

# SYSDDM Utility

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

The SYSDDM utility documentation covers the following topics:

- DDMs
- SYSDDM and Predict
- Invoking SYSDDM
- Edit DDM
- Read DDM
- Catalog DDM
- Delete DDM
- List DDMs
- List DDMs with Additional Information
- Show Defined DBIDs and Used FNRs
- Copy DDM to Another FDIC File
- Generate DDM from Adabas FDT

## Related documentation:

- SQL Services (DDM Generation), Natural for DB2.
  - DL/I Services, Natural for DL/I.
  - Adabas documentation
- 

## 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. See the Predict documentation for further information.

## Invoking SYSDDM

 **To invoke the SYSDDM utility**

- In the direct command line, enter SYSDDM.

The SYSDDM Menu is displayed:

```

13:52:14          ***** NATURAL SYSDDM UTILITY *****          2002-07-02
User SAG          - Menu -          FDIC (10,460)
                                     Work area empty

          DDM Maintenance          List/Copy Services

          E Edit DDM          L List DDMs
          R Read DDM          X List DDMs with Additional Information
          C Catalog DDM          S Show Defined DBIDs and Used FNRs
          U Delete DDM          M Copy DDM to Another FDIC File
          ? Help
          . Exit

                                     Other Services

                                     G Generate DDM from Adabas FDT
                                     B SQL Services
                                     D DL/I Services

Code ..... _          FDIC Type ..... A
DDM Name .. _____          DDM Type ..... _
FNR ..... 0          DBID .. 0          Adabas Password ..
Replace ... N          DBID Type ..... 7

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

## Overview of Functions

The SYSDDM Menu is organized in the sections DDM Maintenance, List/Copy Services and Other Services and provides the following functions:

<b>Function</b>	<b>Explanation</b>
Edit DDM	Reads a DDM from the system file FDIC into the SYSDDM work area, and invokes the DDM editor.
Read DDM	Reads a DDM from the system file FDIC into the SYSDDM work area but does not invoke the DDM editor.
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.
Delete DDM	Deletes a cataloged DDM from the system file FDIC.
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 System 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	Shows you which DBIDs are defined, as well as all file numbers of a given DBID for which DDMs have been defined.
Copy DDM to Another FDIC File	Copies a DDM from one FDIC system file to another.
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.
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 DDM Generation in the documentation Natural for DB2.
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. The function DL/I Services is described in the documentation Natural for DL/I.

The following parameters can be specified on the SYSDDM 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 C Command Processor S Super Natural E Entire DB Engine
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 (for example, 5, 6 or 7) is displayed.

## Edit DDM

This function reads a DDM from the system file FDIC, places it into the SYSDDM work area and invokes the DDM editor.

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

Below is information on:

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

## DDM Editor

**▶ To invoke the DDM Editor for modifying or creating a DDM**

- On the SYSDDM Menu, enter Function Code **E** and the name of an existing DDM.

Or, to create a new DDM, on the SYSDDM Menu, enter Function Code **E** and do not specify a DDM name. If the work area contains any data after the DDM editor is invoked, enter **CLEAR** in the direct command line.

The Edit DDM screen is displayed, similar to the one below:

```

16:03:29                ***** Edit DDM (ADA) *****                2002-07-02
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                D
*                C=NNNNNNN
*                C=COUNTRY
G 1 AB FULL-NAME
  2 AC FIRST-NAME                A                20                N
  2 AD MIDDLE-I                A                1                N
  2 AE NAME                A                20                D
  1 AD MIDDLE-NAME                A                20                N
  1 AF MAR-STAT                A                1                F
*                M=MARRIED
*                S=SINGLE
*                D=DIVORCED
*                W=WIDOWED
  1 AG SEX                A                1                F
  1 AH BIRTH                D                6                D
  1 AH N$BIRTH                I                2                D
G 1 A1 FULL-ADDRESS
DDM EMPLOYEES read into source area.
    
```

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

Title and header of the DDM editor contain the following information:

Edit DDM ( <i>DDM-type</i> )	<p>The value displayed in parentheses next to the map title Edit DDM denotes the type of DDM.</p> <p>Possible types are:</p> <p>ADA          Adabas</p> <p>VSAM</p> <p>DB2</p> <p>DL/I</p> <p>PROCESS    Entire System Server</p> <p>CMD-PROC   Command Processor</p> <p>SNAT        Super Natural</p> <p>ENTIREDB   Entire DB Engine</p>
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. See also the Natural READ statement as described in the Natural Statements documentation.
DBID	<p>The database which contains the file to be accessed with the DDM.</p> <p>If 0 (zero) is specified, the default DBID for the Natural user system file (FUSER) as defined in the Natural parameter module is used.</p>
FNR	<p>The number of the file being referenced.</p> <p>If an Adabas file is used, the Adabas file number must be entered.</p> <p>If a DL/I segment type is used, the file number specified is used internally by Natural for DL/I.</p> <p>For VSAM files, see the Natural for VSAM documentation.</p>

## 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>

Attribute	Explanation
T	<p>Field Type:</p> <ul style="list-style-type: none"> <li>G Group header</li> <li>M Multiple-value field</li> <li>P Periodic group header</li> <li>* Comment line</li> <li><i>blank</i> Elementary field</li> </ul> <p><b>Note:</b> 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 must 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 (Natural Statements 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> <p>For dynamic fields, the length may be specified as DYNAMIC.</p>
S	<p>Null-value suppression option (only for Adabas files):</p> <ul style="list-style-type: none"> <li>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. 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.</li> <li>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.</li> <li>F Indicates that the field is defined with the Adabas fixed-storage option.</li> </ul>

Attribute	Explanation
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 in 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 <b>M</b> or a <b>P</b> in the Field Type column; this enables Natural to create the correct search algorithms for this superdescriptor. For a DL/I segment type, <b>S</b> indicates a superdescriptor; that is, a search field of a parent segment.</p> <p>U Indicates that the field is an Adabas subdescriptor or Adabas collation descriptor.</p> <p>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 <b>M</b> in the Field Type column. This enables Natural to create the correct search algorithms for this subdescriptor.</p> <p>A collation descriptor is used to sort (collate) descriptor field values in a non-standard sequence. If a field is a collation descriptor, the Remark column (see below) reads: Collation, the number of the Adabas user exit that contains the collation sequence (1-8) and the short name of the parent field to which the collation sequence applies, for example, Collation 5 on AA.</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 and some line commands. For more details on editor commands, refer to the relevant section in Program Editor in the Natural Editors documentation.

The following editor commands are also available:

### CATALOG

<b>CATALOG</b> [ <i>DDM-name</i> ]    [ <b>REPLACE</b> ]
--

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 }** [ *from-field to-field* ]  
**{ SIZE }**

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

**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 modify individual field attributes. You can specify default options for field headers and edit masks (as well as additional field definitions specific to VSAM files).

**To invoke the extended editing mode**

- Next to the field desired, position your cursor at Column **T** and type in the line command **.E** over the values in Columns **T** and **L**.

The Extended Field Editing screen for the field marked with the command is displayed:

```
17:38:04          ***** Edit DDM (ADA) *****          2002-07-02
                - Extended Field Editing -
DDM Name EMPLOYEEES          Def.Seq.          DBID          0 FNR          316
I T L DB Name          F          Leng S D
----- top -----
  1 AA PERSONNEL-ID          A          8          D
-----
Remark .....
Field Header ..... PERSONNEL/ID
Field Edit Mask ..
```

On the Extended Field Editing screen, you can specify field headers, edit masks and comments (remarks) 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 return to the Edit DDM 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.

## Read DDM

This function reads a DDM from the system file FDIC and places it into the SYSDDM work area. However, unlike the function Edit DDM, Read DDM does not invoke the DDM editor.

## Catalog DDM

To catalog a DDM, you either select the function Catalog DDM on the SYSDDM 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).

If the DBID is not entered, it 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.

## 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 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 all options available with the system command LIST, see the relevant section in the Natural System 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).

## 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 the Natural Parameter Reference documentation).

The default database type is shown at the top of the screen. DBIDs of all database types, except the default, are 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.

## 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 SYSMAIN utility (see also DDMs, as described in the section SYSMAIN Utility in the Natural Utilities documentation).

## 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.