGridN	10	UK Based Grid Northing as a 6/7-digit reference.		□	■	■	
NIGridE	10	Irish Grid Based Grid Easting as a 6-digit reference. Always returns the Irish base grid even for mainland UK addresses.		□	■	■	
NIGridN	10	Irish Grid Based Grid Northing as a 6/7-digit reference.		□	■	■	
Longitude	10	Longitude representation of Grid Reference in Decimal Format (WGS84)		□	■	■	
Miles	6	Distance from supplied grid reference			■	■	
Km	6	Distance from supplied grid reference			■	■	
UrbanRuralCode	2	Provides a code which indicates if an area is mainly urban or rural and how sparsely populated those areas are. [11]			□	■	
UrbanRuralName	60	Provides a description which goes along with the UrbanRuralCode.			□	■	
SOALower	9	Lower level Super Output Area (Data Zone in Scotland, Super Output Area in Northern Ireland)			□	■	
SOAMiddle	9	Middle level Super Output Area (Intermediate Geography in			□	■	

		Scotland, not applicable for Northern Ireland).					
SubCountryName	20	Provides the devolved or non-UK country name (e.g., England, Scotland, Wales etc.)			□	■	
Administrative / Electoral Division Fields							
WardCode	9	Code identifying the electoral ward for this postcode			□	■	
WardName	50	Name identifying the electoral ward for this postcode			□	■	
AuthorityCode	9	Local/Unitary Authority for this Postcode (same as the start of the ward code).			□	■	
Authority	50	Local / Unitary Authority for this postcode			□	■	
ConstituencyCode	9	Parliamentary Constituency Code for this postcode			□	■	
Constituency	50	Parliamentary Constituency for this postcode			□	■	
DevolvedConstituencyCode	9	Devolved Constituency Code for this postcode (currently covers Scotland)			□	■	
DevolvedConstituencyName	50	Devolved Constituency Name for this postcode (currently covers Scotland)			□	■	
EERCode	9	Code identifying the European Electoral Region for this postcode			□	■	
EERName	40	Name identifying the European Electoral Region for this postcode			□	■	
LEACode	3	Code identifying the Local Education Authority for this postcode			□	■	
LEAName	50	Name identifying the Local Education Authority for this postcode			□	■	
TVRegion	30	ISBA TV Region (not TV Company)			□	■	
Postcode Level Property Indicator Fields							
Occupancy	6	Indication of the type of occupants of properties found on the selected postcode [4]	□	□	□	■	
OccupancyDescription	30	Description matching the Occupancy [4]	□	□	□	□	

AddressType	6	Indication of the type of property level data to capture to have the full address for a property on the selected postcode. [5]	☐	☐	☐	■	
AddressTypeDescription	55	Description matching the Address Type [5]	☐	☐	☐	☐	
NHS Fields							
NHSCode	6	National Health Service Area Code			☐	■	
NHSName	50	National Health Service Area Name			☐	■	
PCTCode	9	National Health Service Clinical Commisioning Group Code for England (Local Health Board Code in Wales, Community Health Partnership in Scotland, Local Commissioning Group in Northern Ireland, Primary Healthcare Directorate in the Isle of Man)			☐	■	
PCTName	50	Name matching the PCT Code field			☐	■	
Censation Data Fields (See Main product Manual for full details of Censation Codes and there meaning).							
CensationCode	10	Censation Code assigned to this Postcode	☐	☐	☐	■	
CensationLabel	50	Provides a handle for the Censation Code	☐	☐	☐	■	
Affluence	30	Affluence description	☐	☐	☐	■	
Lifestage	100	LifeStage description	☐	☐	☐	■	
AdditionalCensusInfo	200	Additional information from the Census.	☐	☐	☐	■	
Additional Organisation Information Fields							
Business	100	Provides a description of the type of business				■	
SICCode	10	Standard Industry Classification Code for an organisation record.				■	
Size	6	Gives an indication of the number of employees of an organisation at this particular office. [7]				■	
LocationType	6	The type of Business Location, e.g., Head Office or Branch Office				■	
BranchCount	6	The number of branches for this business				■	

GroupID	6	An ID of the Group where a business is part of a wider group				■	
ModelledTurnover	15	The modelled annual turnover for the business				■	
NationalSize	6	Gives an indication of the number of employees of an organisation covering all sites. [7]				■	
Alias Localities (Non-postally required Localities)							
AliasLocalities	4	Returns the number of alias records present for the postcode sector in which this result resides.			☐	☐	
AliasLocality	35	Returns an alias (non-postal) locality that resides in the postcode sector that this address is contained in. Note that many postcode sectors have multiple alias localities and as such you can include this field multiple times to return multiple localities.			☐	☐	
USA Specific Fields							
RecordType	30	Returns a description for the type of address record returned. [12]					☐
CarrierRouteID	4	Required for bulk mailings					☐
LACSStatus	2	Indicates if the address is available on the LACSLink system for obtaining new addresses.					☐
FinanceNumber	7	The USPS Finance Number for this location					☐
CongressionalDistrict	3	The congressional district of this address					
CountyNumber	4	The USPS assigned number for this county					☐
CountyName	26	The name of the county for this address					☐
CityAbbreviation	14	Provides a postally acceptable abbreviation for long city names.					☐
Advanced / Premium Fields							
DataSet	10	With Postcode Plus and Welsh data can be set to 'Welsh" to obtain the Welsh language version of an address in Wales where available. If				■	

		not set, then the English language version will be returned. With TraceMaster this indicates an historic dataset to use [9]					
CouncilTaxBand	6	Provides the Council Tax Band for the selected property. *Requires Names & Numbers*				■	

Notes:

[3] STD Code Only – No Phone Number present

[4] Possible Occupancy values and descriptions are as follows (information in brackets not part of the description):

1. Large User Organisation (Single Organisation on this postcode)
2. Small User Organisation (All the properties on this postcode are likely to be businesses)
3. Mostly Organisations (Most of the properties on this postcode are organisations)
4. Mixed (This postcode contains a mixture of business and residential addresses)
5. Mostly Residential (Most of the properties on this postcode are residential)
6. Residential (All the properties on this postcode are likely to be residential)

[5] Possible Address Type values and descriptions are as follows (information in brackets not part of the description):

1. Numbered (Only a property number needs to be captured)
2. Numbered and Named (This postcode contains a mixture of properties needing a property number and those needing a property name including properties such as 16b)
3. Numbered and Named, Likelihood of Multiple Occupancy (This postcode contains a mixture of properties needing a property number and those needing a property name. Some of the properties on this postcode are likely to contain multiple occupants, e.g., flats).
4. Named (This postcode only contains properties needing a property name).
5. Non-Standard Address Format (This refers to addresses which do not have a street field at all or have multiple street names on the same postcode. This also includes addresses with numbered localities (no street but a house number which goes in with the locality field). It is in-effect a warning to be careful in capturing the property information as it is not in one of the most common address formats).
6. PO Box (This postcode has a PO Box number)
7. No Property Information (Addresses on this postcode have no property information - i.e., capture an Organisation or Resident name only)

[6] The household composition field includes both a number and description and can have any of the following values.

1. 1 Male and 1 Female occupant with different surnames
2. 1 Male and 1 Female occupant with the same surname (married couples)
3. Mixed household
4. More than 2 persons with the same surname (e.g., older families).
5. 1 Male Occupant Only
6. 1 Female Occupant Only
7. More than 7 persons (e.g., old people's home).

[7] The Size property can have any of the following values:

A.	1 to 9 employees
B.	10 to 19 employees
C.	20 to 49 employees
D.	50 to 99 employees
E.	100 to 199 employees
F.	200 to 499 employees
G.	500 to 999 employees
H.	1000+

(If blank then this is unknown or not applicable).

[8] The phone match type will be set to F if the phone number has been matched to the full name of this resident, or S if just to the surname. This can be useful for identifying the bill payer among multiple residents.

[9] DataSet property when used with the Names & Numbers TraceMaster product can currently be any of the following years: 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005 or Current (for the current data). Only one year can be specified at a time and searches/lookups will fail if the specified year has not been installed. New years are automatically accessible when they become available if installed with no change required to the DLL or your application.

[10] The Product field can have any of the following values:
AFD Postcode
AFD Postcode Plotter
AFD Postcode Plus
AFD Names & Numbers
AFD Names & Numbers TraceMaster

[11] The Urban Rural Code differs from England and Wales, Scotland, and Northern Ireland. The possible codes and their meanings are as follows:

England & Wales
1. Urban (Sparse): Falls within Urban settlements with a population of 10,000 or more and the wider surrounding area is sparsely populated
2. Town and Fringe (Sparse): Falls within the Small Town and Fringe areas category and the wider surrounding area is sparsely populated.

3. Village (Sparse): Falls within the Village category and the wider surrounding area is sparsely populated.
4. Hamlet and Isolated Dwelling (Sparse): Falls within the Hamlet and Isolated Dwelling category and the wider surrounding area is sparsely populated.
5. Urban (Less Sparse): Falls within urban settlements with a population of 10,000 or more and the wider surrounding area is less sparsely populated.
6. Town and Fringe (Less Sparse): Falls within the Small Town and Fringe areas category and the wider surrounding area is less sparsely populated.
7. Village (Less Sparse): Falls within the village category and the wider surrounding area is less sparsely populated.
8. Hamlet and Isolated Dwelling (Less Sparse): Falls within the Hamlet & Isolated Dwelling category and the wider surrounding area is less sparsely populated

Scotland
S1. Large Urban Area: Settlement of over 125,000 people.
S2. Other Urban Area: Settlement of 10,000 to 125,000 people.
S3. Accessible Small Town: Settlement of 3,000 to 10,000 people, within 30 minutes' drive of a settlement of 10,000 or more.
S4. Remote Small Town: Settlement of 3,000 to 10,000 people, with a drive time of 30 to 60 minutes to a settlement of 10,000 or more.
S5. Very Remote Small Town: Settlement of 3,000 to 10,000 people, with a drive time of over 60 minutes to a settlement of 10,000 or more.
S6. Accessible Rural: Settlement of less than 3,000 people, within 30 minutes' drive of a settlement of 10,000 or more.
S7. Remote Rural: Settlement of less than 3,000 people, with a drive time of 30 to 60 minutes to a settlement of 10,000 or more.
S8. Very Remote Rural: Settlement of less than 3,000 people, with a drive time of over 60 minutes to a settlement of 10,000 or more.

Northern Ireland
A - E (Urban):
A. Belfast Metropolitan Urban Area
B. Derry Urban Area
C. Large Town: 18,000 and under 75,000 people
D. Medium Town: 10,000 and under 18,000 people
E. Small Town: 4,500 and under 10,000 people
F - H (Rural):
F. Intermediate Settlement: 2,250 and under 4,500 people
G. Village: 1,000 and under 2,250 people
H. Small Village, Hamlet or Open Countryside: Less than 1,000 people.

[12] The record type will be one of the following:

General Delivery
Highrise
Firm
Street
PO Box
Rural Route/Highway Contract
Multi-Carrier Route

Appendix B. BankFinder Fields

■ Field returned by this product and fully searchable.
☐ Field returned by this product, but searchable only through the Search Text field only.

Note: The API Wizard will add one to the default size for development environments that normally use null terminated strings, e.g., C++ and C# to accommodate the null terminator.

Also note that the alternative address formats provided do share some of the same fields where their data is identical, but you should not mix and match other fields between the different formats as this could lead to address corruption. For example, with Standard Address Fields the Street or Locality field could include a street number, whereas with Raw PAF Fields the number would be in the separate Number field.

Field Name	**Default Size**	**Description**	**BankFinder**
General Fields			
Lookup	255	Specify sort code, postcode, and fast-find lookup string's here for lookup operations.	■
ClearingSystem	25	Clearing system for this record [3]	☐
Key	40	Provides a key which can be used to easily retrieve the record again, e.g., when a user clicks on an item in the list box.	■
List	512	Provides a list item formatted to be added to a list box for this record.	☐
Product	40	Provides the product name used [10]	☐
SearchText	255	Specify text to search for within any of the BankFinder fields	■
General Bank Fields			
SortCode	6	Bank's Sortcode	■
BankBIC	8	Bank BIC Code [1]	■
BranchBIC	3	Branch BIC Code [1]	■

SubBranchSuffix	2	Allows a branch to be uniquely identified where there is a cluster of branches sharing the same Sort Code [1]	☐
ShortBranchTitle	27	The official title of the branch	■
FullBranchTitle	105	Extended title for the institution	■
CentralBankCountryCode	2	The ISO Country code for beneficiary banks in other countries	☐
CentralBankCountryName	20	The country name corresponding to the ISO code given.	☐
SupervisoryBodyCode	1	Indicates the supervisory body for an institution that is an agency in any of the clearings. [2]	☐
SupervisoryBodyName	50	The name of the supervisory body [2]	☐
DeletedDate	10	Specifies the date the branch was closed if it is not active	☐
BranchType	20	The branch type - Main Branch, Sub or NAB Branch, Linked Branch	☐
MainBranchSortCode	6	Set for linked branches in a cluster. It identifies the main branch for the cluster. For IPSO records this is set to the branch that would handle transactions for this sortcode when the branch has been amalgamated with another.	☐
Location	60	Where present helps indicate the physical location of the branch.	■
BranchName	35	Defines the actual name or place of the branch	■
AlternativeBranchName	35	An alternative name or place for the branch where applicable.	■
OwnerBankShortName	20	Short version of the name of the Owning Bank	■
OwnerBankFullName	70	Full version of the name of the Owning Bank	■
OwnerBankCode	4	The four-digit bank code of the Owning Bank [1]	☐
***Standard Address Fields** (Formatted as an address would appear on an envelope)*			
Organisation	120	Owner Bank Full Name	■
Property	65	Bank Postal Address: Property (Building)	☐
Street	60	Bank Postal Address: Street	☐
Locality	60	Bank Postal Address: Locality	☐
Town	30	Bank Postal Address: Town	■
County	30	Bank Postal Address: County (Optional)	☐
Postcode	8	The Royal Mail Postcode for this address	■
***Raw PAF Fields** (Formatted closer to how they appear on Raw PAF, useful if your database stores fields this way)*			

OrganisationName	60	Owner Bank Full Name	■
SubBuilding	60	Bank Postal Address: Sub-Building Name	☐
Building	60	Bank Postal Address: Building Name	☐
Number	10	Bank Postal Address: House Number	☐
DependentThoroughfare	60	Bank Postal Address: Sub-Street Name	☐
Thoroughfare	60	Bank Postal Address: Street Name	☐
Double DependentLocality	35	Bank Postal Address: Sub-Locality Name	☐
DependentLocality	35	Bank Postal Address: Locality Name	☐
Town	30	Bank Postal Address: Postal Delivery Town	■
County	30	Bank Postal Address: County (Optional)	☐
Postcode	8	The Royal Mail Postcode for this address	■
Alternative Postcode Fields *(Can be used in-place of the Postcode field to provide it as separate parts)*			
Outcode	4	The portion of the postcode before the space	■
Incode	3	The portion of the postcode after the space	■
Phone Number Related Fields			
Phone	20	Phone Number for this bank	■
Fax	20	Fax Number for this bank (IPSO only)	☐
BACS Related Fields *(Not applicable to IPSO Records)*			
BACSStatus	5	Indicates the BACS Clearing Status [4]	☐
BACSStatusDescription	60	Provides a description for the status [4]	☐
BACSLastChange	10	Date on which BACS data was last amended	☐
BACSClosedClearing	10	Indicates the date the branch is closed in BACS clearing if applicable.	☐
BACSRedirectedFromFlag	1	Set to R if other branches are redirected to this sort code.	☐
BACSRedirectedToSortCode	6	This specifies the sort code to which BACS should redirect payments addressed to this sort code if applicable.	☐
BACSSettlementBankCode	4	BACS Bank Code of the bank that will settle payments for this branch.	☐
BACSSettlementBankShortName	20	Short form name of the settlement bank	☐
BACSSettlementBankFullName	70	Full form name of the settlement bank	☐
BACSSettlementBankSection	2	Numeric data required for BACS to perform its settlement.	☐
BACSSettlementBankSubSection	2	Numeric data required for BACS to perform its settlement.	☐
BACSHandlingBankCode	4	BACS Bank Code of the member that will take BACS output from this branch.	☐
BACSHandlingBankShortName	20	Short form name of the handling bank	☐
BACSHandlingBankFullName	70	Full form name of the handling bank	☐

BACSHandlingBankStream	2	Numeric code defining the stream of output within the Handling Bank that will be used or payments to this branch.	☐
BACSAccountNumbered	1	Set to 1 if numbered bank accounts are used	☐
BACSDDIVoucher	1	Set to 1 if Paper Vouchers have to be printed for Direct Debit Instructions.	☐
BACSDirectDebits	1	Set to 1 if branch accepts Direct Debits	☐
BACSBankGiroCredits	1	Set to 1 if branch accepts Bank Giro Credits	☐
BACSBuildingSocietyCredits	1	Set to 1 if branch accepts Building Society Credits.	☐
BACSDividendInterestPayments	1	Set to 1 if branch accepts Dividend Interest Payments.	☐
BACSDirectDebitInstructions	1	Set to 1 if branch accepts Direct Debit Instructions.	☐
BACSUnpaidChequeClaims	1	Set to 1 if branch accepts Unpaid Cheque Claims.	☐
CHAPS Related Fields *(Not applicable to IPSO Records)*			
CHAPSPStatus	1	Indicates the CHAPS Sterling clearing Status [5]	☐
CHAPSPStatusDescription	80	Provides a description for the status [5]	☐
CHAPSPLastChange	10	Date on which CHAPS Sterling data was last amended	☐
CHAPSPClosedClearing	10	Indicates the date the branch is closed in CHAPS Sterling clearing if applicable.	☐
CHAPSPSettlementBankCode	3	CHAPS ID of the bank that will settle payments for this branch,	☐
CHAPSPSettlementBankShortName	20	Short form of the name of the settlement bank	☐
CHAPSPSettlementBankFullName	70	Full form of the name of the settlement bank	☐
CHAPSEStatus	1	Indicates the CHAPS Euro clearing Status [6]	☐
CHAPSEStatusDescription	80	Provides a description for the status [6]	☐
CHAPSELastChange	10	Date on which CHAPS Euro data was last amended	☐
CHAPSEClosedClearing	10	Indicates the date the branch is closed in CHAPS Euro clearing if applicable.	☐
CHAPSEEuroRoutingBICBank	8	Specifies the SWIFT closed user group Bank BIC to which CHAPS Euro payments for this branch should be routed.	☐
CHAPSEEuroRoutingBICBranch	3	Specifies the SWIFT closed user group Branch BIC to which CHAPS Euro payments for this branch should be routed.	☐
CHAPSESettlementBankCode	3	CHAPS ID of the bank that will settle payments for this branch.	☐

CHAPSESettlementBankShortName	20	Short form of the name of the settlement bank	☐
CHAPSESettlementBankFullName	70	Full form of the name of the settlement bank	☐
CHAPSEReturnIndicator	1	Set to R if this is the branch to which CHAPS Euro payments should be sent.	☐
C&CCC Related Fields *(Not applicable to IPSO Records)*			
CCCCStatus	1	Indicates the C&CCC clearing Status [7]	☐
CCCCStatusDescription	40	Provides a description for the status [7]	☐
CCCCLastChange	6	Date on which C&CCC data was last amended	☐
CCCCClosedClearing	30	Indicates the date the branch is closed in C&CCC clearing if applicable.	☐
CCCCSettlementBankCode	3	BACS generated code of the bank that will settle payments for this branch.	☐
CCCCSettlement BankShortName	20	Short form of the name of the settlement bank	☐
CCCCSettlement BankFullName	70	Full form of the name of the settlement bank	☐
CCCCDebitAgencySortCode	50	When the Status field is set to 'D' this specifies where cheque clearing is handled for this branch.	☐
CCCCReturnIndicator	6	Set if this is the branch that other banks should return paper to. It will only be set for a sort code of a Member.	☐
Validation Related Fields			
AccountNumber	12	The account number to validate (set along with the sort code field for account number validation).	■
TypeOfAccount	1	The type of account field required for transmitting data to BACS when the account number has been translated.	☐
RollNumber	20	For some building society credit accounts a roll number is required. This can be specified here for validation.	■
IBAN	50	The International Bank Account Number. This contains the sort code and account number in a standardised format for cross-border transactions.	■
BuildingSocietyName	70	For building society accounts requiring a roll number this will contain the name of the recieving building society as this sometimes	☐

		differs from the bank branch that the payment passes through.	
CardNumber	20	Used to specify a card number to validate	■
ExpiryDate		Optional field to specify an expiry date to validate along with the card number.	■
CardType	30	Indicates the card type following validation [8]	□

Notes:

[1] Does not apply to records in the IPSO (Irish Payment Services Organisation) clearing system.

[2] The supervisory body code and name can be any of the following:

A.	Bank of England
B.	Building Society Commission
C.	Jersey, Guernsey or Isle of Man authorities
D.	Other

[3] The clearing system property can have one of the following values

United Kingdom (BACS) – For branch records for the UK clearing system.
Ireland (IPSO) – For branch records on the Irish Payment Services Organisation Clearing System.
Both UK and Irish – Returned by Account Number Validation only when a branch is on both systems.

Note, that you should only accept account numbers validated on the Irish system if you can clear through both the Irish (IPSO) system as well as the UK (BACS) system.

[4] Possible values for the BACS Status and Description fields are as follows:

M.	Branch of a BACS Member
A.	Branch of an Agency Bank
I.	Member of the Irish Clearing Services (IPSO)
N.	Does not accept BACS Payments

[5] Possible values for the CHAPS Sterling Status and Description fields are as follows:

M.	Direct Branch of a CHAPS £ Member that Accepts CHAPS £ Payments
A.	Branch of an Agency Bank that Accepts CHAPS £ Payments
I.	Indirect Branch of a Member or Agency Bank that Accepts CHAPS £ Payments
N.	Does not accept CHAPS £ Payments

[6] Possible values for the CHAPS Euro Status and Description fields are as follows:

D.	Direct Branch of a CHAPS € Member that Accepts CHAPS € Payments
I.	Indirect Branch of a Member or Agency Bank that Accepts CHAPS € Payments

N. Does not accept CHAPS € Payments

[7] Possible values for the C&CCC Status and Description fields are as follows:

M.	Branch of a C&CCC Member
F.	Full Agency Bank Branch
D.	Debit Agency Branch Only
N.	Not Part of the C&CCC Clearing

[8] Possible values for the card type field are as follows:
MasterCard
Visa
American Express
Visa Debit
Electron
Visa Purchasing
UK Maestro
International Maestro
Solo and Maestro
JCB
Charities Aid Foundation
MasterCard Debit

[10] The Product field would have the value ‘AFD BankFinder’.

Appendix C. Nearest Fields

■ Field returned by this product and can be used in a Lookup.
□ Field returned by this product, but not searchable.

Field Name	Default Size	Description	Nearest
General Fields			
Lookup	255	Used to specify the string to process	■
GBGridE	10	Provides the Grid Easting value for the nearest record or a Grid Easting to lookup if no lookup string is supplied.	■
GBGridN	10	Provides the Grid Northing value for the nearest record or a Grid Easting to lookup if no lookup string is supplied.	■
NIGridE	10	Provides the Grid Easting value on the Irish Grid System.	■
NIGridN	10	Provides the Grid Northing value on the Irish Grid System.	■
Latitude	10	Latitude representation of Grid Reference in Decimal Format (WGS84)	■
Longitude	10	Longitude representation of Grid Reference in Decimal Format (WGS84)	■
TextualLatitude	15	A textual representation of the Latitude field	□
TextualLongitude	15	A textual representation of the Longitude field	□
Km	10	Distance of this record from supplied grid reference in kilometres, or the maximum distance to return records for.	■
Miles	10	Distance of this record from supplied grid reference in miles, or the maximum distance to return record for.	■
List	512	Provides a list item formatted to be added to a list box for this record.	□
Key	40	Provides a key which can be used to easily retrieve the record again, e.g., when a user clicks on an item in the list box.	□
Product	40	Indicates the product name used	□
MaxRecords	5	Specifies the maximum number of records to return.	□

In addition to these all the fields contained in the database table that you are using with Nearest are also returned and are fully searchable when using the Search operation.

Appendix D. List Fields

■ Field returned by this product and fully searchable.
□ Field returned by this product, but not searchable.

All List Operations:

Field Name	Default Size	Description	String
General Fields			
Lookup	255	For an alias locality lookup this specifies the postcode or record key to find the alias localities for. With Names & Numbers Field Lists this specifies that only those entries starting with this string should be returned.	■
List	255	Returns each list entry	□
Product	40	Indicates the product name used	□

Appendix E. Utility Fields

■ Field returned by this product and fully searchable.
☐ Field returned by this product, but not searchable.

Grid Utility:

Field Name	**Default Size**	**Description**	**String**
General Fields			
Lookup	255	Used to specify the string to process	■
GBGridE	10	Grid Easting Reference - GB Grid	■
GBGridN	10	Grid Northing Reference - GB Grid	■
NIGridE	10	Grid Easting Reference - Irish Grid	■
NIGridN	10	Grid Northing Reference - Irish Grid	■
Latitude	10	Latitude representation of Grid Reference in Decimal Format (WGS84)	■
Longitude	10	Longitude representation of Grid Reference in Decimal Format (WGS84)	■
TextualLatitude	15	Latitude representation of Grid Reference in Direction, Degrees, Minutes and Seconds	■
TextualLongitude	15	Latitude representation of Grid Reference in Direction, Degrees, Minutes and Seconds	■
Km	6	Specifies the string to search for	■
Miles	6	Specifies the string to replace occurrences of Search with.	■
GBGridEFrom	10	Grid Easting Reference - GB Grid – used to specify two points for a distance calculation	■
GBGridNFrom	10	Grid Northing Reference - GB Grid – used to specify two points for a distance calculation	■
NIGridEFrom	10	Grid Easting Reference - Irish Grid – used to specify two points for a distance calculation	■
NIGridNFrom	10	Grid Northing Ref. - Irish Grid – used to specify two points for a distance calculation	■
LatitudeFrom	10	Latitude representation of Grid Reference in Decimal Format (WGS84) – used to specify two points for a distance calculation	■
LongitudeFrom	10	Longitude representation of Grid Reference in Decimal Format (WGS84) – used to specify two points for a distance calculation	■

TextualLatitudeFrom	15	Latitude representation of Grid Reference in Direction, Degrees, Minutes and Seconds – used to specify two points for a distance calculation	■
TextualLongitudeFrom	15	Latitude representation of Grid Reference in Direction, Degrees, Minutes and Seconds – used to specify two points for a distance calculation	■

Email Utility:

Field Name	**Default Size**	**Description**	**Email**
Email Field			
Email	255	The Email Address to validate	■

String Utility – Depreciated and Unsupported:

Field Name	**Default Size**	**Description**	**String**
General Fields			
Lookup	255	Used to specify the string to process	■
Postcode	10	Provides the postcode output where applicable	☐
Outcode	4	Provides the outcode portion of the postcode where applicable.	☐
Incode	3	Provides the incode portion of the postcode where applicable.	☐
County	30	Provides the abbreviated county name where applicable.	☐
Search	255	Specifies the string to search for	☐
Replace	255	Specifies the string to replace occurrences of Search with.	☐

Appendix F. Refiner Address Fields

When cleaning an address, you can use any of the address fields in the structure to specify the address. These do not need to match up to the actual fields, for example if you have Address Line 1, Address Line 2, Address Line 3 and Postcode in your database you could set these to Property, Street, Locality and Postcode fields in the structure and they will be cleaned and returned in the correct named fields when matched.

The address fields that you can use to specify the address to be cleaned are as follows:

Standard Fields
Organisation
Property
Street
Locality
Town
PostalCounty
AbbreciatedPostalCounty
OptionalCounty
AbbreviatedOptionalCounty
TraditionalCounty
AdministrativeCounty
Postcode

Raw Fields
Department
OrganisationName
SubBuilding
Building
Number
DependantThoroughfare
Thoroughfare
DoubleDependantLocality
DependantLocality
Town
PostalCounty

AbbreciatedPostalCounty
OptionalCounty
AbbreviatedOptionalCounty
TraditionalCounty
AdministrativeCounty
Postcode

BS7666 Fields
Department
Organization
SubUnit
BuildingName
BuildingNumber
SubStreet
DeliveryStreet
SubLocality
DeliveryLocality
DeliveryTown
PostalCounty
AbbreciatedPostalCounty
OptionalCounty
AbbreviatedOptionalCounty
TraditionalCounty
AdministrativeCounty
Code

Large Number of Address Lines

If you have more address lines then a normal address will allow you can still send these to the Refiner API simply by making use of all the county fields in order, for example with standard fields:

Address Line 1	=	Organisation
Address Line 2	=	Property
Address Line 3	=	Street
Address Line 4	=	Locality
Address Line 5	=	Town

Address Line 6	=	PostalCounty
Address Line 7	=	AbbreciatedPostalCounty
Address Line 8	=	OptionalCounty
Address Line 9	=	AbbreviatedOptionalCounty
Address Line 10	=	TraditionalCounty
Address Line 11	=	AdministrativeCounty
Address Line 12	=	Postcode

If your address lines are too long for the default lengths (e.g. County fields are only 30 characters long) you can increase these in your Field Specification as required.

Cleaned Address

Refiner will always output the cleaned data in the correct fields for the format you have selected. You can write the data back to your database in any form that you wish.

Appendix G. BS7666-5:2006

When using AFD Address Management products the Common API has the option to return an address in BS7666 format. You should note that this is the proposed BS7666 Part 5 (BS 7666-5:2006) and AFD will ensure that any necessary changes are made to conform to the final specification for Part 5 of BS7666 when it is released.

The proposed Part 5 of the BS7666 specification is the one which is intended for a delivery point gazetteer and so is designed to provide a standard for postal addresses of the type which AFD Software provides. Older standards such as BS 7666-3:2000 dealt with address specification but these were not specific to postal addresses and as such were not suitable for providing address data.

You should note that, strictly speaking, only AFD Postcode Plus is a delivery point gazetteer which can comply with this standard, as it contains addresses at delivery point level. However, both AFD Names & Numbers and AFD Postcode can also return fields in this format which can be used to aid BS7666 compliance in your address database. AFD Names & Numbers contains these compliant addresses along with additional Name data.

This appendix explains how to use the fields returned by the Common API in this address format to capture addresses compliant with this standard.

Gazetteer MetaData

You will require the following Gazetteer MetaData to use for compliance with the proposed BS7666-5:2006:

Field	**Value**
Name	"Postal Delivery Point Gazetteer"
Scope	"Premises receiving a postal delivery from Royal Mail"
Territory of Use	"Great Britain, Northern Ireland, Isle of Man and Channel Islands"
Gazetteer Owner	"AFD Software Ltd"
Custodian	"AFD Software Ltd"
Coordinate System	"National Grid of Great Britain"
Spatial Referencing System	"Postal Address"

Current Date	<Use the BuildDate Field from AFDData>
Language	"ENG"

Delivery Point Records

For each delivery point record returned from a Lookup or Search in the AFD data the following shows how the BS7666 fields returned correlate to those in the proposed BS7666-5:2006 standard:

Field	**AFD Field To Use**
Identifier	Identifier
Start Date	BuildDate – AFD products are a complete data refresh so they come into use at the build date.
Entry Date	BuildDate – You may wish to change this to the date you input an address onto your database.
Update Date	BuildDate – You may wish to change this to the date you update an address onto your database.
Position	
X	GBGridE
Y	GBGridN
Spatial Reference	
Identifier	Identifier
Language	Language
Department	Department
Organization	Organization
Sub-Unit	SubUnit
Building Name	BuildingName
Building Number	BuildingNumber
Sub-Street	SubStreet
Delivery Street	DeliveryStreet
Sub-Locality	SubLocality
Delivery Locality	DeliveryLocality
Delivery Town	DeliveryTown
County	*This is an optional attribute and if you wish to include a County you can use any of the County fields defined in Appendix A as you desire.*
Code	Code
Administrator	Administrator

Data Quality Report

For BS 7666-5:2006 compliance a data quality report is now also required.

Lineage
The delivery point information present in AFD Postcode Plus is derived from the Royal Mail Postcode Address File, with updates provided on a quarterly or annual basis depending on if you have purchased quarterly updates. The data in the Royal Mail Postcode Address File is included in its entirety however is processed to conform to the BS 7666-5:2006 standard, which PAF in it's raw form does not comply with. In AFD Names & Numbers additional postal delivery points are also available which are obtained from Electoral Roll data but which do not appear on PAF.

Currency
This date is specified by the BuildDate Field of the AFDData structure.

Positional Accuracy
Using the default DataTalk GeoRef grid references, the co-ordinates of the gazetteer are to a 10m resolution. These provide the approximate location of the postcode for which the address falls.

If using Royal Mail Postzon grid references, the co-ordinates of the gazetteer are to 100m resolution and are provided by the Gridlink® consortium (of which the Office of National Statistics (ONS), Ordnance Survery (OS), Ordnance Survey of Northern Ireland (OSNI), the General Register Office for Scotland (GROS) and Royal Mail are all a part). These are generally given as the top left of the 100m square for which the property at the centre of the postcode falls. They are constantly verified and updated, and full details of their accuracy should be obtained from GridLink members if required.

If accuracy is important, and for a resolution within 1m of the postcode, Ordnance Survey CodePoint grids are an optional extra for address management products and are used in-place of GeoRef/Postzon grid references.

Attribute Accuracy
The data in AFD Postcode Plus is accurate in that it contains all postal delivery points held by Royal Mail. Royal Mail PAF is quoted as being 96.1% accurate in 2003 and a new accuracy measure is being developed which should be able to provide a better picture of its accuracy. AFD Names &

Numbers contains Royal Mail PAF data to the same accuracy along with additional addresses present on the Electoral Roll but not in PAF.

Completeness

The data in AFD Postcode Plus is accurate and contains 100% of PAF records with no duplicates and tests against the original PAF data are carried out to verify this. Royal Mail PAF is quoted as being 96.1% accurate and that reflects its completeness too – a better break down should be available once Royal Mail have developed a new accuracy measure. AFD Names & Numbers contains Royal Mail PAF data to the same accuracy, and additional addresses are presented as complete as is possible – no independent measure of that accuracy is available. They may well be duplicate addresses on AFD Names & Numbers as they cannot be matched to PAF but may identify the same delivery point.

Logical Consistency

The records in the data have been tested against the specification for the gazetteer to ensure that all are recorded in a consistent manual. This was done with both fully automated tests, and manually sampling addresses to ensure the format they appear is both consistent with the proposed BS 7666-5:2006 standard and with the other addresses present.

Appendix H. Grid References

AFD Postcode Plotter, AFD Postcode Plus, AFD Names & Numbers, and AFD Names & Numbers TraceMaster all contain grid references. DataTalk GeoRef is a Postcode level grid reference data supplied by AFD for distance calculations, nearest calculations, and data / location analysis. It is made up of a six-digit Easting and a six-digit Northing. This reference relates the location of the Postcode to the National Grid (or Irish Grid for Northern Ireland Postcodes (start with BT).

DataTalk GeoRef is a good alternative to Postzon. However, Postzon, Code Point and Address Point data options are available at additional cost.

The grid references returned by these products are available in the following Fields:

GridE, GridN

This pair of grid references denotes the grid reference for the postcode on the National Grid of Great Britain for all postcodes other than those in Northern Ireland. For Northern Ireland the grid reference is returned in the Irish grid. The Grid References are provided as a 6-digit grid northing (7 digits for some northernmost parts of Scotland) and a 6-digit grid easting.

GBGridE, GBGridN

This pair of grid references denotes the grid reference for the postcode on the National Grid of Great Britain. This is used for all addresses in England, Scotland and Wales and can also be convenient to use for addresses in Northern Ireland in order to provide a common baseline with the rest of the UK. The Grid References are provided as a 6-digit grid northing (7 digits for some northernmost parts of Scotland) and a 6-digit grid easting.

NIGridE, NIGridN

This pair of grid references denotes the grid reference for the postcode on the Irish Grid System. This is used for all addresses in Northern Ireland, and a conversion is provided for addresses in the rest of the UK so it can be used as a common baseline if preferred for companies operating mainly in Northern Ireland. The Grid References are provided as a 6-digit grid northing and a 6-digit grid easting.

Latitude, Longitude

This pair of latitude and longitude values are provided in decimal format to four decimal places. These values are based on the WGS84 standard - the one in most common usage with GPS systems. However, you should note that these references can only be as good as the grid references that they are converted from.

Textual Latitude, Textual Longitude

These also provide the latitude and longitude values as above, but they are provided in a textual representation which, while being less useful as input to computer related applications, can be more readable to a user as they provide the direction, degrees, minutes and seconds components of the latitude and longitude value for this location.

Appendix I. Setting and Retrieving Fields Individually

Please note that this appendix is applicable to using the Standard API only. When using PostcodeEverywhere XML there is no need to set or retrieve fields individually.

The normal way of working with the Common API is to pass to it a structure or type containing all the fields that you require – you set the relevant fields for a lookup or search and then can read in any of the fields returned in your application. However, there are some development environments which do not support such structures or types and so can make it more difficult to set and retrieve data from the API. In such cases you can often define a single string made up of the number of spaces which equates to the length of the structure required and set and retrieve the appropriate portion of the String to obtain the required field. However, to make this easier the Common API also supports a special mode whereby fields can be assigned and retrieved individually, and this is described in this section.

Specifying the Individual Fields Option

To specify that fields will be retrieved individually, rather than using a structure, you will need to add the option 'F' for individual fields to the field specification string that you are using. See Section 4.13 for more information regarding the Field Specification string. As with the structure, the fields returned will be space padded unless you use the 'X' option which will mean they are returned null terminated instead. It should be noted that any field that you wish to use must be included in your field specification string.

Example VB Declaration for the Field Specification string using individual fields:

```
Public Const afdFieldSpec =
"Address@F@Lookup:255@Name:120@Organisation:120@Property:120@Street:120@Locality:70@Town:30@Postcod
e:10@PostcodeFrom:8@Key:40@List:512"
```

Example C++ Declaration for the Field Specification string using individual fields:

```
static char afdFieldSpec[2048] =
"Address@LXF@Lookup:256@Name:121@Organisation:121@Property:121@Street:121@Locality:71@Town:31@Postcode
:11@PostcodeFrom:9@Key:41@List:513";
```

Setting Fields

To set a field in the structure, for example the Lookup field for carrying out a lookup operation you should specify an operation code of 8 to a call to AFDData. A constant can be defined for this as follows:

Constant	**Value**	**Description**
AFD_FIELD_VALUE	8	Used to set and retrieve individual field values.

You can then call the AFDData function with your field specification string, the AFD_FIELD_VALUE operation parameter, and then the third parameter should be a string of at least 512 characters. This can either be null terminated or space padded to include the name of the field you wish to set followed by the equal's symbol and its value, for example "Lookup=B1 1AA".

***Example VB code to set the lookup field*:**

```
Dim fieldValue As String * 512
Dim retVal As Long
fieldValue = "Lookup=B1 1AA"
retVal = AFDData(afdFieldSpec, AFD_FIELD_VALUE, ByVal fieldValue)
```

Example C++ code to set the lookup field

```
char fieldValue[512];
long retVal;
strcpy(fieldValue, "Lookup=B1 1AA");
retVal = (afdData)(afdFieldSpec, AFD_FIELD_VALUE, fieldValue);
```

Calling the AFDData function to carry out an operation

The AFDData function is called to carry out an operation in exactly the same way as when a structure or type is used. The only difference is that no structure or type is required and as such the third parameter of the call to AFDData can be an empty string, null, or any other value as may be most convenient for the environment you are using as it is not used.

***Example VB code to carry out a fastfind operation*:**

```
retVal = AFDData(afdFieldSpec, AFD_FASTFIND_LOOKUP, "")
```

***Example C++ code to carry out a fastfind operation*:**

```
retVal = (afdData)(afdFieldSpec, AFD_FASTFIND_LOOKUP, NULL);
```

Retrieving Field Values

Retrieving field values is done in a similar way to setting them. Like when you set the fields you should specify the AFD_FIELD_VALUE operation (8) to AFDData.

You can then call the AFDData function with your field specification string, the AFD_FIELD_VALUE operation parameter, and then the third parameter should be a string of at least 512 characters. This can either be null terminated or space padded to include the name of the field you wish to retrieve, for example "Town". This string will be replaced with the actual field value.

Example VB code to retrieve the town field:

```
Dim fieldValue As String * 512
Dim retVal As Long
fieldValue = "Town"
retVal = AFDData(afdFieldSpec, AFD_FIELD_VALUE, ByVal fieldValue)
' fieldValue now contains the Town field for the last result
```

Example C++ code to set the lookup field

```
char fieldValue[512];
long retVal;
strcpy(fieldValue, "Town");
retVal = (afdData)(afdFieldSpec, AFD_FIELD_VALUE, ByVal fieldValue);
// fieldValue now contains the Town field for the last result
```

Clearing the fields

If you are carrying out a search you will want to clear the values of all fields prior to setting your search criteria as otherwise search fields will already have the values of the previous result. This can be achieved quickly by simply specifying the special field 'Clear' to the AFDData function which will clear all fields.

Example VB code to clear all fields:

```
Dim fieldValue As String * 512
Dim retVal As Long
fieldValue = "Clear"
retVal = AFDData(afdFieldSpec, AFD_FIELD_VALUE, ByVal fieldValue)
```

Example C++ code to clear all fields

```
char fieldValue[512];
long retVal;
strcpy(fieldValue, "Clear");
retVal = (afdData)(afdFieldSpec, AFD_FIELD_VALUE, fieldValue);
```

Full Fast Find Example

Given below is a full example which sets and retrieves fields individually for a fast find lookup with Address Management products, adding results to a list box:

Example VB code for an Address Management Lookup:

```
 Dim fieldValue As String * 512, fieldValue2 As String * 512
 Dim retVal As Long
 Static running As Boolean

 ' Prevent corruption of list box from button being clicked twice
 If running Then Exit Sub
 running = True

 ' Replace lstResult with the name of your list box for the results
 With lstResult

 ' Clear out any existing items in the list
 .Clear

 ' Reset Cancel flag
 cancelFlag = False

 ' Set the lookup
 fieldValue = "Lookup=" + txtLookup.Text ' Change to your lookup entry textbox
 retVal = AFDData(afdFieldSpec, AFD_FIELD_VALUE, ByVal fieldValue)

 ' Carry out the lookup (no need to alter the line below, unless you want to add a sector skip option - see
constants)
 retVal = AFDData(afdFieldSpec, AFD_FASTFIND_LOOKUP, "")

 ' Abort with Message if error or user cancelled
 If retVal < 0 Then
   MsgBox AFDErrorText(retVal)
   running = False
   Exit Sub
 End If

 ' Display any changed postcode if applicable
 fieldValue = "PostcodeFrom"
 Call AFDData(afdFieldSpec, AFD_FIELD_VALUE, ByVal fieldValue)
 If Trim(fieldValue) <> "" Then
   fieldValue2 = “Postcode”
   Call AFDData(afdFieldSpec, AFD_FIELD_VALUE, ByVal fieldValue2)
```

```
  MsgBox "Postcode has changed from " + Trim(fieldValue) + " to " + Trim(fieldValue2)
End If

' Now add matching records to the list box
Do While retVal >= 0
  If retVal <> AFD_RECORD_BREAK Then
    ' Add the item to the list box with hidden key at the end
    fieldValue = "List"
    fieldValue2 = "Key"
    Call AFDData(fieldSpecInd, AFD_FIELD_VALUE, ByVal fieldValue)
    Call AFDData(fieldSpecInd, AFD_FIELD_VALUE, ByVal fieldValue2)
    .AddItem fieldValue + fieldValue2
  End If
  ' Give user the chance to cancel and allow list box to update
  DoEvents
  ' Check if user cancelled
  If cancelFlag Then
    MsgBox "Lookup Cancelled"
    running = False
    Exit Sub
  End If
  retVal = AFDData(afdFieldSpec, AFD_GET_NEXT + AFD_FASTFIND_LOOKUP, “”)
Loop

' Check results have been returned
If .ListCount = 0 Then
  MsgBox "No Results Found"
Else
  .ListIndex = 0 ' Select First item in the list
End If

End With

running = False
```

Example C++ Code For an Address Management Lookup (Visual C++)

```
HINSTANCE afdDLL = (HINSTANCE)NULL;
AFDDATA afdData = (AFDDATA)NULL;
static bool running = false;
char fieldValue[512];
char listItem[2055];
char msgTxt[255];
long retVal;
CListBox* listBox;
MSG msg;

// Check if we are already running to prevent crossing over items in the listbox
if (running) return;
running = true;

// Load DLL
if (!afdInitDLL(&afdDLL, &afdData)) {
  MessageBox("Error Loading afddata.dll", "Error", 0);
  return;
}
```

```
 // Replace m_lstResult with the name given to a variable assigned to your list box control for the results
 listBox = &m_lstResult;

 // Clear out any existing items in the list
 listBox->ResetContent();

 // Reset Cancel flag
 cancelFlag = false;

 // Update Data so we can read the lookup variable
 UpdateData(TRUE);

 // Set the lookup
 strcpy(fieldValue, "Lookup=B1 1AA");
 retVal = (afdData)(afdFieldSpec, AFD_FIELD_VALUE, m_txtLookup); // Change this to your lookup entry textbox
value variable

 // Carry out the lookup (no need to alter the line below, unless you want to add a sector skip option - see
constants)
 retVal = (afdData)(afdFieldSpec, AFD_FASTFIND_LOOKUP, NULL);

 // Abort with Message if error or user cancelled
 if (retVal < 0) {
  AFDErrorText(retVal, msgTxt);
  MessageBox(msgTxt, "Error", 0);
  running = false;
  return;
 }

 // Display any changed postcode if applicable
 fieldValue = "PostcodeFrom"
 (afdData)(afdFieldSpec, AFD_FIELD_VALUE, fieldValue);
 if (fieldValue[0] != '\0') {
  strcpy(msgTxt, "Postcode has changed from ");
  strcat(msgTxt, fieldValue);
  strcat(msgTxt, " to ");
  fieldValue = "Postcode"
  (afdData)(afdFieldSpec, AFD_FIELD_VALUE, fieldValue);
  strcat(msgTxt, fieldValue);
  MessageBox(msgTxt, "Changed Postcode", 0);
 }

 // Now add matching records to the list box
 while (retVal >= 0) {
  if (retVal != AFD_RECORD_BREAK) {
   // make up list item with hidden key at the end
   fieldValue = "List"
   (afdData)(afdFieldSpec, AFD_FIELD_VALUE, fieldValue);
   memset(listItem, ' ', 552);
   strncpy(listItem, fieldValue, strlen(fieldValue));
   fieldValue = "Key"
   (afdData)(afdFieldSpec, AFD_FIELD_VALUE, fieldValue);
   strncpy(listItem + 512, fieldValue, strlen(fieldValue));
   listItem[552] = '\0';
   // Add the item to the list box
   listBox->AddString(listItem);
  }
  // Give user the chance to cancel and allow list box to update
  if(PeekMessage(&msg, NULL, 0, 0, PM_REMOVE)) {
    TranslateMessage(&msg);
    DispatchMessage(&msg);
  }
  // Check if user cancelled
  if (cancelFlag) {
    MessageBox("Search Cancelled", "Cancelled", 0);
    return;
  }
  retVal = (afdData)(afdFieldSpec, AFD_GET_NEXT + AFD_FASTFIND_LOOKUP, NULL);
}

// Check results have been returned
if (listBox->GetCount() == 0)
  MessageBox("No Results Found", "Error", 0);
else {
  listBox->SetCurSel(0); // Select First item in the list

  OnSelchangeLstResult(); // Set this to your list change method to simulate selecting the first list item

}

// free DLL instance
FreeLibrary(afdDLL);
afdDLL = (HINSTANCE)NULL;

running = false;
```

Appendix J. PostcodeEverywhere Field Presets

When using the PostcodeEverywhere XML Server the Fields parameter is used to specify the fields which are to be returned in each XML item. However rather than specifying each field by name, a set of presets, are avaliable which includes the relevant fields in the XML. This appendix lists the fields included in each preset for each data type. Note that some fields may never contain any data depending on the product you are using.

Please note that fields may be added in the future as products continue to develop, however fields will not be removed from the preset which will ensure we retain compatibility with your application.

Address Management Products

A description of each of these fields is given in Appendix A

List
Postcode
PostcodeFrom
Key
List

Simple
Name
Organisation
Property
Street
Locality
Town
PostalCounty
AbbreviatedPostalCounty
OptionalCounty
AbbreviatedPostalCounty
AbbreviatedOptionalCounty
TraditionalCounty
AdministrativeCounty

Postcode
DPS
PostcodeFrom
PostcodeType
Phone
Key
List

Standard
Name
Organisation
Property
Street
Locality
Town
PostalCounty
AbbreviatedPostalCounty
OptionalCounty
AbbreviatedPostalCounty
AbbreviatedOptionalCounty
TraditionalCounty
AdministrativeCounty
Postcode
DPS
PostcodeFrom
PostcodeType
MailsortCode
Phone
GridE
GridN
Miles
Km
Latitude
Longitude
JustBuilt
UrbanRuralCode
UrbanRuralName
WardCode

WardName
Constituency
EERCode
EERName
AuthorityCode
Authority
LEACode
LEAName
TVRegion
Occupancy
OccupancyDescription
AddressType
AddressTypeDescription
UDPRN
NHSCode
NHSName
NHSRegionCode (Obsolete)
NHSRegionName (Obsolete)
PCTCode
PCTName
SubCountryName
DevolvedConstituencyCode
DevolvedConstituencyName
CensationCode
Affluence
Lifestage
AdditionalCensusInfo
SOALower
SOAMiddle
Residency
HouseholdComposition
Business
Size
SICCode
LocationType
BranchCount
GroupID
ModelledTurnover

NationalSize
OnEditedRoll
Gender
Forename
MiddleInitial
Surname
DateOfBirth
DataSet
CouncilTaxBand
Product
Key
List

Raw
Name
OrganisationName
Department
SubBuilding
Building
Number
DependentThoroughfare
Thoroughfare
DoubleDependentLocality
DependentLocality
Town
PostalCounty
AbbreviatedPostalCounty
OptionalCounty
AbbreviatedPostalCounty
AbbreviatedOptionalCounty
TraditionalCounty
AdministrativeCounty
Postcode
DPS
PostcodeFrom
PostcodeType
MailsortCode
Phone

GridE
GridN
Miles
Km
Latitude
Longitude
JustBuilt
UrbanRuralCode
UrbanRuralName
WardCode
WardName
Constituency
EERCode
EERName
AuthorityCode
Authority
LEACode
LEAName
TVRegion
Occupancy
OccupancyDescription
AddressType
AddressTypeDescription
UDPRN
NHSCode
NHSName
NHSRegionCode (Obsolete)
NHSRegionName (Obsolete)
PCTCode
PCTName
SubCountryName
DevolvedConstituencyCode
DevolvedConstituencyName
CensationCode
Affluence
Lifestage
AdditionalCensusInfo
Residency

HouseholdComposition
Business
Size
SICCode
LocationType
BranchCount
GroupID
ModelledTurnover
NationalSize

OnEditedRoll
Gender
Forename
MiddleInitial
Surname
DateOfBirth
DataSet
CouncilTaxBand
Product
Key
List

BS7666
Name
Identifier
BuildDate
Administrator
Language
Department
Organization
SubUnit
BuildingName
BuildingNumber
SubStreet
DeliveryStreet
SubLocality
DeliveryLocality
DeliveryTown

PostalCounty
AbbreviatedPostalCounty
OptionalCounty
AbbreviatedPostalCounty
AbbreviatedOptionalCounty
TraditionalCounty
AdministrativeCounty
Code
DPS
PostcodeFrom
PostcodeType
MailsortCode
Phone
GridE
GridN
Miles
Km
Latitude
Longitude
JustBuilt
UrbanRuralCode
UrbanRuralName
WardCode
WardName
Constituency
EERCode
EERName
AuthorityCode
Authority
LEACode
LEAName
TVRegion
Occupancy
OccupancyDescription
AddressType
AddressTypeDescription
UDPRN
NHSCode

NHSName
NHSRegionCode (Obsolete)
NHSRegionName (Obsolete)
PCTCode
PCTName
SubCountryName
DevolvedConstituencyCode
DevolvedConstituencyName
CensationCode
Affluence
Lifestage
AdditionalCensusInfo
SOALower
SOAMiddle
Residency
HouseholdComposition
Business
Size
SICCode
LocationType
BranchCount
GroupID
ModelledTurnover
NationalSize
OnEditedRoll
Gender
Forename
MiddleInitial
Surname
DateOfBirth
DataSet
CouncilTaxBand
Product
Key
List

ZipAddress
Name

Recipient
Secondary
Primary
Urbanization
City
State
ZipCode
RecordType
CarrierRouteID
LACSStatus
FinanceNumber
CongressionalDistrict
CountyNumber
CountyName
CityAbbreviation
PostcodeFrom
Product
Key
List
Country
CountryISO

International
Name
Address1
Address2
Address3
Address4
Address5
Address6
Address7
OrganisationName
Department
SubBuilding
Building
Number
DependentThoroughfare

Thoroughfare
DoubleDependentLocality
DependentLocality
Town
PostalCountry
Postcode
Principality
Region
Cedex
PostcodeFrom
Product
Key
List
Country
CountryISO

Additional Fields for DX Customers

DX Customers with the DX data installed will also get the following additional fields relating to DX with the Simple, Standard, Raw, BS7666, and International Presets:

DXNumber
DXExchange
DXProfession

BankFinder – Except Account and Card Validation

A description of each of these fields is given in Appendix B

List
Key
List

Standard
Lookup
SortCode
BankBIC

BranchBIC
SubBranchSuffix
ShortBranchTitle
CentralBankCountryCode
CentralBankCountryName
SupervisoryBodyCode
SupervisoryBodyName
DeletedDate
BranchType
MainBranchSortCode
Location
BranchName
AlternativeBranchName
FullBranchTitle
OwnerBankShortName
OwnerBankFullName
OwnerBankCode
Organisation
Property
Street
Locality
Town
County
Postcode
Phone
Fax
ClearingSystem
BACSStatus
BACSStatusDescription
BACSLastChange
BACSClosedClearing
BACSRedirectedFromFlag
BACSRedirectedToSortCode
BACSSettlementBankCode
BACSSettlementBankShortName
BACSSettlementBankFullName
BACSSettlementBankSection
BACSSettlementBankSubSection

BACSHandlingBankCode
BACSHandlingBankShortName
BACSHandlingBankFullName
BACSHandlingBankStream
BACSAccountNumbers
BACSDDIVoucher
BACSDirectDebits
BACSBankGiroCredits
BACSBuildingSocietyCredits
BACSDividendInterestPayments
BACSDirectDebitInstructions
BACSUnpaidChequeClaims
CHAPSPStatus
CHAPSPStatusDescription
CHAPSPLastChange
CHAPSPClosedClearing
CHAPSPSettlementBankCode
CHAPSPSettlementBankShortName
CHAPSPSettlementBankFullName
CHAPSEStatus
CHAPSEStatusDescription
CHAPSELastChange
CHAPSEClosedClearing
CHAPSEEuroRoutingBICBank
CHAPSEEuroRoutingBICBranch
CHAPSESettlementBankCode
CHAPSESettlementBankShortName
CHAPSESettlementBankFullName
CHAPSEReturnIndicator
CCCCStatus
CCCCStatusDescription
CCCCLastChange
CCCCClosedClearing
CCCCSettlementBankCode
CCCCSettlementBankShortName
CCCCSettlementBankFullName
CCCCDebitAgencySortCode
CCCCReturnIndicator

Product
Key
List

Raw
Lookup
SortCode
BankBIC
BranchBIC
SubBranchSuffix
ShortBranchTitle
CentralBankCountryCode
CentralBankCountryName
SupervisoryBodyCode
SupervisoryBodyName
DeletedDate
BranchType
MainBranchSortCode
Location
BranchName
AlternativeBranchName
FullBranchTitle
OwnerBankShortName
OwnerBankFullName
OwnerBankCode
OrganisationName
SubBuilding
Building
Number
DependentThoroughfare
Thoroughfare
DoubleDependentLocality
DependentLocality
Town
County
Postcode
Phone
Fax

ClearingSystem
BACSStatus
BACSStatusDescription
BACSLastChange
BACSClosedClearing
BACSRedirectedFromFlag
BACSRedirectedToSortCode
BACSSettlementBankCode
BACSSettlementBankShortName
BACSSettlementBankFullName
BACSSettlementBankSection
BACSSettlementBankSubSection
BACSHandlingBankCode
BACSHandlingBankShortName
BACSHandlingBankFullName
BACSHandlingBankStream
BACSAccountNumbers
BACSDDIVoucher
BACSDirectDebits
BACSBankGiroCredits
BACSBuildingSocietyCredits
BACSDividendInterestPayments
BACSDirectDebitInstructions
BACSUnpaidChequeClaims
CHAPSPStatus
CHAPSPStatusDescription
CHAPSPLastChange
CHAPSPClosedClearing
CHAPSPSettlementBankCode
CHAPSPSettlementBankShortName
CHAPSPSettlementBankFullName
CHAPSEStatus
CHAPSEStatusDescription
CHAPSELastChange
CHAPSEClosedClearing
CHAPSEEuroRoutingBICBank
CHAPSEEuroRoutingBICBranch
CHAPSESettlementBankCode

CHAPSESettlementBankShortName
CHAPSESettlementBankFullName
CHAPSEReturnIndicator
CCCCStatus
CCCCStatusDescription
CCCCLastChange
CCCCClosedClearing
CCCCSettlementBankCode
CCCCSettlementBankShortName
CCCCSettlementBankFullName
CCCCDebitAgencySortCode
CCCCReturnIndicator
Product
Key
List

BankFinder – Account Validation Only

A description of each of these fields is given in Appendix B

Standard
SortCode
AccountNumber
RollNumber
TypeOfAccount
ClearingSystem
BuildingSocietyName

BankFinder – Card Validation Only

A description of each of these fields is given in Appendix B

Standard
CardNumber
ExpiryDate
CardType

Nearest

A description of each of these fields is given in Appendix C

List

Key
List

Standard

Lookup
GBGridE
GBGridN
NIGridE
NIGridN
Latitude
Longitude
TextualLatitude
TextualLongitude
Km
Miles
List
Key
Product
Max Records
…Followed by all your fields in the database table you are using with Nearest.

String Utility - Depreciated

Standard

Lookup
Outcode
Incode
Search
Replace

Grid Utility

Standard

Lookup
GBGridE
GBGridN
NIGridE
NIGridN
Latitude
Longitude
TextualLatitude
TextualLongitude
Km
Miles
GBGridEFrom
GBGridNFrom
NIGridEFrom
NIGridNFrom
LatitudeFrom
LongitudeFrom
TextualLatitudeFrom
TextualLongitudeFrom

Email Utility

Standard
Email

Appendix K. DX Professions

The following is a list of the professions current present in DX data:

Accountant or Auditor
Actuaries
Advertising Agency
Association or Institute
Bailiffs
Bank
Barrister
Betting
Builder
Building Society
Builders merchant
Brewery
Coal Company
Commercial Company
Computer Company
Conveyancer
Court or Sheriff's Office
Crown Prosecution Service
Law Costs Draftsman
Educational Institutions
Electricity Company
Estate Agent
Financial Adviser
Gas Company
Other Government
Health and Medical
Health - Path Pak
Housing Association
Insurance Company or Broker
Insolvency Practitioner
Internal Accounts
Investigation Firm
Licensed Conveyancers

Leisure Company
Borough Council
County Council
City Council
District Council
Legal Aid
Metropolitan Borough Council
Metropolitan City Council
Libraries
Law Society
Legal Services
Legal Training Co
Media Company
Mailing Houses
Newspaper Distributor
National Newspaper
Oil Company
Optical
The Official Receiver
Miscellaneous
Other Legal Services
Publisher
Property Management Agents
Police Force
Printer
Probation Services
Patent Agent
Railways
Recruitment
Regional Newspaper
Retail Company
DX Service Centres
Service Company
Solicitor
Stationer
Stockbroker or Stock Exchange
Industrial Manufacturing Co
Surveyors

Telecommunications
Transport
Travel Agent - Abta
Water Company

Appendix L. Country and Country ISO Codes

The following is a list of the Countries supported by the International data service (Country ISO code and name):

AFG	Afghanistan
ALB	Albania
DZA	Algeria
ASM	American Samoa
AND	Andorra
AGO	Angola
AIA	Anguilla
ATA	Antarctica
ATG	Antigua and Barbuda
ARG	Argentina
ARM	Armenia
ABW	Aruba
AUS	Australia
AUT	Austria
AZE	Azerbaijan
BHS	Bahamas
BHR	Bahrain
BGD	Bangladesh
BRB	Barbados
BLR	Belarus
BEL	Belgium
BLZ	Belize
BEN	Benin
BMU	Bermuda
BTN	Bhutan
BOL	Bolivia
BIH	Bosnia and Herzegovina
BWA	Botswana
BVT	Bouvet Island
BRA	Brazil
IOT	British Indian Ocean Territory
VGB	British Virgin Islands

BRN	Brunei Darussalam
BGR	Bulgaria
BFA	Burkina Faso
BDI	Burundi
KHM	Cambodia
CMR	Cameroon
CAN	Canada
CPV	Cape Verde
CYM	Cayman Islands
CAF	Central African Republic
TCD	Chad
CHL	Chile
CHN	China
CXR	Christmas Island
CCK	Cocos Keeling Islands
COL	Colombia
COM	Comoros
COG	Congo
COK	Cook Islands
CRI	Costa Rica
HRV	Croatia
CUB	Cuba
CYP	Cyprus
CZE	Czech Republic
COD	Democratic Republic of Congo
DNK	Denmark
DJI	Djibouti
DMA	Dominica
DOM	Dominican Republic
TMP	East Timor
ECU	Ecuador
EGY	Egypt
SLV	El Salvador
GNQ	Equatorial Guinea
ERI	Eritrea
EST	Estonia
ETH	Ethiopia
FRO	Faeroe Islands

FLK	Falkland Islands
FJI	Fiji
FIN	Finland
FRA	France
GUF	French Guiana
PYF	French Polynesia
ATF	French Southern Territories
GAB	Gabon
GMB	Gambia
GEO	Georgia
DEU	Germany
GHA	Ghana
GIB	Gibraltar
GRC	Greece
GRL	Greenland
GRD	Grenada
GLP	Guadeloupe
GUM	Guam
GTM	Guatemala
GIN	Guinea
GNB	Guinea-Bissau
GUY	Guyana
HTI	Haiti
HMD	Heard and Mc Donald Islands
HND	Honduras
HKG	Hong Kong
HUN	Hungary
ISL	Iceland
IND	India
IDN	Indonesia
IRN	Iran
IRQ	Iraq
IRL	Ireland
ISR	Israel
ITA	Italy
CIV	Ivory Coast
JAM	Jamaica
JPN	Japan

JOR	Jordan
KAZ	Kazakhstan
KEN	Kenya
KIR	Kiribati
KOS	Kosovo
KWT	Kuwait
KGZ	Kyrgyzstan
LAO	Laos
LVA	Latvia
LBN	Lebanon
LSO	Lesotho
LBR	Liberia
LBY	Libya
LIE	Liechtenstein
LTU	Lithuania
LUX	Luxembourg
MAC	Macau
MKD	Macedonia
MDG	Madagascar
MWI	Malawi
MYS	Malaysia
MDV	Maldives
MLI	Mali
MLT	Malta
MHL	Marshall Islands
MTQ	Martinique
MRT	Mauritania
MUS	Mauritius
MYT	Mayotte
MEX	Mexico
FSM	Micronesia
MDA	Moldova
MCO	Monaco
MNG	Mongolia
MNE	Montenegro
MSR	Montserrat
MAR	Morocco
MOZ	Mozambique

MMR	Myanmar
NAM	Namibia
NRU	Nauru
NPL	Nepal
NLD	Netherlands
ANT	Netherlands Antilles
NCL	New Caledonia
NZL	New Zealand
NIC	Nicaragua
NER	Niger
NGA	Nigeria
NIU	Niue
NFK	Norfolk Island
PRK	North Korea
MNP	Northern Mariana Islands
NOR	Norway
OMN	Oman
PAK	Pakistan
PLW	Palau
PSE	Palestine
PAN	Panama
PNG	Papua New Guinea
PRY	Paraguay
PER	Peru
PHL	Philippines
PCN	Pitcairn Islands
POL	Poland
PRT	Portugal
PRI	Puerto Rico
QAT	Qatar
REU	Reunion
ROM	Romania
RUS	Russia
RWA	Rwanda
BLM	Saint Barth??lemy
SHN	Saint Helena
KNA	Saint Kitts and Nevis
LCA	Saint Lucia

MAF	Saint Martin
SPM	Saint Pierre and Miquelon
VCT	Saint Vincent and the Grenadines
WSM	Samoa
SMR	San Marino
STP	Sao Tome and Principe
SAU	Saudi Arabia
SEN	Senegal
SRB	Serbia
SYC	Seychelles
SLE	Sierra Leone
SGP	Singapore
SVK	Slovakia
SVN	Slovenia
SLB	Solomon Islands
SOM	Somalia
ZAF	South Africa
SGS	South Georgia and South Sandwich Islands
KOR	South Korea
ESP	Spain
LKA	Sri Lanka
SDN	Sudan
SUR	Suriname
SJM	Svalbard and Jan Mayen Islands
SWZ	Swaziland
SWE	Sweden
CHE	Switzerland
SYR	Syria
TWN	Taiwan
TJK	Tajikistan
TZA	Tanzania
THA	Thailand
TGO	Togo
TKL	Tokelau
TON	Tonga
TTO	Trinidad and Tobago
TUN	Tunisia
TUR	Turkey

TKM	Turkmenistan
TCA	Turks and Caicos Islands
TUV	Tuvalu
UGA	Uganda
UKR	Ukraine
ARE	United Arab Emirates
UMI	United States Minor Outlying Islands
VIR	United States Virgin Islands
USA	United States of America
URY	Uruguay
UZB	Uzbekistan
VUT	Vanuatu
VAT	Vatican
VEN	Venezuela
VNM	Vietnam
WLF	Wallis and Futuna Islands
ESH	Western Sahara
YEM	Yemen
ZMB	Zambia
ZWE	Zimbabwe

Note GBR is United Kingdom and can be specified to use your normal UK address management product.