

# Parameters to Influence the Output of Fields

This chapter discusses the use of those Natural profile and/or session parameters which you can use to control the output format of fields.

The following topics are covered:

- Overview of Field-Output-Relevant Parameters
  - Leading Characters - LC Parameter
  - Unicode Leading Characters - LCU Parameter
  - Insertion Characters - IC Parameter
  - Unicode Insertion Characters - ICU Parameter
  - Trailing Characters - TC Parameter
  - Unicode Trailing Characters - TCU Parameter
  - Output Length - AL and NL Parameters
  - Display Length for Output - DL Parameter
  - Sign Position - SG Parameter
  - Identical Suppress - IS Parameter
  - Zero Printing - ZP Parameter
  - Empty Line Suppression - ES Parameter
  - Further Examples of Field-Output-Relevant Parameters
- 

## Overview of Field-Output-Relevant Parameters

Natural provides several profile and/or session parameters you can use to control the format in which fields are output:

| Parameter        | Function  |
|------------------|---|
| LC, IC and TC    | With these session parameters, you can specify characters that are to be displayed before or after a field or before a field value.                   |
| LCU, ICU and TCU | With these session parameters, you can specify characters in Unicode format that are to be displayed before or after a field or before a field value. |
| AL and NL        | With these session parameters, you can increase or reduce the output length of fields.  |
| DL               | With this session parameter, you can specify the default output length for an alphanumeric map field of format U.                                     |
| SG               | With this session parameter, you can determine whether negative values are to be displayed with or without a minus sign.                              |
| IS               | With this session parameter, you can suppress the display of subsequent identical field values.   |
| ZP               | With this profile and session parameter, you can determine whether field values of 0 are to be displayed or not.                                      |
| ES               | With this session parameter, you can suppress the display of empty lines generated by a DISPLAY or WRITE statement.                                   |

These parameters are discussed in the following sections.

## Leading Characters - LC Parameter

With the session parameter LC, you can specify leading characters that are to be displayed immediately *before a field* that is output with a DISPLAY statement. The width of the output column is enlarged accordingly. You can specify 1 to 10 characters.

By default, values are displayed left-justified in alphanumeric fields and right-justified in numeric fields. (These defaults can be changed with the AD parameter; see the *Parameter Reference*). When a leading character is specified for an alphanumeric field, the character is therefore displayed immediately before the field value; for a numeric field, a number of spaces may occur between the leading character and the field value.

The LC parameter can be used with the following statements:

- FORMAT
- DISPLAY

The LC parameter can be set at statement level and at element level.

## Unicode Leading Characters - LCU Parameter

The session parameter LCU is identical to the session parameter LC. The difference is that the leading characters are always stored in Unicode format.

This allows you to specify leading characters with mixed characters from different code pages, and assures that always the correct character is displayed independent of the installed system code page.

For further information, see *Unicode and Code Page Support in the Natural Programming Language, Session Parameters*, section *EMU, ICU, LCU, TCU versus EM, IC, LC, TC*.

The parameters LCU and ICU cannot both be applied to one field.

## Insertion Characters - IC Parameter

With the session parameter IC, you specify the characters to be inserted in the column immediately *preceding the value of a field* that is output with a DISPLAY statement. You can specify 1 to 10 characters.

For a numeric field, the insertion characters will be placed immediately before the first significant digit that is output, with no intervening spaces between the specified character and the field value. For alphanumeric fields, the effect of the IC parameter is the same as that of the LC parameter.

The parameters LC and IC cannot both be applied to one field.

The IC parameter can be used with the following statements:

- FORMAT
- DISPLAY

The IC parameter can be set at statement level and at element level.

## Unicode Insertion Characters - ICU Parameter

The session parameter ICU is identical to the session parameter IC. The difference is that the insertion characters are always stored in Unicode format.

This allows you to specify insertion characters with mixed characters from different code pages, and assures that always the correct character is displayed independent of the installed system code page.

For further information, see *Unicode and Code Page Support in the Natural Programming Language, Session Parameters*, section *EMU, ICU, LCU, TCU versus EM, IC, LC, TC*.

The parameters LCU and ICU cannot both be applied to one field.

## Trailing Characters - TC Parameter

With the session parameter TC, you can specify trailing characters that are to be displayed immediately *to the right of a field* that is output with a DISPLAY statement. The width of the output column is enlarged accordingly. You can specify 1 to 10 characters.

The TC parameter can be used with the following statements:

- FORMAT
- DISPLAY

The TC parameter can be set at statement level and at element level.

## Unicode Trailing Characters - TCU Parameter

The session parameter TCU is identical to the session parameter TC. The difference is that the trailing characters are always stored in Unicode format.

This allows you to specify trailing characters with mixed characters from different code pages, and assures that always the correct character is displayed independent of the installed system code page.

For further information, see *Unicode and Code Page Support in the Natural Programming Language, Session Parameters*, section *EMU, ICU, LCU, TCU versus EM, IC, LC, TC*.

## Output Length - AL and NL Parameters

With the session parameter AL, you can specify the *output length for an alphanumeric field*; with the NL parameter, you can specify the *output length for a numeric field*. This determines the length of a field as it will be output, which may be shorter or longer than the actual length of the field (as defined in the DDM for a database field, or in the DEFINE DATA statement for a user-defined variable).

Both parameters can be used with the following statements:

- FORMAT
- DISPLAY
- WRITE
- PRINT
- INPUT

Both parameters can be set at statement level and at element level.

### Note:

If an edit mask is specified, it overrides an NL or AL specification. Edit masks are described in *Edit Masks - EM Parameter*.

## Display Length for Output - DL Parameter

### Note:

You should use the Web I/O Interface to make use of the full functionality of the DL parameter. When using the terminal emulation, it is not possible, for example, to scroll in a field when the value defined with DL is smaller than the field length.

With the session parameter DL, you can specify the *display length for a field of format A or U*, since the display width of a Unicode string can be twice the length of the string, and the user must be able to display the whole string. The default will be the length, for example, for a format/length U10, the display length can be 10 to 20, whereas the default length (when DL is not specified) is 10.

The session parameter DL can be used with the following statements:

- FORMAT
- DISPLAY
- WRITE
- PRINT
- INPUT

The session parameter DL can be set at statement level and at element level.

The difference between the session parameters AL and DL is that AL defines the data length of a field whereas DL defines the number of columns which are used on the screen for displaying the field. The user can scroll in input fields to view the entire content of a field if the value specified with the DL session parameter is less than the length of the field data.

Using the DL parameter with a length that is smaller than the length of the field is only recommended with the Web I/O Interface. When running Natural in a terminal emulation, scrolling in a field is not possible and so the effect is the same as using the AL parameter. Moreover, when changing the field contents, all characters which are beyond the display length will be lost.

#### Note:

DL is allowed for A-format fields as well. In conjunction with the Web I/O Interface, this would allow making the edit control size smaller than the content of a field.

#### Example:

```
DEFINE DATA LOCAL
1   #U1 (U10)
1   #U2 (U10)
END-DEFINE
*
#U1 := U'latintxt00'
#U2 := U'特别是伺服器都需要支'
*
INPUT (AD=M) #U1 #U2
END
```

The above program produces the following output where the content of the field #U2 is incomplete:

```
#U1 latintxt00 #U2 特别是伺服
```

When the session parameter DL is used with the field #U2 and is specified accordingly, the content of this field will be displayed correctly:

```

DEFINE DATA LOCAL
1   #U1 (U10)
1   #U2 (U10)
END-DEFINE
*
#U1 := U'latintxt00'
#U2 := U'特别是伺服器都需要支'
*
INPUT (AD=M) #U1 #U2 (DL=20)
END

```

Result:

```
#U1 latintxt00 #U2 特别是伺服器都需要支
```

## Sign Position - SG Parameter

With the session parameter SG, you can determine whether or not a sign position is to be allocated for numeric fields.

- By default, SG=ON applies, which means that a sign position is allocated for numeric fields.
- If you specify SG=OFF, negative values in numeric fields will be output without a minus sign (-).

The SG parameter can be used with the following statements:

- FORMAT
- DISPLAY
- PRINT
- WRITE
- INPUT

The SG parameter can be set at both statement level and element level.

### Note:

If an edit mask is specified, it overrides an SG specification. Edit masks are described in *Edit Masks - EM Parameter*.

## Example Program without Parameters

```

** Example 'FORMAX03': FORMAT (without FORMAT and compare with FORMAX04)
*****
DEFINE DATA LOCAL
1 VIEWEMP VIEW OF EMPLOYEES
  2 NAME
  2 FIRST-NAME
  2 SALARY (1:1)
  2 BONUS (1:1,1:1)
END-DEFINE
*
READ (5) VIEWEMP BY NAME STARTING FROM 'JONES'
  DISPLAY NAME
    FIRST-NAME

```

```

        SALARY (1:1)
        BONUS  (1:1,1:1)
END-READ
END
    
```

The above program contains no parameter settings and produces the following output:

```

Page          1                                04-11-11  11:11:11

        NAME          FIRST-NAME          ANNUAL          BONUS
        SALARY
-----
JONES          VIRGINIA          46000          9000
JONES          MARSHA          50000          0
JONES          ROBERT          31000          0
JONES          LILLY          24000          0
JONES          EDWARD          37600          0
    
```

### Example Program with Parameters AL, NL, LC, IC and TC

In this example, the session parameters AL, NL, LC, IC and TC are used.

```

** Example 'FORMAX04': FORMAT (with parameters AL, NL, LC, TC, IC and
** compare with FORMAX03)
*****
DEFINE DATA LOCAL
1 VIEWEMP VIEW OF EMPLOYEES
  2 NAME
  2 FIRST-NAME
  2 SALARY (1:1)
  2 BONUS  (1:1,1:1)
END-DEFINE
*
FORMAT AL=10 NL=6
*
READ (5) VIEWEMP BY NAME STARTING FROM 'JONES'
  DISPLAY NAME          (LC=*)
  FIRST-NAME          (TC=*)
  SALARY (1:1)          (IC=$)
  BONUS (1:1,1:1)      (LC=>)
END-READ
END
    
```

The above program produces the following output. Compare the layout of this output with that of the previous program to see the effect of the individual parameters:

```

Page          1                                04-11-11  11:11:11

        NAME          FIRST-NAME          ANNUAL          BONUS
        SALARY
-----
*JONES          VIRGINIA          *  $46000 >  9000
*JONES          MARSHA          *  $50000 >   0
*JONES          ROBERT          *  $31000 >   0
*JONES          LILLY          *  $24000 >   0
*JONES          EDWARD          *  $37600 >   0
    
```

As you can see in the above example, any output length you specify with the AL or NL parameter does not include any characters specified with the LC, IC and TC parameters: the width of the NAME column, for example, is 11 characters - 10 for the field value (AL=10) plus 1 leading character.

The width of the SALARY and BONUS columns is 8 characters - 6 for the field value (NL=6), plus 1 leading/inserted character, plus 1 sign position (because SG=ON applies).

## Identical Suppress - IS Parameter

With the session parameter IS, you can suppress the display of identical information in successive lines created by a WRITE or DISPLAY statement.

- By default, IS=OFF applies, which means that identical field values will be displayed.
- If IS=ON is specified, a value which is identical to the previous value of that field will not be displayed.

The IS parameter can be specified

- with a FORMAT statement to apply to the whole report, or
- in a DISPLAY or WRITE statement at both statement level and element level.

The effect of the parameter IS=ON can be suspended for one record by using the statement SUSPEND IDENTICAL SUPPRESS; see the *Statements* documentation for details.

Compare the output of the following two example programs to see the effect of the IS parameter. In the second one, the display of identical values in the NAME field is suppressed.

### Example Program without IS Parameter

```
** Example 'FORMAX05': FORMAT (without parameter IS
**                               and compare with FORMAX06)
*****
DEFINE DATA LOCAL
1 VIEWEMP VIEW OF EMPLOYEES
  2 NAME
  2 FIRST-NAME
END-DEFINE
*
READ (3) VIEWEMP BY NAME STARTING FROM 'JONES'
  DISPLAY NAME FIRST-NAME
END-READ
END
```

The above program produces the following output:

```
Page          1                               04-11-11  11:11:11

          NAME                               FIRST-NAME
-----
JONES          VIRGINIA
JONES          MARSHA
JONES          ROBERT
```



## Example Program with IS Parameter

```

** Example 'FORMAX06': FORMAT (with parameter IS
**                          and compare with FORMAX05)
*****
DEFINE DATA LOCAL
1 VIEWEMP VIEW OF EMPLOYEES
  2 NAME
  2 FIRST-NAME
END-DEFINE
*
FORMAT IS=ON
*
READ (3) VIEWEMP BY NAME STARTING FROM 'JONES'
  DISPLAY NAME FIRST-NAME
END-READ
END

```

The above program produces the following output:

```

Page          1                               04-11-11  11:54:01

          NAME                FIRST-NAME
-----
JONES                VIRGINIA
                   MARSHA
                   ROBERT

```

## Zero Printing - ZP Parameter

With the profile and session parameter ZP, you determine how a field value of zero is to be displayed.

- By default, ZP=ON applies, which means that one 0 (for numeric fields) or all zeros (for time fields) will be displayed for each field value that is zero.
- If you specify ZP=OFF, the display of each field value which is zero will be suppressed.

The ZP parameter can be specified

- with a FORMAT statement to apply to the whole report, or
- in a DISPLAY or WRITE statement at both statement level and element level.

Compare the output of the following two example programs to see the effect of the parameters ZP and ES.

## Empty Line Suppression - ES Parameter

With the session parameter ES, you can suppress the output of empty lines created by a DISPLAY or WRITE statement.

- By default, ES=OFF applies, which means that lines containing all blank values will be displayed.

- If ES=ON is specified, a line resulting from a DISPLAY or WRITE statement which contains all blank values will not be displayed. This is particularly useful when displaying multiple-value fields or fields which are part of a periodic group if a large number of empty lines are likely to be produced.

The ES parameter can be specified

- with a FORMAT statement to apply to the whole report, or
- in a DISPLAY or WRITE statement at statement level.

**Note:**

To achieve empty suppression for numeric values, in addition to ES=ON the parameter ZP=OFF must also be set for the fields concerned in order to have null values turned into blanks and thus not output either.

Compare the output of the following two example programs to see the effect of the parameters ZP and ES.

### Example Program without Parameters ZP and ES

```
** Example 'FORMAX07': FORMAT (without parameter ES and ZP
**                               and compare with FORMAX08)
*****
DEFINE DATA LOCAL
1 VIEWEMP VIEW OF EMPLOYEES
  2 NAME
  2 FIRST-NAME
  2 BONUS (1:2,1:1)
END-DEFINE
*
READ (4) VIEWEMP BY NAME STARTING FROM 'JONES'
  DISPLAY NAME FIRST-NAME BONUS (1:2,1:1)
END-READ
END
```

The above program produces the following output:

```
Page      1                               04-11-11  11:58:23
```

| NAME  | FIRST-NAME | BONUS |
|-------|------------|-------|
| JONES | VIRGINIA   | 9000  |
| JONES | MARSHA     | 6750  |
| JONES | ROBERT     | 0     |
| JONES | LILLY      | 0     |

### Example Program with Parameters ZP and ES

```
** Example 'FORMAX08': FORMAT (with parameters ES and ZP
**                               and compare with FORMAX07)
*****
DEFINE DATA LOCAL
1 VIEWEMP VIEW OF EMPLOYEES
  2 NAME
  2 FIRST-NAME
  2 BONUS (1:2,1:1)
```

```

END-DEFINE
*
FORMAT ES=ON
*
READ (4) VIEWEMP BY NAME STARTING FROM 'JONES'
  DISPLAY NAME FIRST-NAME BONUS (1:2,1:1) (ZP=OFF)
END-READ
END

```

The above program produces the following output:

```

Page      1                                04-11-11  11:59:09

      NAME                FIRST-NAME        BONUS
-----
JONES                VIRGINIA                9000
                        6750
JONES                MARSHA
JONES                ROBERT
JONES                LILLY

```

## Further Examples of Field-Output-Relevant Parameters

For further examples of the parameters LC, IC, TC, AL, NL, IS, ZP and ES, and the SUSPEND IDENTICAL SUPPRESS statement, see the following example programs:

- *DISPLX17 - DISPLAY (with NL, AL, IC, LC, TC)*
- *DISPLX18 - DISPLAY (using default settings for SF, AL, UC, LC, IC, TC and compare with DISPLX19)*
- *DISPLX19 - DISPLAY (with SF, AL, LC, IC, TC and compare with DISPLX18)*
- *SUSPEX01 - SUSPEND IDENTICAL SUPPRESS (in conjunction with parameters IS, ES, ZP in DISPLAY)*
- *SUSPEX02 - SUSPEND IDENTICAL SUPPRESS (in conjunction with parameters IS, ES, ZP in DISPLAY). Identical to SUSPEX01, but with IS=OFF.*
- *COMPRX03 - COMPRESS*