

SYSDDM Utility

The utility SYSDDM is used to create and maintain Natural data definition modules (DDMs).

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DDMs

For general information on DDMs, refer to the Natural Programming Guide.

A Natural application can only access a database file if a corresponding DDM has been created and cataloged for the file.

Cataloged DDMs are stored in the Natural system file FDIC.

A DDM can be created either with the SYSDDM utility (as described in this section) or with Predict (as described in the Predict documentation).

SYSDDM and Predict

If Predict is installed at your site, you should **not** use SYSDDM; instead, it is recommended that you use the functions offered by Predict for the creation and maintenance of DDMs.

With Predict, it is possible to control the availability of SYSDDM. It may therefore be that the use of SYSDDM has been restricted and certain SYSDDM functions are not available to you. Please see the Predict documentation for further information.

Invoking SYSDDM

▶ To invoke the SYSDDM utility

- Enter the SYSDDM system command.
The main menu of SYSDDM is displayed:

```

09:18:45          ***** NATURAL SYSDDM UTILITY *****          1999-12-02
User SAG          - Menu -          FDIC (10,160)
          Code  Function          Work area empty

          G    Generate DDM from ADABAS FDT
          C    Catalog DDM
          E    Edit DDM
          U    Delete DDM
          L    List DDMs
          X    List DDMs with Additional Information
          M    Copy DDM to Another FDIC File
          S    Show Defined DBIDs and Used FNRs
          B    SQL Services
          D    DL/I Services
          .    Exit

Code ..... _          FDIC Type ..... A
DDM Name .. _____          DDM Type ..... _
FNR ..... 0          DBID .. 0          ADABAS Password ..
Replace ... N          DBID Type ..... 6

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
          Help          Exit          Canc
    
```

Overview of Functions

From the SYSDDM main menu you can select the following functions:

Function	Explanation
Generate DDM from Adabas FDT	Generates a DDM from an Adabas field description table (FDT) and places it in the SYSDDM work area for further processing.
Catalog DDM	The DDM currently in the SYSDDM work area is cataloged, making it available for use within Natural applications. The DDM must have been placed in the work area by the function Generate DDM from Adabas FDT, or have been entered by using the function Edit DDM. For a VSAM DDM (DDM Type = V), SYSDDM prompts you for additional information; for details, see the Natural for VSAM documentation, Natural File Access.
Edit DDM	Reads a DDM from the system file FDIC and into the SYSDDM work area, where it can be edited.
Delete DDM	Deletes a cataloged DDM from the system file FDIC.
Copy DDM	Copies a DDM from one FDIC system file to another.
List DDMs	Displays a list of the DDMs stored in the specified FDIC system file. From the list, you can select individual DDMs for further processing. This function corresponds to the system command LIST DDM (see LIST in the Natural Command Reference documentation).
List DDMs with Additional Information	Displays a list of the DDMs stored in the specified FDIC system file. From the list, you can select individual DDMs for further processing. This function differs from the List DDMs function in that it displays additional items of information on the individual DDMs.
Show Defined DBIDs and Used FNRs	This function shows you which DBIDs are defined, as well as all file numbers of a given DBID for which DDMs have been defined.
SQL Services	This function is available only if Natural for DB2 or Natural for SQL/DS is installed. It is used to generate DDMs from DB2 or SQL/DS tables and is described in the documentation Natural for DB2 and Natural for SQL/DS respectively.
DL/I Services	This function is available only if Natural for DL/I is installed. It is used to maintain the Natural for DL/I environment. Functions are provided for inquiry into and modification of structures, such as DL/I Database Descriptions (DBDs), Program Specification Blocks (PSBs), Program Communication Blocks (PCBs), DDMs and segment layouts. This function is described in the documentation Natural for DL/I.

The following parameters can be specified on the SYSDDM main menu for the various functions:

Parameter	Explanation
DDM Name	The name of the DDM to be processed. To process multiple DDMs, you can use asterisk notation for the name.
FNR	The file number of the database file for which the DDM is (to be) defined.
DBID	The database which contains the file for which the DDM is (to be) defined.
Replace	Y A DDM which is being copied or cataloged will replace an existing DDM of the same name. N Existing DDMs are not replaced.
FDIC Type (display only)	The database type of the system file. Possible types are the same as for DDM Type (see below).
DDM Type	The type of DDM. Possible types are: A Adabas V VSAM 2 DB2 D DL/I P Entire System Server S SAP C Command processor
Adabas Password	The password required by Adabas if Adabas Security is installed.
DBID Type (display only)	The database type of the database specified in the DBID field. Possible types are the same as for DDM Type (see above); exception: for an Adabas database, the Adabas version (5 or 6) is displayed.

Generate DDM from Adabas FDT

This function is used to generate a DDM from an existing Adabas Field Description Table (FDT).

You have to enter the file number (FNR) of the Adabas file.

You can also enter a DBID. If you do not enter one, the DBID currently in effect for the session is used.

The generated DDM is placed in the SYSDDM work area for further processing.

Catalog DDM

To catalog a DDM, you either select the function Catalog DDM on the SYSDDM main menu or enter the command CATALOG in the command line of the DDM editor.

For this function, you have to specify the DDM name and file number (FNR).

The DBID, if not entered, is generated dynamically at execution time based on the DBID of the Natural user system file(FUSER) in use (see also the UDB profile parameter in the Natural Parameter Reference documentation).

For additional options for VSAM files, see the documentation Natural for VSAM.

Edit DDM

When you modify a DDM, all programming objects which reference this DDM must be cataloged again.

This function reads a DDM from the system file FDIC and places it into the SYSDDM work area, where you can edit it.

If you invoke this function without specifying a DDM, and there is no DDM already in the work area, an empty work area is displayed, allowing you to manually enter a DDM definition.

Instead of entering a complete DDM manually, you can read an existing DDM into the work area, modify it, and catalog it under a different name.

Below is information on:

- DDM Editor
- Field Attributes
- DDM Editor Commands
- Extended Field Editing

DDM Editor

```

09:26:50          ***** EDIT DDM (ADA) *****          1999-12-02
DDM Name EMPLOYEES          Def.Seq.          DBID          0 FNR          316
Command
I T L DB Name          F Leng  S D Remark
----- top -----
  1 AA PERSONNEL-ID          A 8.0          D
*          CNNNNNNN
*          C=COUNTRY
G 1 AB FULL-NAME
  2 AC FIRST-NAME          A 20.0  N
  2 AD MIDDLE-I          A 1.0    N
  2 AE NAME          A 20.0          D
  1 AD MIDDLE-NAME          A 20.0  N
  1 AF MAR-STAT          A 1.0    F
*          M=MARRIED
*          S=SINGLE
*          D=DIVORCED
*          W=WIDOWED
  1 AG SEX          A 1.0    F
  1 AH BIRTH          D 6.0          D
  1 AH N)BIRTH          I 2.0          D
G 1 A1 FULL-ADDRESS

SYSDDM 4393: DDM read into the source area.
    
```

If you enter the command HELP (or a question mark) in the command line, the editor help information is displayed.

The header of the DDM editor contains the following information:

DDM Name	The name used to reference the DDM in a Natural program. The name must be unique within the specified Natural system file.
Def. Seq.	The default sequence by which the file is read when it is accessed with a READ LOGICAL statement in a Natural program.
DBID	The database in which the file to be accessed with the DDM is contained. If 0 (zero) is specified, the default DBID for the Natural user system file (FUSER) as defined in the Natural parameter module is used.
FNR	The number of the file being referenced. If an Adabas file is used, the Adabas file number must be entered. If a DL/I segment type is used, the file number specified is used internally by Natural for DL/I. For VSAM files, see the Natural for VSAM documentation.

Field Attributes

The DDM itself comprises the following field definition attributes which can be entered or modified:

Attribute	Explanation
I	<p>Line indicator.</p> <p>This field is used by the DDM editor to mark lines.</p> <p>E Lines containing an error detected during execution of a CHECK command.</p> <p>S Lines containing a scanned value.</p> <p>X/Y Lines selected for copy/move operation.</p>
T	<p>Field Type:</p> <p>G Group header</p> <p>M Multiple-value field</p> <p>P Periodic group header</p> <p>* Comment line</p> <p><i>blank</i> Elementary field</p> <p>Note: Groups defined in a DDM need not necessarily be defined as groups in the Adabas FDT</p>
L	<p>Level number assigned to the field.</p> <p>Valid level numbers are 1 - 7.</p> <p>Level numbers should be specified in consecutive ascending order.</p>
DB	<p>For Adabas files, the Adabas two-character field name.</p> <p>For DL/I segment types, the 2-character code which is used in DL/I.</p> <p>For VSAM files, see the documentation Natural for VSAM.</p>
Name	<p>An external field name of 3 to 32 characters.</p> <p>This is the name used within Natural programs to reference the field.</p>
F	<p>Field format.</p> <p>For valid formats, refer to Definition of Format and Length in User-Defined Variables (General Information, Natural Programming Reference documentation).</p>
Leng	<p>Standard field length.</p> <p>This length can be overridden in a Natural program.</p> <p>For numeric fields (format N), the length is specified as <i>nn.m</i>, where <i>nn</i> represents the number of digits before the decimal point and <i>m</i> represents the number of digits after the decimal point.</p>

Attribute	Explanation
S	<p>Null-value suppression option (only for Adabas files):</p> <p>N Indicates that the field is defined with the Adabas null-value suppression option. This means that null values for the field are not stored in the inverted list and are not returned when the field is used in the WITH clause of a FIND statement, or in a HISTOGRAM or READ LOGICAL statement.</p> <p>If the Remarks column contains NC (not counted), an N in this column indicates that the field is defined with the SQL null-value option. Below this field, the corresponding null-indicator field is listed.</p> <p>M Indicates that the field is defined with the SQL null-value option "not null". The Remarks column for this field contains "NN NC" (not null, not counted). Below this field, the corresponding null-indicator field is listed.</p> <p>F Indicates that the field is defined with the Adabas fixed-storage option.</p>
D	<p>Descriptor Option.</p> <p>A Indicates that the field is an alternate index for a VSAM file.</p> <p>D Indicates that the field is an Adabas descriptor.</p> <p>H Indicates that the field is an Adabas hyperdescriptor. A hyperdescriptor is a user exit in Adabas and has to Natural the same functionality as a phonetic descriptor.</p> <p>N Indicates that the field is defined as a non-descriptor. A non-descriptor is not a descriptor, but can be used as a search field for a so-called non-descriptor search.</p> <p>P Indicates that the field is an Adabas phonetic descriptor.</p> <p>S Indicates that the field is an Adabas superdescriptor. If a superdescriptor contains a multiple-value field or a field from a periodic group (or part of such a field), the superdescriptor is marked with an M or a P in the Field Type column; this enables Natural to create the correct search algorithms for this superdescriptor.</p> <p>For a DL/I segment type, S indicates a superdescriptor; that is, a search field of a parent segment.</p> <p>U Indicates that the field is an Adabas subdescriptor. If a subdescriptor contains a multiple-value field or a field from a periodic group (or part of such a field), you have to mark the subdescriptor with an M in the Field Type column. This enables Natural to create the correct search algorithms for this subdescriptor.</p> <p>X Indicates an alternate subdescriptor or superdescriptor; that is, an alternate index for a VSAM file.</p> <p>For VSAM files, see the Natural for VSAM documentation.</p>
Remarks	A comment which applies to a field and/or the DDM.

DDM Editor Commands

Most of the editor and line commands available with the Natural program editor are also available in the DDM editor. Not available are special commands, such as PROFILE, RENUMBER, SET, SHIFT etc. and some line commands. Refer to the description of the program editor in the Natural User's Guide for Mainframes for more details on editor commands.

The following editor commands are also available:

CATALOG

```
CATALOG [DDM-name] [REPLACE]
```

Catalogs the DDM in the work area. If the DDM definition is already cataloged, the replace option must be used.

CHECK

```
CHECK
```

Validates the DDM in the work area against the Adabas FDT. Should any inconsistency occur, the field definition causing the error is marked for correction.

CLEAR

```
CLEAR
```

Clears the work area.

HELP

```
{HELP  
?}
```

Displays editor help information.

LENGTH / SIZE

```
{ LENGTH }  
{ SIZE } [from-field to-field]
```

Calculates the maximum length for one record in bytes. If you specify *from-field* and *to-field*, the length from *from-field* to *to-field* is calculated only.

LIST DDM

```
LIST DDM [DDM-name]
```

Lists another DDM without leaving the DDM editor (corresponds to the system command LIST DDM).

READ

```
READ [DDM-name]
```

Reads a DDM into the work area. Any DDM currently in the work area is overwritten.

QUIT

```
{ QUIT }
```

Leaves the DDM editor. The DDM in the work area is still available until another DDM is read into the work area, the work area is used otherwise (for example, by the program editor) or the Natural session is terminated.

UNCAT

```
UNCAT [DDM-name]
```

Deletes either the DDM currently in the work area or an optionally specified DDM from the current library.

Extended Field Editing

With the DDM editor, you can also enter or modify DDMs at field level. You can specify default options for field headers and edit masks (as well as additional field definitions specific to VSAM files).

The extended editing mode is invoked by entering the line command **.E** in the first positions of the line containing the field. The Extended Field Editing screen is displayed:

```

09:50:05          ***** EDIT DDM (ADA) *****          1999-12-02
                   - Extended Field Editing -
DDM Name EMPLOYEES          Def.Seq.          DBID    0 FNR    316

I T L DB Name          F Leng  S D Remark
----- top -----
   1 AA PERSONNEL-ID          A 8.0    D
-----
Field Header ..... PERSONNEL/ID_____
Field Edit Mask .. _____
    
```

On this screen, you can specify field headers and edit masks to be applied when the field is used in a DISPLAY or INPUT statement, as well as further specifications for VSAM DDMs. All the other information specific to the field (field type, length, name, format, remarks) can also be modified on this screen.

When you press ENTER on this screen (with or without having entered anything), you will be returned to the DDM editor screen.

You can select a range of field definitions for editing by entering **.Ennn** where **nnn** is the number of fields to be selected.

For extended field editing in VSAM DDMs, see the Natural for VSAM documentation.

Delete DDM

This function is used to delete a single cataloged DDM from the system file FDIC.

You have to specify the name of the DDM to be deleted. You are then asked to confirm the deletion on a subsequent screen.

To delete multiple DDMs, you specify a DDM name with asterisk notation. This will automatically invoke the function Delete DDMs of the SYSMAIN utility (see DDMs, as described in the section The SYSMAIN Utility in the Natural Utilities for Mainframes documentation).

The contents of the SYSDDM work area is not affected by the deletion.

When you delete a DDM with SYSDDM, the corresponding Natural Security file profile is automatically deleted, too.

List DDMs

This function corresponds to the system command LIST DDM. It displays a list of the DDMs stored in the specified FDIC system file.

From the list, you can select individual DDMs for further processing.

To select a DDM from the list, you mark it with a command in the Cmd column. For information on possible commands, you enter a question mark (?) in the Cmd column.

For information on other options available, see the system command LIST in the Natural Command Reference documentation.

List DDMs with Additional Information

This function displays a list of the DDMs stored in the specified FDIC system file.

From the list, you can select individual DDMs for further processing.

To select a DDM from the list, you mark it with a command in the C column. For information on possible commands, you enter a question mark (?) in the C column.

For each DDM listed, the following information is displayed:

- Database ID, file number, DDM type, DDM length in bytes;
- Security type (only under Natural Security):
Public, Private, Access or Undef(ined);
- File type: Log.View, Phy.File or Log.File for VSAM DDMs;
Userfile for Super Natural DDMs;
- VSAM name;
- Remarks; for example, SupNat (for a Super Natural DDM)
or the VSAM file organization (KSDS, RRDS, ESDS or VRDS).

Copy DDM to Another FDIC File

This function is used to copy DDMs from one system file (FDIC) and/or database to another. This may be necessary, for example, when a Natural application is transferred from test to production status.

This function uses the function for copying DDMs of the SYSMAN utility (see also DDMs, as described in the section The SYSMAN Utility in the Natural Utilities for Mainframes documentation).

Show Defined DBIDs and Used FNRs

When you invoke this function, a menu will be displayed from which you can select the following functions:

- Database IDs Defined in Natural
- File Numbers of Existing DDMs for a Database

Database IDs Defined in Natural

This function displays a list of all DBIDs defined in NTDB macros of the Natural parameter module, sorted by database types (the NTDB macro is described in Parameter Modules in the Natural Parameter Reference documentation).

The default database type is shown at the top of the screen. DBIDs of the default database type are **not** listed.

File Numbers of Existing DDMs for a Database

This function displays for a given DBID a list of all file numbers for which DDMs have been defined.

You enter the desired DBID on the menu Show Defined DBIDs and Used FNRs when you invoke the function.

You can also invoke this function by entering a DBID in the command line of the screen Database IDs Defined in Natural and pressing PF5.