

2L FIELD DEVELOPER v 7.1

Field descriptions in detail

There are 3 different kinds of elements that can be used on forms:

1. The passive elements: Text, Frame and Picture

These elements will only be shown on the screen, but have no user interaction or data set relation.

2. The data fields: Display data, Alphanumeric input, Memo input, Numeric input, Logical field, Calculated field, Selection list and Stack field

These fields normally have a data set relation.

3. The action elements: Button and Icon

These elements must have at least a start function to work.

1. The passive elements

The passive elements consist of three types of elements: Text (T-field), Frame (F-field) and Picture (P-field). These elements can not be changed by the handheld user.

Note: Passive elements can not be used in spreadsheets.

1.1 Text (T-field)

Text can be displayed anywhere on the screen, in different font sizes, in reverse video and centered on the screen. A text field can be made by clicking with the right mouse button in the painting screen and selecting the option "textfield". A text field is recognizable by its light gray color. The position you clicked with the mouse will be the upper left corner of this text field.

When you add a new text field, you can specify;

- * Text: Here you can enter the text to be displayed on the screen.
- * Center text: Check this box to center the text horizontally.
- * Reverse video: With this option checked the background will be black and the text will be white.
- * Bold: The text will use a bold font
- * The font size: From 1= Small font up till 8= Giga font

1.2 Frame (F-field)

A frame field is a very simple rectangular area. It can be recognized as a transparent area with a black border.

A Frame can be used to visually separate or combine other field elements on the screen. The following options can be specified for a frame:

- * Reverse video: With this option checked the background will be black.
- * Height: Specify the display height of the frame.
- * Width: Specify the display width of the frame.

1.3 Picture field (P-field)

A Picture field can display a bitmap picture (BMP-file) on your form.

When you add a New Picture (P) in the form painting screen, you can either specify a fixed picture (Picture from file) or a picture using a reference (Picture from field).

With Picture from file you select an existing BMP, a Picture field will be shown (white rectangle) sized according to the actual size of the Bitmap file.



With Picture from field you can create a reference to a picture depending on the contents of the reference field.

Note: Only bitmap pictures (BMP-files) can be used to display pictures in your forms on the handheld. Other picture files can not be integrated in your form, but can be used on the handheld. To view these pictures use the RUN <picture> command.

2. The data fields

2.1 Text input field (A-field)

Text input fields, or Alphanumeric input fields, are used for displaying and editing text.

When you add an A-field a screen will pop-up where you can specify:

- * Fieldname: this name will appear in the form painting screen, it can be used as a reference in the data set and also as a reference for commands and lists.
- * Description: this description will be shown to the handheld user at the top of the handheld screen.
- * Use list: here you can specify a list for the A-field (This list has to be available in the project). When the user selects an input-field with a list it will be shown. Now he can select the available values in the list. (See chapter 5)
- * Maximum input length: this amount can vary from 0 up to 150. The minimum display width depends on the input length and the selected font size. When you reselect the field the program will check this minimum display width, and if the actual display width is too small, the program will automatically increase this to minimum required.
- * Obligatory: if you select this option you make sure that this field has an input. If the field is not filled in, a message will appear: "Attention <field> Obl. field is empty!!!", the cursor will now automatically go to this field and the handheld user first has to fill in this field before he can continue to the next record.

2.2 Numeric input field (N-field)

A Numeric input field can only be filled in with numbers as input, with a maximum input length and/or decimals as specified in the field definition.

When you add a new numeric input field a screen will pop-up where you can define:

- * Fieldname: This name will appear in the form painting screen and can be used as a reference for example in commands.
- * Description: This description will be shown to the handheld user at the top of the handheld screen.
- * Maximum input length: This amount can vary from 0 up to 20.
Note: the minimum display width depends on the input length and the selected font size. When you reselect the field the program will check this minimum display width, and if the actual display width is too small, the program will automatically increase this to the minimum width required.
- * Number of decimals: This number can vary from 0 up to 5. The dot will also be seen as a decimal.
- * A minimum value: The value of the number entered will be compared to the minimum value. When it is lower than the minimum value a message will appear at the top of the handheld, that the value entered is lower than the minimum value.
- * A maximum value: The value of the number entered will be compared to the maximum value. If the value entered is higher than the maximum value, the handheld user will be asked to confirm this number with a warning that the number entered is higher than the maximum value.
- * A standard value: The standard value will be prefilled in the field for every new record.
- * Obligatory: if you select this option you make sure that this field has an input. If the field is not filled in, a message will appear: "Attention <field> Obl. field is empty!!!", the cursor will now automatically go to this field and the handheld user first has to fill in this field before he can continue to the next record.

2.3 Logical field (L-field)

A logical field is displayed on the handheld screen as a checkbox. Clicking on the field changes the status from tagged (logical 1) to untagged (logical 0) and so on.

When you add a new L-field a screen will pop-up from where you can specify:

- * Fieldname: This name will appear in the form painting screen and can be used as a reference for example in commands.
 - * Description checked What to display when the checkbox was checked
 - * Description unchecked What to display when the checkbox was unchecked
- You specify via the description for this L-field what to display when the status is tagged, and what to display when it is not tagged.

Note: When you edit a L-field and want to change the description always use a '/' between the two possibilities and always put them in the order tagged/not tagged.

A description could look like:

OK / WRONG.

2.4 Memo input field (M-field)

A memo input field is a multi-line alphanumeric input field. Apart from the specifications of an A-field you can specify the maximum amount of input-lines in the memo-field.

Note: a memo input field cannot be combined with a list.

When you add a new M-field you can specify:

- * Fieldname: This name will appear in the form painting screen and can be used as a reference for example in commands.
- * Description: This description will be shown to the handheld user on top of the handheld screen.
- * Maximum input length this amount can vary from 0 up to 250. The minimum display width depends on the input length and the selected font size. When you reselect the field the program will check this minimum display width, and if the actual display width is too small, the program will automatically increase this to minimum required.
- * Max. # lines the maximum number of lines that can be used in the memo field
- * Obligatory if you select this option you make sure that this field has an input. If the field is not filled in, a message will appear: "Attention <field> Obl. field is empty!!!", the cursor will now automatically go to this field and the handheld user first has to fill in this field before he can continue to the next record.

2.5 Stack field (S-field, with Stack option)

A selection list (S-field) with the Stack option specified is called a Stack field, they are displayed as green listboxes.

When you add a new S-field you can specify:

- * Fieldname: This name will appear in the form painting screen and can be used as a reference for example in commands.
- * Description: This description will be shown to the handheld user on top of the handheld screen.
- * Use list: You can specify the list you want to use. (See chapter 5)

Note: the list has to be available in the project folder.

Using LIST commands the user can add items to the stack and remove items from the stack without the use of numerous new records for each stacked value. Furthermore Stack fields can be combined with calculated fields for statistical analyses (see 2.6.2).

2.6 Selection list (S-field)

A selection list is comparable to an A-field, with a list attached to it, and the option List-only. The difference is that it's easier for the user to select an item from a selection list. S-fields can be recognized by their green colour. A special selection list is the Stack-field (see 2.8).

When you add a new S-field you can specify:

- * Fieldname: This name will appear in the form painting screen and can be used as a reference for example in commands.



- * Description: This description will be shown to the handheld user on top of the handheld screen.
- * Use list: Here you can specify the list you want to use.
Note: the list has to be available in the project folder. (See chapter 5)

2.7 Display data (D-field)

A D-field is a noneditable field in which you refer to data in a data set, to be shown in the form. When you add a new Display data field a screen will pop-up where you can specify the name of the D-field and specify the maximum input length of the D-field.

If the name of a D-field matches the name of a column in a data set, the contents will be displayed as a (grayed) noneditable text in a box. D-fields will never be created automatically by 2L from a data set, you always have to change a field into a D-field.

The difference between a D-field and a read-only field is that an empty field in read-only mode can be filled in (and after that it is not editable anymore) and a D-field is never editable, not even when the specific field is empty.

When you add a new D-field you can specify:

- * Fieldname: This name will appear in the form painting screen and can be used as a reference for example in commands.
- * Maximum input length: this amount can vary from 0 up to 150. The minimum display width depends on the input length and the selected font size. When you reselect the field the program will check this minimum display width, and if the actual display width is too small, the program will automatically increase this to minimum required.

2.8 Calculated field (C-field)

These fields represent a calculated value based on the values of other (calculated) fields in the same record. Calculated fields can be recognized by their purple colour. The calculation for this field must be specified in the description of this element. It can be specified either as a simple formula or as a statistical function (see 2.8.2).

When you add a new calculated field a screen will pop-up from where you can choose:

- * Fieldname: this name will appear in the form painting screen and can be used as a reference for example in commands.
- * Arithmetic formula or statistical function
 - * Arithmetic formula
 - * Value/Field1: Fill in a standard value or the name of a field used in the same form
 - * Operator: Select in +(add), -(subtract), /(divide), *(multiply) or &(concatenate)
 - * Value/Field2: Fill in a standard value or the name of a field used in the same form
 - * Calculation: Resulting formula which can be edited to make your own calculation, without the use of Value/Field1; Operator; Value/Field2
 - * Statistical function
 - * Function: Choose the function you want to use
 - * Statistical: Field refers to a S(stack)-field
 - * Calculation: Resulting formula which can be edited to make your own calculation, without the use of Function and Statistical field
- * Maximum display length
- * Hide this field: Check this box to hide the field, useful for intermediate calculated fields

It is also possible to calculate the difference between two dates in a calculated field. Make sure you specify a correct date format via SAVETOREG DATEFORMAT so that the difference can be calculated correctly, if the date format in both fields is not the same the outcome will be 0 or a completely wrong figure. The difference between two dates will always be calculated in days.

Note that if you use the input of a calculated field in another calculated field, the program will use the rounded off input from the already calculated fields depending on the amount of decimals specified for this field. E.g.: N1(=1), N2(=9) and N3(=10) are N-fields. C4 is defined as $A1/A2(=1/9=0.1111)$ and you specified the number of decimals as 0, this will be rounded off to 0. Now C5 is defined as $C4*N3(0*10=0)$, while it should be $0.1111*10=1.111$. The only way to avoid this is by specifying the amount of decimals you want to use. The more decimals you specify the more accurate the calculation can be.

2.8.1 Simple formulas

Field	Description
C1	$N2+12.5$
CIRC	$3.14*R6$
AVG	WEIGHT/COUNT

These are examples of simple formulas. In the formula you must specify 2 fields and/or values separated by an operator.

The operator can be - (subtract), + (add), * (multiply) or / (divide).

Note: division by zero will be shown as ZZZ in the calculated field.

If you want more complex calculations, you just specify more calculated fields and refer to them as intermediate results.

The intermediate results can be specified as hidden fields if you do not want them to be shown.

Very important is that you always have to position the calculations in the order they should be calculated. So if field Cx refers to field Cy, the field Cy should be positioned above field Cx.

Alternatively you can break down your complex formula into a series of simple formulas and enter these simple formulas in a calculation command file. Specify the command CMD <calculation command file> as the start function of the calculated field.

Press Field definition details, or Edit Field to specify the number of decimals. (See Chapter 4)

2.8.2 Statistical functions

Instead of a formula, a calculated field can have a statistical function based on the values in a stackfield.

Function	Description
CNT	counts the number of measurements in the stackfield.
CUM	adds all the values of the measurements in the stackfield.
AVG	average adds all the values of the measurements in the stack and divides them by the number of measurements in the stack
MIN	shows the lowest value of the measurements in the stack.
MAX	shows the highest value of the measurements in the stack.
SD	calculates the standard deviation of the measurements in the stack.

3. Buttons and Icons

All buttons and icons are noneditable elements, with a user interaction based on a start function. Icons can be seen as a special button with a picture on it.

3.1 Standard Button

A standard Button (B-field) can be defined anywhere on the screen, they have a characteristic grey colour. Buttons will only work when there is a valid command specified as start function. Buttons can also have an end function and a cancel function.

When you add a new button field you can specify:

- * Buttonname: This is the name that will refer to the button.
- * Description: This is the description that will be shown on the button
- * Start function: This function will be carried out when the button is pressed, double click the box to choose a command from the list of valid commands.
- * End function: This function will be carried out when the start function has been carried out, double click the box to choose a command from the list of valid commands.
- * Cancel function: This function will be carried out when the start and/or end function were not carried out properly, double click the box to choose a command from the list of valid commands.
- * Action menu button: Check this box to make this an action menu button, which means that it can be chosen from the forms menu, if specified (see 3.2).

A list of valid commands is available as a separate document.



The start function is the command that is to be carried out when the user presses the button. If this start function could be carried out properly, the end function (if specified) will be carried out consequently.

If however the start function (or the end function) failed the cancel function will be carried out (e.g. an ALERT or ERROR command).

If you have created a form with more than one screen, and buttons with f.e. record scroll functions, it is very easy to display these Buttons on all your pages (specify the Page mode option for these buttons).

3.2 Menu Button

A Menubutton (B1-button) is just the same as a standard button, with two additional features:

1. If you have disabled editing in this form, you can still use Menu buttons (you cannot use standard buttons in Read-only forms).
2. If you have enabled a menu in your form, the Button can also be activated from the menu (Extra section).

3.3 Standard Icon

A standard Icon is an extension of a standard Button, with a Bitmap picture instead of a Button text. The Picture must be available as Bitmap file in the project folder. If not the Icon will be shown as a standard Button.

When you add a new Icon you can specify;

- * Iconname: This is the name that will refer to the icon.
- * Picture: This Picture will be shown on the Icon on the handheld
- * Start function: This function will be carried out when the buton is pressed, double click the box to choose a command from the list of valid commands.
- * End function: This function will be carried out when the start function has been carried out, double click the box to choose a command from the list of valid commands.
- * Cancel function: This function will be carried out when the start and/or end function were not carried out properly, double click the box to choose a command from the list of valid commands.
- * Action menu button: Check this box to make this an action menu button, which means that it can be chosen from the forms menu, if specified (see 3.2).

For the rest, an Icon works exactly the same as a Button.

3.4 Menu Icon

Just like a menu Button (B1-field), an Icon can also be specified as Menu icon (I1-field).

4 Field Definition Details

Input fields, buttons and icons have a number of possibilities that you can specify in the field definition details screen. This screen will pop-up when you select a field, button or icon, press the right mouse button and select Edit.

The first block on the right side is (almost) similar to the selections you could make when creating the fields. Here you can change the selections.

- * Screen Here you can specify or change the screen number on which the field will be placed.
- * Fieldname This name will appear in the form painting screen and can be used as a reference for example in commands.
- * Description This description will be shown to the handheld user at the top of the handheld screen.
- * Row Here you can fill in the exact pixel in the row where the field should be placed.
- * Column Here you can fill in the exact pixel in the column where the field should be placed.
- * Dis. format (W) Here you can fill in the exact display width of the field.
- * (H) Here you can fill in the exact display height of the field.



- * Input format (L) Here you can specify the maximum input length.
- * (D/N) Here you can specify the number of decimals that can be used for the value.
Note: for decimal fields, the maximum input length includes the decimalpoint!! and the negative sign!! So a 5.2 field can have a maximum value of 99.99 and a minimum of -9.99.
- * Start function This function will be performed when the input field is activated.
- * End function This function will be performed when the input on this field has been concluded.
- * Cancel function This function will be carried out if the start function or the end function were not performed properly.
- * List name Here you can specify a list which you want to use in this field
- * Minimum Value Sets a minimum value for this field.
If the field is filled in with a number smaller than specified, a message will appear: "Attention <field>: < <minimum value>".
- * Maximum Value Sets a maximum value for this field.
If the field is filled in with a number larger than specified, a message will appear: "Attention <field>: > <minimum value>".
- * Standard Value You can specify a standard value to prefill this field with the specified standard on creating a new record and double clicking on the input field when it is still empty.

Below these options you will find a block where you can change the font and the style of the text in the field.

- * Font Here you can specify the font size From 1= Small font up till 8= Giga font for this field.
- * Reverse Video With this option checked the background will be black and the text will be white.
- * Bold The text will use a bold font

On the right side of the screen, there is a list of all the field types.

- * T = Display text
- * D = Display data
- * A = Text input field
- * N = Numeric input field
- * M = Memo/multiline field
- * S = Stack field / Selection list
- * C = Calculated field
- * L = Logical field (tag-field)
- * B = Button field (Standard/menu button)
- * B1 = Button field (Action button)
- * I = Icon field (Standard button with icon)
- * I1 = Icon field (Action button with icon)
- * F = Frame (boundary / line / inverse block)
- * P = Picture (BMP file)

The type that is dotted is the fieldtype of your choice. By clicking another fieldtype you change the nature of the field.

The block below the fieldtypes is the block where you can add special functionalities to specific fields. (The specifications are not universal for all the field types. The fields where the specifications can be used are mentioned per specification.)

- * Obligatory : specify Obligatory to be sure this field will have an input. If the field is not filled in, a message will appear: "Attention <field> Obl. field is empty!!!", the cursor will now automatically go to this field and the handheld user first has to fill in this field before he can continue to the next record. Obligatory fields can be recognized by their red text color. (N, A, S, M)
- * ABC Uppercase: This means that all input will automatically be converted to capitals (uppercase). (A,N)
- * List-only : This will make sure that only input from the list will be accepted into the field. If something else is entered by the handheld user a message will appear:

- "Attention [xxxx] not in list" the user cannot continue until he selects an item from the list. (A,N)
- * Numbers-only : This is a specification to ensure that only numbers and no text can be entered into an A-field. This is often used with barcodes. (A)
 - * Date/time-stamp: This will make sure that the field will be stamped with date and or time. Normally the date will be entered as MM-DD-YYYY (month-day-year). To change the normal settings for date stamping you can use SAVETOREG DATEFORMAT <formatting>, in which formatting is the format used for the date e.g. DD.MM.YYYY, YYYY/MM/DD etc. (A)
 - * Copy-mode : This means that the last (pre)filled input of this field will be copied automatically to the next new record. (N,A)
 - * Inc-mode: The Inc-mode is a copy mode that copies the actual value of the field to a new record and increases the number with one (+1). (N)
 - * Hide field: This field will not be shown on the form (N,A,C,M,S,L,B,I)
 - * Stack field: Several values in one field. (S)
 - * Unique : You can specify Unique to be sure this field will have a unique input. If the input is not unique and already has been added to the data set a message will appear on the handheld screen: "Attention <field> [xxxx] is not unique". The handheld user can not continue until he has changed the value of this field to a unique value. This option can be useful for things like Id numbers. (N,A)
 - * Read-only: With this option a data field can be filled in once. After that it cannot be changed anymore, if it was already prefilled with data from a dataset it cannot be changed anymore. (N,A,M,L)
 - * Fixed: This option lets you decide how the numbers will be placed in the cell. Align right, align left, (A)
 - * Page-mode: This is useful if you use more screens. When you specify page-mode for a specific field, then this field will be shown on every screen. Note: position all of your Page-mode fields at the top of the screen, this will permit normal scrolling through the fields on the screen. (ALL)
 - * Q-mode: With this mode selected the value will be displayed as ****, for example if you fill in the word 'password' this will be displayed as *****. Q-Mode only works in form-mode and not in spreadsheet-mode. (N,A,M)

5 List file

In the previous chapters the term list was mentioned. This is how to create a list.

Choose Files from the menu on the form designer screen. Here you choose New list file. In the screen that pops up you can enter the items you want to place in the list. If you press OK the new list file will be saved in the project folder you are working in with the extension LST. (The list file has to be available in the project folder.)

5.1 Coded list

It is also possible to use a coded lists. To make a coded list, you have to change the input length (L) to 1, 2 or 3 etc. In this way only the first, first two or first three etc. numbers/letters will be displayed. After this code you can use a description that will not be stored in your database.

5.2 List width

Any list can be made wider on the screen of the handheld by entering "ctrl + l", this makes the width of the list as wide as your screen In the same way the list can be made smaller on the screen by entering "ctrl + s", this reduces the size of the list to it's original size.