



# Data Express 4.0

## Readme

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# Introduction

General information on the product is available here. This information includes hardware and software requirements, backward compatibility, known errors and restrictions and so on.

If you install a WrapPack containing updates and fixes to your installation, information on the WrapPack is included here. However, last-minute information is only in the WrapPack Readme, which is downloadable with the WrapPack from the product support Web site.

To find out how to get the latest information, see the chapter *Updates and Product Support*.

# What's New

This section describes the new features for the release.

## New Product Shape

Data Express 4.0 introduces a new, non-mainframe solution called Data Express for distributed systems. This solution provides the ability to mask and subset ODBC data stores, using a Windows knowledge base to store metadata, and a redesigned extension architecture to create your test environment.

Our mainframe solution, Data Express for z/OS, has also been updated to allow the masking and subsetting of ODBC data stores. This support is very similar to earlier versions support of the Oracle Extension.

**Note:** The ODBC Extension must be purchased separately to use ODBC data stores with Data Express for z/OS. However, the ODBC Extension is provided automatically with Data Express for distributed systems.

Data Express versions previous to 4.0 are not compatible with the 4.0 Extension Technologies: ODBC Extension and Oracle Extension. Likewise, you cannot use Data Express 4.0 with the Oracle module or SQL Server module used with Data Express 3.5.

## Data Express for Distributed Systems

### Windows Knowledge Base

The Data Express Knowledge Base can now be stored within the Windows environment. Now you can mask and subset ODBC data stores using the Data Express Extension Technology without the need for mainframe interaction at all.

The Windows Knowledge Base, which is preconfigured for use, emulates the mainframe Knowledge Base, serving as a dictionary for all your subsetting and masking metadata. Data Express uses an ODBC driver to access the Knowledge Base on Windows.

### Extension Run-time Knowledge Base

The run-time Knowledge Base for the Data Express extension has been redesigned. This run-time Knowledge Base stores information on the data store being processed, details of steps and elaborations, and details of any filters utilized. The redesign enables more complex subsetting features that were only provided for the z/OS solution in the past; this includes OR classes, combined fields, and user exit modules.

### ODBC Data Stores

Data Express can now work with all ODBC-enabled data sources. In addition, multiple schemas in a single ODBC-enabled data source are supported, as well as multiple ODBC-enabled data stores within a single method.

### Oracle Data Stores

With the Data Express for distributed systems solution, you can handle Oracle data in two different ways:

- You can continue to use the current Oracle Extension option, as you could in Data Express 3.5
- You can use the ODBC option.

The ODBC option does have the following significant advantage: You can subset and mask data across multiple data stores, not just your single Oracle data store.

## Data Express for z/OS

### ODBC Data Stores

Data Express for z/OS can now work with all ODBC-enabled data sources. In addition, multiple schemas in a single ODBC-enabled data source are supported, as well as multiple ODBC-enabled data stores within a single method.

The process of using Data Express for z/OS with an ODBC data store differs from a standard z/OS data store in the following ways:

- Instead of following the mainframe data inventory process outlined in the *Process Guide for z/OS*, the Distributed Loader is used to load information in the z/OS Knowledge Base.
- Data is manipulated and classified in the same manner as outlined in the *Process Guide for z/OS*.
- Data Masking and Data Subsetting are not executed using z/OS jobs. Instead, they are executed by a two step process: first, the Distributed Exporter creates information about your data masking and subsetting criteria, and then the Extension Technology actually masks and subsets your data. Note that this process is almost identical to the way Data Express 3.5 supported the Oracle Extension.

For more information about how Data Express for z/OS is used with a mainframe environment, see:

- Process Guide for z/OS.
- Front End Guide.
- Data Subset Extraction Guide.
- Data MaskingGuide.

### Oracle Data Stores

With the Data Express for z/OS solution, you can handle Oracle data in two different ways: you can continue to use the current Oracle Extension option available in Data Express 3.5, or you can use the ODBC option.

The ODBC option does have the following significant advantage: You can subset and mask data across multiple data stores, not just your single Oracle data store.

## Logging

The new logging process provides the ability to report and exclude from the target environment all records having problems during the `MASKING` process by using an exit routine to store information of record and a new DB2 table to decode every type of error.

Data Express has also been updated to allow the masking and subsetting processes to use the new features and to write the output logging file reporting data of invalid records.



**Note:** There is a prototype of the masking routine using the new way to manage errors and a prototype of the logging routine writing to a sequential file reporting invalid records. All of these are examples and not the code to use.

The logging process must be implemented by a user, modifying the existing customized masking routines, adding the new way to manage errors, and creating a new logging routine for the creation of logging file following the prototypes.

To activate logging:

- Populate the decoding table mapping masking routine return code with the logging routine and expected behavior (whether or not to discard the record).
- Modify the masking routine in order to set the return code in the appropriate way.
- Create the appropriate logging routine.

If the decoding table is empty, no logging will be executed and the masking and subsetting process will be executed as in the previous product versions.

For more information about this new feature, see the chapter *Logging Exit Routine* in the *Data Masking Guide*.

# System Requirements

This section provides system requirements.

## Windows

This section describes the Windows system requirements for using Data Express with Data Express for z/OS and Data Express for distributed systems solutions.

### Hardware Requirements

The following minimum configuration for Windows is required:

Component	Description
Processor	Must be at least the minimum specified for the operating system you are using.
Memory	<ul style="list-style-type: none"><li>• Data Express for z/OS: at least 512 MB is needed; 1 GB is recommended.</li><li>• Data Express for distributed systems: at least 1 GB is needed; 1.5 GB is recommended.</li></ul>
Disk space	<ul style="list-style-type: none"><li>• Data Express for z/OS: at least 30 MB.</li><li>• Data Express for distributed systems: 300 MB of disk space available to install all the modules of the Data Express suite (500 MB recommended).</li></ul>
Video	Display with 800 x 600 SVGA in 256 colors. Preferred screen resolution 1024 x 768 or higher.

### Software Requirements

The following software is supported:

Component	Details	Description
Operating Systems	32-bit Windows	<ul style="list-style-type: none"><li>• Windows 7</li><li>• Windows Vista</li><li>• Windows Server 2008</li><li>• Windows Server 2003 R2, Windows Server 2003</li><li>• Windows XP Professional SP2 or later</li></ul>
	64-bit Windows	<ul style="list-style-type: none"><li>• Windows 7</li><li>• Windows Vista</li><li>• Windows Server 2003 R2</li><li>• Windows Server 2008</li></ul>

Component	Details	Description
		When running on a 64-bit Windows platform, Data Express runs as a 32-bit application.
Third-party software	Data Express for Distributed Systems	Borland Database Engine. This software needs to be installed after the Data Express product installation process on Windows.
	Data Express on z/OS	<p>IBM DB2 Client Application Enabler for Windows version 6.1 or later; or IBM DB2 Connect Personal Edition version 6.1 or later (needed to access Gateway DB2 Connect Enterprise Edition).</p> <p>Borland Database Engine. This software needs to be installed after the Data Express product installation process on Windows.</p> <p>Although not required, if you are using the z/OS solution we recommend that your Windows machine have a direct connection to the DB2 database through DB2 Connect.</p>
Web Browsers		To use Data Express with a web connection, you additionally need: Microsoft IIS version 4 or higher; or Netscape Enterprise version 3.6 or higher.

### User Authorization Requirements

For Data Express for z/OS, when a project is opened for the first time, the user ID and password for the connection to the database server where the work environment resides must be provided. The user ID provided must have read privileges on the following:

`SYSIBM.SYSTABLES`

all tables created by Data Express during product installation

## z/OS

This section describes requirements for the System z servers running z/OS. If you are using Data Express for distributed systems, which means that your Knowledge Base will reside on a Windows machine, you can skip this section.

### Hardware Requirements

Any mainframe system that supports the minimum software requirements listed in the Software Requirements section can be used. Data Express requires the following amount of disk space:

- 183 MB disk space available for product installation
- 3 MB of disk space per analyzed archive (50 fields)

### Software Requirements

The following software is supported for z/OS:

- MVS, OS/390 2.5 or later, or z/OS 1.1 or later
- Language Environment 6.1 or later
- IBM DB2 (z/OS version, or OS/390 version 7 or later)

### DB2 Database Requirements

Data Express for z/OS uses a DB2 database that contains about 150 tables and views. The database must be at least DB2 V7R1 with proper DDF configuration.

The tablespace definition for one table and the DDL statements used to create the database and are shown below.

```
CREATE TABLESPACE          ANURDCLA
      IN                    &URDBASE
      USING STOGROUP        &URSGROUP
      PRIQTY                 $PQTY
      SECQTY                 $SQTY
      FREEPAGE              $FPAGE
      PCTFREE               $PFREE
      BUFFERPOOL            &URBPTS
      SEGSIZE 64
      COMPRESS              $COMPRESS;

CREATE TABLE &UOWNER..ANURDCLA
(MCRECID                SMALLINT                NOT NULL WITH DEFAULT,
 FILRECID                INTEGER                NOT NULL WITH DEFAULT,
 FLDRECID                INTEGER                NOT NULL WITH DEFAULT,
 CLATYPE                SMALLINT                NOT NULL WITH DEFAULT,
 PRG                      SMALLINT                NOT NULL WITH DEFAULT,
 CDRULECLA              INTEGER                NOT NULL WITH DEFAULT,
 CONFID                  INTEGER                NOT NULL WITH DEFAULT,
 FLAGDEL                 CHAR          (001)    NOT NULL WITH DEFAULT,
 BESTCLA                 CHAR          (001)    NOT NULL WITH DEFAULT)
IN &URDBASE..ANURDCLA;
```

### Data Set Requirements

Data Express for z/OS uses 45 partitioned data sets (PDS) and 4 sequential data sets (SEQ). PDS and SEQ data sets are identified by the combination of a prefix and a suffix. However, the user can only choose the prefix.

The current prefixes are **MFDATA.VxRx** for the VR release library, **MFDATA.VxRxPTF** for the PTF library, and **MFDATA.VxRxPER** for the Personalized library. These prefixes can be modified. Suffixes (for example, BIND, CLIST, and DDL) cannot be modified.

Data Express for z/OS uses the following 45 partitioned data sets:

```
MFDATA.V3R5.BIND
MFDATA.V3R5.CBL
MFDATA.V3R5.CLIST
MFDATA.V3R5.COPY
MFDATA.V3R5.DBRMLIB
MFDATA.V3R5.DDL
MFDATA.V3R5.DDLALTER
MFDATA.V3R5.FTOUTPUT
MFDATA.V3R5.JCL
MFDATA.V3R5.LOAD
MFDATA.V3R5.OBJ
MFDATA.V3R5.PACKAGE
MFDATA.V3R5.PANEL
MFDATA.V3R5.SKEL
MFDATA.V3R5.SYSPUNCH
```

```
MFDATA.V3R5PTF.BIND
MFDATA.V3R5PTF.CBL
MFDATA.V3R5PTF.CLIST
MFDATA.V3R5PTF.COPY
MFDATA.V3R5PTF.DBRMLIB
MFDATA.V3R5PTF.DDL
MFDATA.V3R5PTF.DDLALTER
MFDATA.V3R5PTF.FTOUTPUT
MFDATA.V3R5PTF.JCL
MFDATA.V3R5PTF.LOAD
MFDATA.V3R5PTF.OBJ
MFDATA.V3R5PTF.PACKAGE
MFDATA.V3R5PTF.PANEL
MFDATA.V3R5PTF.SKEL
MFDATA.V3R5PTF.SYSPUNCH
MFDATA.V3R5PER.BIND
MFDATA.V3R5PER.CBL
MFDATA.V3R5PER.CLIST
MFDATA.V3R5PER.COPY
MFDATA.V3R5PER.DBRMLIB
MFDATA.V3R5PER.DDL
MFDATA.V3R5PER.DDLALTER
MFDATA.V3R5PER.FTOUTPUT
MFDATA.V3R5PER.JCL
MFDATA.V3R5PER.LOAD
MFDATA.V3R5PER.OBJ
MFDATA.V3R5PER.PACKAGE
MFDATA.V3R5PER.PANEL
MFDATA.V3R5PER.SKEL
MFDATA.V3R5PER.SYSPUNCH
```

Data Express uses the following four sequential data sets:

```
MFDATA.V3R5.IMP SRC
MFDATA.KBPARAM
MFDATA.V3R5.ALLDDL
MFDATA.V3R5.ALLBNDPK
```

The installer can modify the names of the first and second qualifier of a data set (for example: **MFDATA.V3R5**, **MFDATA.V3R5PTF**, and **MFDATA.V3R5PER**) according to your requirements.



**Note:** The total space occupied by all data sets does not exceed 50 MB.

### User Credential Requirements

Data Express for z/OS users must be suitably configured both at the TSO and DB2 level. For a proper configuration, the following authorizations are required:

- RACF authorizations (create, update, and delete) to the product PDS and sequential files (for example, JCL, CLIST, and SKEL).
- Authorizations to the creation of the product DB2 database (storage group and database).
- Authorizations to the creation of the DB2 tablespaces, views, and indexes.
- Authorizations to the execution of package and plan binds.

### Site-specific Requirements

Most activities in Data Express for z/OS consist of batch jobs executed through JCLs, which are normally created by specific submission functions by updating predefined skeletons (parameters, environment, and database specifications).



**Note:** If necessary, you can create permanent copies of the updated JCLs and adjust them to your organizational requirements.

The following actions may be performed in order to customize the product to meet organizational standards:

- Modify job names (function supported during product installation).
  - Customize the skeletons.
  - Start work with proprietary or third-party products for scheduling or controlling jobs.
  - Make adjustments as required to provide interfaces with scheduling products
- ```
CREATE STOGROUP &URSGROUP VOLUMES (xxxxxxxxxx) VCAT xxx;
CREATE DATABASE &URDBASE STOGROUP &URSGROUP;
```
- Modify names such as the DB2 storage group group (STOGROUP), database, and owner (function supported during product installation)
  - Modify names of tablespaces, tables, views, and indexes (function not supported during product installation) *Define ALIAS or SYNONYM*
  - During the installation phase at your site, the installer will need to know your standards for:
    - Jobs names, accounting, etc.
    - Names of each DB2 subsystem, name of the DB2 load library, name and plan of DSNTIAD, name and plan of DSNTIAUL.
    - Name of the volume on which to allocate your partitioned data sets.

## Extension Technology

This section describes requirements needed for the Extension Technology: ODBC Extension or Oracle Extension.

### Hardware Requirements

| Component  | Description                                                                                                                                                                                                                                                    |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor  | Must be at least the minimum specified for the operating system you are using.                                                                                                                                                                                 |
| Disk space | <ul style="list-style-type: none"> <li>• Optional ODBC Extension: less than 5 MB per platform, precise details provided during install.</li> <li>• Optional Oracle Extension: less than 5 MB per platform, precise details provided during install.</li> </ul> |

### Software Requirements

| Component      | Description                                                                                                                                                                                             |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 32-bit Windows | <ul style="list-style-type: none"> <li>• Windows Vista</li> <li>• Windows Server 2008</li> <li>• Windows Server 2003 R2, Windows Server 2003</li> <li>• Windows XP Professional SP2 or later</li> </ul> |

| Component      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 64-bit Windows | <ul style="list-style-type: none"> <li>Windows Vista</li> <li>Windows Server 2003 R2</li> <li>Windows Server 2008</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| UNIX           | <ul style="list-style-type: none"> <li>IBM System p running AIX 5.3 or 6.1</li> <li>IBM System z running SuSE Linux Enterprise Server 10 SP1</li> <li>Itanium running HP/UX 11iv2 or 11iv3</li> <li>PA-RISC running HP/UX 11.11, 11iv2 or 11iv3</li> <li>x86 running Red Hat Linux 4.0 Update 1, 5.1 or 5.3</li> <li>x86 running SuSE Linux Enterprise Server 10 SP1</li> <li>SPARC running Solaris 9 or 10</li> </ul> <p> <b>Note:</b> When running on 64-bit UNIX platforms, Data Express Extension works as a 32-bit application.</p> |

### Run-time Knowledge Base Requirements

This section describes requirements that apply to both Windows and UNIX platforms.

Before using either the ODBC or Oracle Extension, a Run-time Knowledge Base needs to be created within your source data store(s). The Run-time Knowledge Base drives the operation and performance of the Data Express masking and subsetting processes.

The Run-time Knowledge Base consists of tables and indexes, and needs to be created using the schema name **DEKB**.

 **Note:** As different data stores have different requirements for creating schemas and associated objects, Micro Focus strongly suggests that the database administrator (DBA) for each source data store create the associated Data Express Run-time Knowledge Base.

A script, `createkb.sql` is provided within the `config` directory. This script contains canonical DDL (Data Definition Language) statements, describing the Run-time Knowledge Base tables and indexes.

Please note that `createkb.sql` is not guaranteed to execute correctly for all source data stores as-is. Each data store can have slightly different syntax when it comes to `CREATE TABLE` and `CREATE INDEX` statements. The DBA for your source data store can assess what changes are necessary to allow the successful creation of the `DEKB` schema, and will have the appropriate permissions to create and populate that schema.

If you are the DBA for a source data store, please review the Customer Care Knowledge Base article #10277 for additional details on how to create the Run-time Knowledge Base for your source data store.

### User Credential Requirements

This section describes requirements that apply to both Windows and UNIX platforms.

ODBC or Oracle Extension users are required to have the appropriate access to source and target data stores, as well as to the Run-time Knowledge Base, which is located in the source data store(s).

The table below lists the pertinent objects and specific privileges required to mask and subset data:

| Object                  | Privilege Required                                                                                 |
|-------------------------|----------------------------------------------------------------------------------------------------|
| Source data store(s)    | SELECT on tables to be processed within the specified schema(s).                                   |
| Run-time Knowledge Base | INSERT, SELECT, and DELETE on the tables within the DEKB schema.                                   |
| Target data store(s)    | CREATE TABLE, INSERT, UPDATE, and DELETE on tables to be processed within the specified schema(s). |



**Note:** As different data stores have different user credential requirements, Micro Focus strongly suggests that the DBA for the data stores listed above establish appropriate user credentials.

For security reasons, it may not be permissible to allow Data Express privileges to operate in the manner described in the table above. In this case, you can use Extension Technology in *unload* mode.

For more information regarding unload mode, see the chapter *Extension Technology Utilities* in the *Getting Started with Distributed Data Stores* guide.

### ODBC Extension Requirements

To use the ODBC Extension with an ODBC-enabled data store, you will need:

- ODBC driver relevant to your data store
- The UNIX machine should be configured with the environment variable settings needed to provide connectivity to the ODBC data store. At minimum, this should include:
  - ODBCINI - this should be set to the ODBC configuration file `LD_LIBRARY_PATH` (Linux, Solaris), `SHLIB_PATH` (HP/UX), or `LIBPATH` (AIX) , for the ODBC Driver Manager.
  - Any additional environment variables as specified within the documentation of your ODBC Driver Manager and ODBC Driver software.

### Oracle Extension Requirements

To use the Oracle Extension, the machine housing the Data Express installation requires, at minimum, an Oracle client installation, including the Oracle Call Interface (OCI) support, configured to connect to the Oracle data store.

Data Express supports the following Oracle versions:

- 9i
- 10g
- 10g r2
- 11g

The UNIX machine should be configured with the environment variable settings needed to connect to the Oracle database, for example:

```
ORACLE_HOME
ORACLE_SID
PATH
LD_LIBRARY_PATH (Linux, Solaris) SHLIB_PATH (HP/UX) or LIBPATH (AIX)
```

# Installation Notes

The notes below give information on installing Data Express.

After installing, you need to install the latest updates, from the Micro Focus product support Web site <http://supportline.microfocus.com>.

For installation instructions, refer to the following chapters of the *Installation Guide*, as appropriate:

- z/OS - z/OS System Procedures.
- Windows - Section Windows Installation of chapter Distributed Systems Procedures.
- UNIX - Section UNIX/Linux Installation of chapter Distributed Systems Procedures.

## Windows Installation Program

To install the product, you need to be logged in with a user-ID that has Administrator privileges on the local machine, so the installation software can set the environment appropriately.

The installation program should start automatically when you insert the CD. If after a few seconds the installation window hasn't appeared, run the installation program as follows: `x :\setup.exe`

where x is your CD drive.

If you do not install an option or a sub-option, you can add it later by using **Control Panel > Add or Remove Programs** and selecting Micro Focus Data Express 4.0 and clicking **Change**.

## Offline Web Browser

To use your Web browser off line, you need the dial-up networking feature Windows XP installed. Otherwise you may have TCP/IP errors such as being unable find "localhost" or the numeric equivalent (127.0.0.1).

## Uninstalling

To uninstall the product, you need to be logged in with the same user-ID as you used when you installed it.

To uninstall the product, you cannot simply delete its files from your hard disk. Instead, you uninstall by using **Control Panel > Add or Remove Programs**, on most Windows systems. You might need to ensure that **Show Updates** (at the top of the **Add or Remove Programs** dialog) is checked, so that any hot fixes or WrapPacks are listed.

When you uninstall, the only files deleted are those that the installation software installed. If your Data Express directory has not been removed, delete any unwanted files and subdirectories within it using **Windows Explorer**.

## Repairing

If any product files, registry settings or shortcuts are accidentally removed at any point, you can perform a Repair on the installation to replace them. To do this, use **Control Panel > Add or Remove Programs** and follow the instructions on the screen.

# Updates and Product Support

After you have installed Data Express, you need to apply the latest updates if there are any. These are located on the Micro Focus web site in the Support section.

Before you can access the updates, you need to register with Product Support, as follows:

1. Go to the main product support page by entering `http://supportline.microfocus.com` in your browser.
2. Click **Register** on the product support page.
3. Enter your details. You will need your product serial numbers, which you can find on the colored card in the CD case or on a sticker on the box.

To access the updates:

1. Either enter `http://supportline.microfocus.com` in your browser, or start your Micro Focus product and click **Help > Micro Focus SupportLine**.
2. Log in.
3. Click **Product Updates** in the left-hand menu column, and select the appropriate link.
4. Apply the latest updates for your product and version number.

SupportLine is a Web-based support and information service from Micro Focus. It provides all the latest information and software updates for your development system:

- Technical support information
- Latest product information
- Documentation updates
- New and updated demonstrations and templates
- Hints and tips
- Lots more - try it and see!

# Known Issues and Restrictions

The restrictions covered here are those that are not covered elsewhere in the documentation, or that are of a temporary nature and may be removed in a later product. Other restrictions are covered in the chapter *Supplementary Information for Data Express*:

- Data Express supports LOB field types for DB2 with some restrictions. See the chapter DB2 for z/OS environment restrictions.
- Data Express supports XML field types for DB2 with some restrictions. See the chapter DB2 for z/OS environment restrictions.
- Data Express supports VARBINARY fields types for DB2 with some restrictions. See the chapter DB2 for z/OS environment restrictions.
- Data Express does not support LOB field types for ADABAS databases. Also, some Binary field types are not handled during ADABAS FDT analysis.
- For DB2 tables with non-direct access, Life Cycle requires SYSPUNCH and DCLGEN to be partitioned data set (PDS) members, even though the cataloging phase supports SYSPUNCH and DCLGEN as sequential files. If you want to use Life Cycle and you have cataloged SYSPUNCH in a sequential file, you will need to delete it from the knowledge base and re-catalog it as a PDS member.
- For ODBC and Oracle data stores, only limited Life Cycle processing using Distributed Loader is supported. The options skip, overwrite, and update are supported.
- The Extension Technology does not support use of the parallel execution mode where multiple methods access the same tables within the target data store(s).
- Data Express does not support sampling on true binary data.
- Currently Data Express only shows the first 1000 distinct values and ranges, which are sorted either numerically or alphanumerically based on the data element type. When there are more than 1000 distinct data element values, the Data Element Value ends at the 1000<sup>th</sup> unique value instead of the greatest data element value.

# Supplementary Information

The following sections contain supplementary information about this release.

## Supported Character Encoding Systems

The following 1-byte character encoding systems are supported:

| Character Encoding System         | Windows CP | Mainframe CP     | UNIX CS            |
|-----------------------------------|------------|------------------|--------------------|
| ISO8859-1 Latin1 (Western Europe) | 1252       | *see table below | ISO8859-1(15)      |
| ISO8859-2 Latin2 (Eastern Europe) | 1250       | IBM-870          | ISO8859-2          |
| ISO8859-5 Cyrillic                | 1251       | IBM-1025         | ISO8859-5* (iconv) |
| ISO8859-7 Greek                   | 1253       | IBM-875          | ISO8859-7          |
| ISO8859-9 Turkish                 | 1254       | IBM-1026         | ISO8859-9          |
| ISO8859-8 Hebrew                  | 1255       | IBM-424          | ISO8859-8          |
| ISO8859-6 Arabic                  | 1256       | IBM-420          | ISO8859-6* (iconv) |

The following mainframe character encoding systems are compatible with ISO8859-1:

| Encoding System | Location                                                           |
|-----------------|--------------------------------------------------------------------|
| IBM-037(1140) - | USA, Canada, Australia, New Zealand, Netherlands, Brazil, Portugal |
| IBM-273(1141) - | Austria, Germany                                                   |
| IBM-274 -       | Belgium                                                            |
| IBM-275 -       | Brazil                                                             |
| IBM-277(1142) - | Denmark, Norway                                                    |
| IBM-278(1143) - | Finland, Sweden                                                    |
| IBM-280(1144) - | Italy                                                              |
| IBM-281 -       | Japanese English                                                   |
| IBM-284(1145) - | Spanish                                                            |
| IBM-285(1146) - | United Kingdom                                                     |
| IBM-297(1147) - | France                                                             |
| IBM-500(1047) - | Latin-1                                                            |
| IBM-871(1149) - | Iceland                                                            |

Data Express does not support any additional character encoding systems at this time. This includes any multi or mixed byte character sets for CJK languages, Vietnamese, or any of the various forms of UNICODE, including UTF-8, UTF-16, and UCS-2.

## Supported Data Types

### ODBC Extension

The ODBC extension works with the following data types:

- SQL\_SS\_XML
- SQL\_GUID
- SQL\_BIT
- SQL\_TINYINT
- SQL\_BIGINT
- SQL\_LONGVARBINARY
- SQL\_VARBINARY
- SQL\_BINARY
- SQL\_LONGVARCHAR
- SQL\_CHAR
- SQL\_NUMERIC
- SQL\_DECIMAL
- SQL\_INTEGER
- SQL\_SMALLINT
- SQL\_FLOAT
- SQL\_REAL
- SQL\_DOUBLE
- SQL\_DATE
- SQL\_TIME
- SQL\_TIMESTAMP
- SQL\_VARCHAR
- SQL\_TYPE\_DATE
- SQL\_TYPE\_TIME
- SQL\_TYPE\_TIMESTAMP

### Oracle Extension

The Oracle Extension works with the following Oracle Built-in data types:

- VARCHAR2
- NUMBER
- FLOAT
- LONG
- DATE
- TIMESTAMP
- INTERVAL YEAR TO MONTH
- INTERVAL DAY TO SECOND
- RAW
- LONG RAW

- CHAR
- CLOB
- BLOB
- BFILE
- 

The Oracle Extension also works with the following Oracle-supplied type: XMLType.

### **DB2 for z/OS Environment Data Type**

Data Express for z/OS works with the following DB2 data types:

- CHAR
- VARCHAR
- GRAPHIC (Processed as char)
- VARGRAPHIC (Processed as Varchar)
- TIME
- TIMESTAMP
- DATE
- SMALL INTEGER
- INTEGER
- BIGINT
- DECIMAL
- NUMERIC
- REAL FLOAT (Supported only for Loading process)
- DOUBLE FLOAT (Supported only for Loading process)
- DOUBLE PRECISION FLOAT (Supported only for Loading process)
- DECFLOAT (Supported only for Loading process)
- ROWID
- LONGVARCHAR
- LONGVARGRAPHIC
- BINARY
- VARBINARY

z/OS also works with the following Large Object data type:

- CLOB
- DBCLOB
- BLOB
- XML

### **COBOL & PL/I for z/OS Environment Data Type**

Data Express for z/OS works with the following Cobol & PL/I data types:

- CHAR PIC X(n)
- BINARY PIC 9(n) COMP-4
- PACKED PIC S9(p-s)V9(s) COMP-3
- ZONED PIC S9(p-s)V9(s)
- EDITED Use of edit char, e.g. PIC ZZ99

## ADABAS for z/OS Environment Data Type

Data Express for z/OS works with the following ADABAS data types:

- ALPHANUMERIC
- BINARY
- FLOATING POINT
- PACKED DECIMAL
- UNPACKED DECIMAL(ZONED)

## Data Type Restrictions

This section lists size and format restrictions for data types.

### Size Restrictions

The ODBC Extension has a size restriction of 1,048,576 bytes when processing the following data types:

- IMAGE
- TEXT
- VARBINARY
- VARBINARY(MAX)
- VARCHAR(MAX)
- XML

### Format Restrictions

The ODBC Extension has a format restriction for field content that use the `DATETIME` or `SMALLDATETIME` data type for Data Subset Extraction: Data Subset Extraction rules must be specified using the format as documented by Microsoft.

## ADABAS Restrictions

This section describes size restrictions for ADABAS data stores.

### ADABAS Catalog Link

Data Express does not support a direct link to the ADABAS catalog . In order to mask or subset your data, you must first use the **ADABAS FDT** report to produce the output sequential file containing the structure definition of your ADABAS tables. Then, you must upload the decompressed files (that were created by the command `ADACMP DECOMPRESS`) that contain the content of your ADABAS tables.

For information about the ADABAS FDT report, see the chapter *Load Sequential File with ADABAS FDT report* in your *Toolkit (z/OS) guide*.

For information about the structure of the output sequential file, see the section *ADABAS - API Load Sequential File* in the chapter *Sequential Files* in the *Data Model Guide*.

### Descriptors, Subdescriptors, and Superdescriptors

Descriptors are handled as normal fields, but subdescriptors cannot be handled. In order to mask or subset a subdescriptor, an exit routine that is associated to the field referenced by the subdescriptor is needed.

The superdescriptor clause in the FTD is not directly supported by Data Express. However, a superdescriptor can be handled if a combined data element is created in Data Builder that is composed of each field within that superdescriptor.

### Target Environment Creation and Population Limitation

Sequential data sets that contain the output of the masking or subsetting process for ADABAS data stores are created by Data Express in the same way sequential data sets are created for other data store types. But, to populate your target environment, ADABAS utilities must be used as Data Express does not provide functionality that enables creation or population of your target environment.

### Process Identifier Limitation

Data Express needs a specific Process Identifier in order to work properly with ADABAS data store.

We recommend using a pre-loaded Process Id ADAUN.

For information about the structure of the ADAUN Process Identifier, see the section *Process Identifier and Databases Type Relationships* in the chapter *Getting Started with Data Builder* in the *Front End Guide*.

## DB2 for z/OS Environment Restrictions

This section lists size restrictions for DB2 for z/OS Large Object data types like CLOB, DBCLOB, BLOB, XML, and for DB2 z/OS VARBINARY data types.

### DB2 Large Object Data Types restrictions

Data Express does not support a direct link to all the DB2 Large Object data types for these three operations:

- Masking
- Subsetting
- Sampling

In order to mask or subset or sample your data, you must first use file reference variables method to unload each LOB or XML to a separate file. With this method, the LOB or XML values are unloaded to a different file than the normal unload file. DB2 creates or uses a different output file for each LOB or XML value to be unloaded. The output file should be on the following type:

Member of a partitioned data set (PDS) or partitioned data set extended (PDSE). See the following example JCL :

```
//LOADLOB JOB KRM,MSGCLASS=A,CLASS=1,NOTIFY=&SYSUID
//* *****
//* TABLE &OWNNAME.&TABNAME
//* (PDFBLO BLOB (27994))
//* (TXTCLO CLOB (16094) )
//* (PDFBLO BLOB (16032) )
//* UNIT(SYSDA) SPACE ((20,2) MB)
//* (PDFBLO VARCHAR(54) BLOBF TSYSLOB)
//* *****
//STEP1 EXEC DSNUPROC,UTPROC=,SYSTEM=&SYSTEM,LIB=DSN810.SDSNLOAD
//SYSPRINT DD SYSOUT=*
//SYSIN DD *
    TEMPLATE TSYSPUN
        DSN('URADAR.&SS..&DB..PUNCH.&TABNAME')
        DISP(MOD,CATLG,CATLG)
    TEMPLATE TSYSLIB
```

```

        DSN( 'URADAR.&SS..&DB..SYSREC.&TABNAME' )
        DISP(MOD,CATLG,CATLG)
    TEMPLATE TSYSL0B
        DSN( 'URADAR.&SS..&DB..PDS.&TABNAME' )
        DISP(MOD,CATLG,CATLG)
        DSNTYPE(PDS)
    UNLOAD DATA FROM TABLE &OWNNAME.&TABNAME
        (A, B,C VARCHAR(44) CLOBF TSYSL0B, D)
    UNLDDN(TSYSREC) PUNCHDDN(TSYSPUN)
/*
//

```

Data Express supports a direct link to all the Large Object data types for this operation:

- Cataloguing
- Life Cycle
- Reload
- Unload

For the Data Express skeleton of Unload and/or Reload's Job, there are some modifications to apply:

- Add the "TEMPLATE" condition.
- If needed, add the field list with the specific keyword &FLDLST to be substituted.

The following example shows the Data Express Unload skeleton with the modifications applied:

```

//SYSIN      DD *
    TEMPLATE TSYSL0B
        DSN( 'URADAR.&DBNAME.&TSNAME.PIPPO' )
        DISP(MOD,CATLG,CATLG)
        DSNTYPE(PDS)
    UNLOAD FROM TABLE
        &OWNNAME.&FILENAME  HEADER NONE      LIMIT 0
&FLDLST
&DBNAME.&TSNAME

```

### Process Identifier Limitation

Data Express needs a specific Process Identifier in order to works properly with DB2 Large Object data type.

Since Data Express doesn't have a pre-loaded Process Id for this kind of data, we recommend creating a new Process Identifier following these specific properties:

- Access Type: Unload File Access (UNLOAD)
- I/O Program Name: KURFIO.

For information about the Process Identifier structure, see the section *Process Identifier and Databases Type Relationships* in the chapter *Getting Started with Data Builder* in the *Front End Guide*.

### DB2 VARBINARY Data Types restrictions

When Data Express accesses DB2 by direct access, it does not work directly with the execution of sub-extraction query created when applying a method's filter criteria if the filter is applied to a VARBINARY column or to a combined field containing VARBINARY column.

In general, when Data Express accesses DB2 by direct access, it creates a **SELECT \*** statement with a **WHERE** clause in order to apply the appropriate filters.

For VARBINARY data type, Data Express will not generate this **WHERE** condition, but just the **SELECT \*** statement.

The access to data in this case is done by a sequential access and the application of filter's criteria is done by Data Express in a transparent way, applying the filter criteria to each record and discarding this record not satisfying the filter.

For information about the Filter properties, see the chapter *Work with Method - Selection Class/Filter properties* in the *Data Subset Extraction Guide*.

# Readme Help

The `Readme Help` is a file containing extensive advice on possible problems and troubleshooting. The on-screen installation instructions include an opportunity for you to look at it. If you want, you can see the `Readme Help` even before starting to install Data Express.

# Contact Information

If ever you have any problems or you would like additional technical information or advice, there are several resources.

## Help with Problems

In some countries, product support from Micro Focus may be available only to customers who have maintenance agreements.

If you obtained this product directly from Micro Focus, contact us as described below. If you obtained it from another source, such as an authorized distributor, contact them for help first. If they are unable to help, contact us as described below.

Before you ask for help, try and find answers in the `Product Information` folder of the Help or in the main body of the Help.

## Information We Need

However you contact us, please try to include the information below, if you have it. The more information you can give, the better product support can help you. But if you don't know all the answers, or you think some are irrelevant to your problem, please give whatever information you have.

- The version of the product that you are using. You can locate the version number:
  - Windows: from the **Help > About**.
  - z/OS: from the **Main Menu** panel.
  - ODBC/Oracle Extension: from the banner displayed when executing the Extension.
- Your operating system and version number.
- The data stores you are working with, including client-side and server-side versions where appropriate. If using ODBC data stores, also include details of the vendor and version of the ODBC driver(s) being used, as well as the equivalent information about the RDBMS.
- If using Data Express for z/OS, indicate whether you are using the Standard or Client/Server configuration.
- An explanation of what you are trying to do and step-by-step instructions needed for reproducing the issue, including any error messages received.
- Diagnostic information:
  - z/OS: Screenshots, log files, JCL scripts, output, and dumps
  - ODBC Extension/Oracle Extension: Contents of the `config` and `log` directories. We may request that you change the setting of the `LogLevel` parameter with the `dxeconfig.cfg` file to provide additional diagnostic information. See the chapter *Using Extension Technology* of the *Getting Started with Distributed Data Stores* for further details on the `LogLevel` parameter.
- Details of the data store contents, for example:

```
DDL, DCLGEN, or SYSPUNCH (for SQL data stores)
Copybooks (SEQ, VSAM, GDG, DL/I)
FDT (ADABAS)
DBD (DL/I)
```
- Your Software Support Identification Number (SSIN) if you have one (not used in all countries).

## **Contact Information**

Our Web site gives up-to-date details of contact numbers and addresses. The product support pages contain considerable additional information, including the WebSync service, where you can download fixes and documentation updates. To connect, enter <http://www.microfocus.com> in your browser to go to the Micro Focus home page.

If you are a Micro Focus product support customer, please see your product support Handbook for contact information. You can download it from our web site or order it in printed form from your sales representative.

Support from Micro Focus may be available only to customers who have maintenance agreements.