



## **2L FIELD DEVELOPER v 11.X**

### **QUICK START**

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## Introduction

This quickstart manual is written to explain the possibilities of **2L** (tool) and to give you background information about developing forms and sheets using **2L**.

The software package **2L** consists of several modules. A development module called **2L Field Developer**, a field module called **2L Field** and a communication module called **2L Connect**. With these 3 modules you can design, develop, change, test and deploy a working system for digital registration on location.

**2L Field Developer** is a Windows based Rapid Application Developer tool, with which you can design, develop, test and deploy systems for digital registration on location in a very structured way, without knowledge of programming and independent from the mobile hardware. The package is available in different versions, The full version (**2L Professional**), the evaluation version (**2L Evaluation**) and the designer version (**2L Designer**). With the full version and the evaluation programs you can build forms and spreadsheets. The difference is that the applications you've built with **2L Evaluation** will not save any data during data collection.

**2L Designer** can be used to quickly generate forms without any data functionality.

Forms created with **2L Designer** can be integrated in applications using the full version **2L Professional**.

Before you start making your own form or spreadsheet, we recommend you first read the basics as specified in chapter 1.



The **2Lbar** is a helpful tool to quickly and easily design your form. On the **2Lbar** you will find icons which represent the different basic elements you can add to your form. (See fig. 1, top left) The use of the 2L bar is very simple. Just click on the icon which stands for the element you want to add. Then click on the area on your painting screen. The different elements will be discussed in chapter 2.

**2L Field Developer** also has a sheet design module. This is not visible at startup. You can activate it from the main menu (Sheet – Sheet design). Designing sheets will be discussed in a chapter 5.

If you want to create a new form, select “File” and the option “New form” from the main menu. A 'create new form' dialog screen appears. Here you can name your form and save it in a Project folder.

When you want to open this form again later on, choose “File” and the option “Open” from the main menu.

## 2 Basic elements in a form

Before you start developing a form in a new project you must match the form size to the size of your mobile computer. You will find this on the main menu under “Options”, “Form size”. Here you can select the preferred screen size. The default used is 1/4 VGA Portrait, which is the standard screen for most PDA's.

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 dataset 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 relation with a dataset.

3. The action elements: Button and Icon

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

### 2.1 The passive elements

#### 2.1.1 Text (T-field)

You can use text in a form to give a title to the screen or to give additional information to an input field. The input field will be discussed later in this chapter.

To add text to your form click with you right mouse button on the painting screen. Then select the option “New text (T)” from the menu. The “Add new text” screen will appear where you can fill in the text you want to be displayed.

You can also use the **2L bar**. Click the “text”-button (the mouse-pointer will now be changed to the “text”-pointer) and click on the right position on the painting screen.

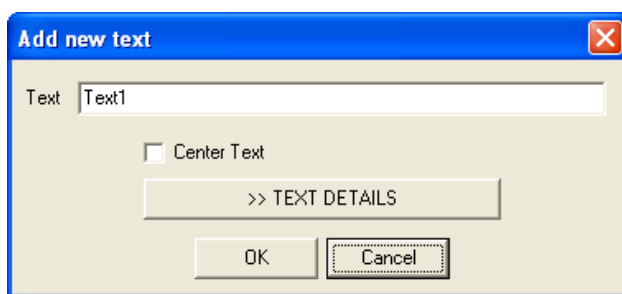


Fig. 2 : Add new text

In the “Add new text” screen you can specify the following basic text-items:

Text	Enter the text to be displayed on the screen.
Center text	Check this box to center the text horizontally.

Press OK when you're done, or press the “>> TEXT DETAILS” button to specify more text characteristics. This will show the “Text definition” screen.

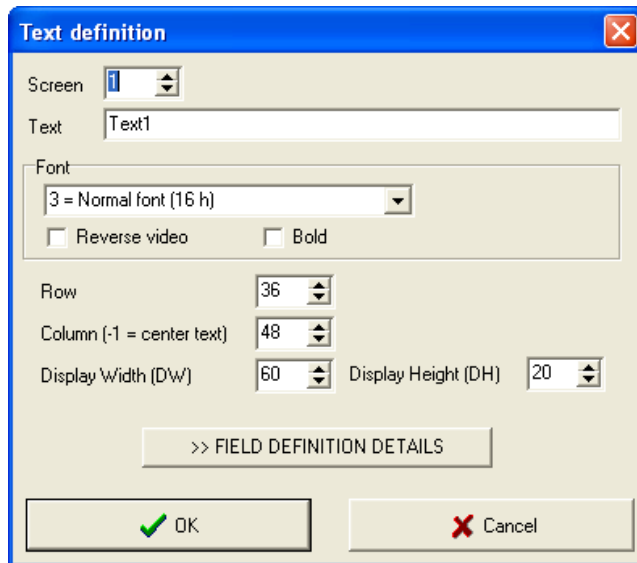


Fig 3. Text definition screen

With this screen you can specify

Screen	Select the screen-page number for this text element
Text	Enter the text to be displayed on the screen
Font	Select the font (size)
Reverse video	Use the text in reverse video (black on white)
Bold	Display the text in bold font
Row	Specify the row (top) position (in pixel)
Column	Specify the column (left) position. (use -1 to center the text horizontally)
Display Width	Specify the display width to be used
Display Height	Specify the display height to be used

Press OK when you're done, or press ">> FIELD DEFINITION DETAILS" (see chapter 3).

You can change any of these characteristics at any time later on.

To reposition the element: select the element in the painting screen, hold down the left mouse button and move the mouse. Release the mouse button at the new position.

To resize the element: select the element in the painting screen. Move the mouse over one of the resizing squares (the mouse pointer will indicate its resizing action), hold down the left mouse button, move the mouse to the new size/position you want, and release the mouse button.

With the "undo" function (menu Edit, Undo last, or Ctrl-Z) you can undo a reposition/resize action you do not like.

### 2.1.2 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:

Width	Specify the display width (pixels) of the frame.
Height	Specify the display height (pixels) of the frame
Reverse video	With this option checked the background will be black.
Text (optional)	Text to be shown at the top of the frame

### 2.1.3 Picture (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 can 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 non-bitmap pictures use the RUN <picture> command.

## 2.2 Data-elements

A data-element in **2L** is a field where information can be displayed and/or changed. If a data-element refers to a column in a dataset, the actual information displayed on the form is taken from the present record in the dataset. Changes made by the user in the form, will automatically be applied to the dataset. The different types of data-elements will be discussed in this paragraph.

### 2.2.1 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, the “Add Text Input field (A)” screen will pop-up (fig 4).

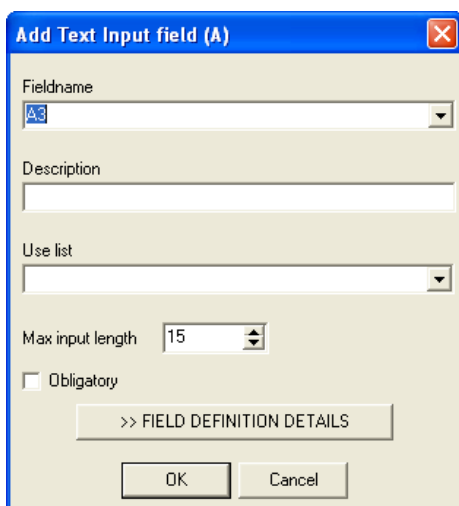


Fig. 4: Add Text Input field (A)

Using this screen you can specify the basic settings for this input field:

Fieldname	This name will appear in the form painting screen and can be used as a
-----------	--

	reference access this field in commands.
Description	This description is shown at the top of the handheld screen when this field has the input focus. When the description is empty, the fieldname will be shown as description.
Use list	here you can specify a list for the A-field (This list has to be available in the project). (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.
Obligatory	if you select this option, you mark this field as mandatory: if this field is left empty during data collection, a message will appear: "Attention <field> Obl. field is empty!!!", and the handheld user first has to fill in this field before he can continue to the next record.

A-fields without a list will be shown as blue fields on the painting screen. Obligatory fields will be shown with a red text color. If you specified a list to be used with this input-field, the field will have a pull-down icon, and a green background color.

Note: these colors will help you to specify the different kinds of fields during the development process. On the handheld, these colors will not be used.

## 2.2.2 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 the "Add Numeric Input field (N)" screen will pop-up.

Fig 5. Add Numeric Input field (N)

Using this screen you can define:

Fieldname	This name will appear in the form painting screen and can be used as a reference access this field in commands.
Description	This description is shown at the top of the handheld screen when this field has the input focus. When the description is empty, the fieldname will be shown as

Fieldname	This name will appear in the form painting screen and can be used as a reference access this field in commands.
	description.
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.
Number of decimals	This number can vary from 0 up to 5. Note the maximum input length must include the maximum number of decimals, the decimal sign and a negative sign.
Minimum value	The value of the number entered will be compared to the minimum value. When this value is lower than the minimum value a warning message will appear and the handheld user must confirm, that the value entered is correct.
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.
Standard value	The standard value will be used to prefill this field for each new record.
Obligatory	if you select this option, you mark this field as mandatory: if this field is left empty during data collection, a message will appear: "Attention <field> Obl. field is empty!!!", and the handheld user first has to fill in this field before he can continue to the next record.

Numeric input fields can also have a list to select from (specify using ">> FIELD DEFINITION DETAILS").

Numeric input fields will be shown as yellow elements with a border.

### 2.2.3 Logical input field (Check-box) (L-field)

A logical field is displayed on the handheld screen as a check-box Clicking on the field changes the status from tagged/checked (logical 1) to untagged/unchecked (logical 0) and so on.

When you add a new L-field the "Add Logical field (L)" screen will pop-up.

Fig 6. Add Logical field (L)

Here 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 when checked	What to display when the check-box was checked
Description when unchecked	What to display when the check-box 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.

If you do not want to show different texts for checked/unchecked, you can leave the unchecked description empty.

Logical fields will be shown as blue elements with a check-box at the left side of the element.

## 2.2.4 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, the "Add Memo Input field (M)" screen will pop up.

Fig 7: Add Memo Input field (M)

Here 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 is shown at the top of the handheld screen when this field has

	the input focus. When the description is empty, the fieldname will be shown as description.
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.
Max. # lines	the maximum number of lines that can be used in the memo field
Obligatory	if you select this option, you mark this field as mandatory: if this field is left empty during data collection, a message will appear: "Attention <field> Obl. field is empty!!!", and the handheld user first has to fill in this field before he can continue to the next record.

Memo fields are shown as blue elements with a black border, it will initially be re-sized to the amount of lines you've specified for the M field.

Note: a memo field cannot have a list attached to it.

### 2.2.5 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 list-boxes

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 at the top of the handheld screen.

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 analysis.

### 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 color. A special selection list is the Stack-field (see above).

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 is shown at the top of the handheld screen when this field has the input focus. When the description is empty, the fieldname will be shown as description.
Use list:	You can specify the list you want to use. Note: the list has to be available in the project folder. (See chapter 5)

### 2.2.7 Display data field (D-field)

A D-field is a non-editable 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) non-editable 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.

## 2.2.8 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 color 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.
Calculation:	Arithmetic formula or statistical function (see table below)
Max. display length	Maximum length for the calculated result
Hide	Check this box to hide the field, useful for intermediate calculations

### 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 &(amp;concatenate)
	Value/Field2:	Fill in a standard value or the name of a field used in the same form
Statistical function	Function:	Choose the function you want to use
	Statistical Field:	refers to a S(stack)-field

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 either be 0 or a wrong number. 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 accurately the calculation can be.

### 2.2.8.1 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.

### 2.2.8.2 Statistical functions

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

Function	Description
CNT	counts the number of measurements in the stack field
CUM	adds all the values of the measurements in the stack field
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.

## 2.3 Functional elements (Buttons and Icons)

All buttons and icons are non-editable elements, with a user interaction based on a start function. Icons can be seen as buttons with a picture instead of a button-text

### 2.3.1 Standard Button

A standard Button (B-field) can be defined anywhere on the screen, they have a characteristic gray color 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. When the description is empty, the Button name will be used.
Start function:	This function will be carried out when the button is pressed, double click this field to choose a command from the list of available commands.
End function:	This function will be carried out when the start function has been carried out, double click this field to choose a command from the list of available commands.
Cancel function:	This function will be carried out when the start and/or end function were not carried out properly, double click this field to choose a command from the list of available commands.
Action menu button:	Check this option to make this an action menu button (see 2.3.2).

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 (which could be a general 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 the screens of your form (just specify the Page mode option for these buttons).

### 2.3.2 Menu Button

A Menu button (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).

### 2.3.3 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 button is pressed, double click this field 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 this field 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 this field to choose a command from the list of valid commands.
Action menu icon-button:	Check this option to make this an action menu icon button (See 2.3.2).

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

### **2.3.4 Menu Icon**

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

### 3 Field Definition Details Screen

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 Field Definition Details screen will look like this:

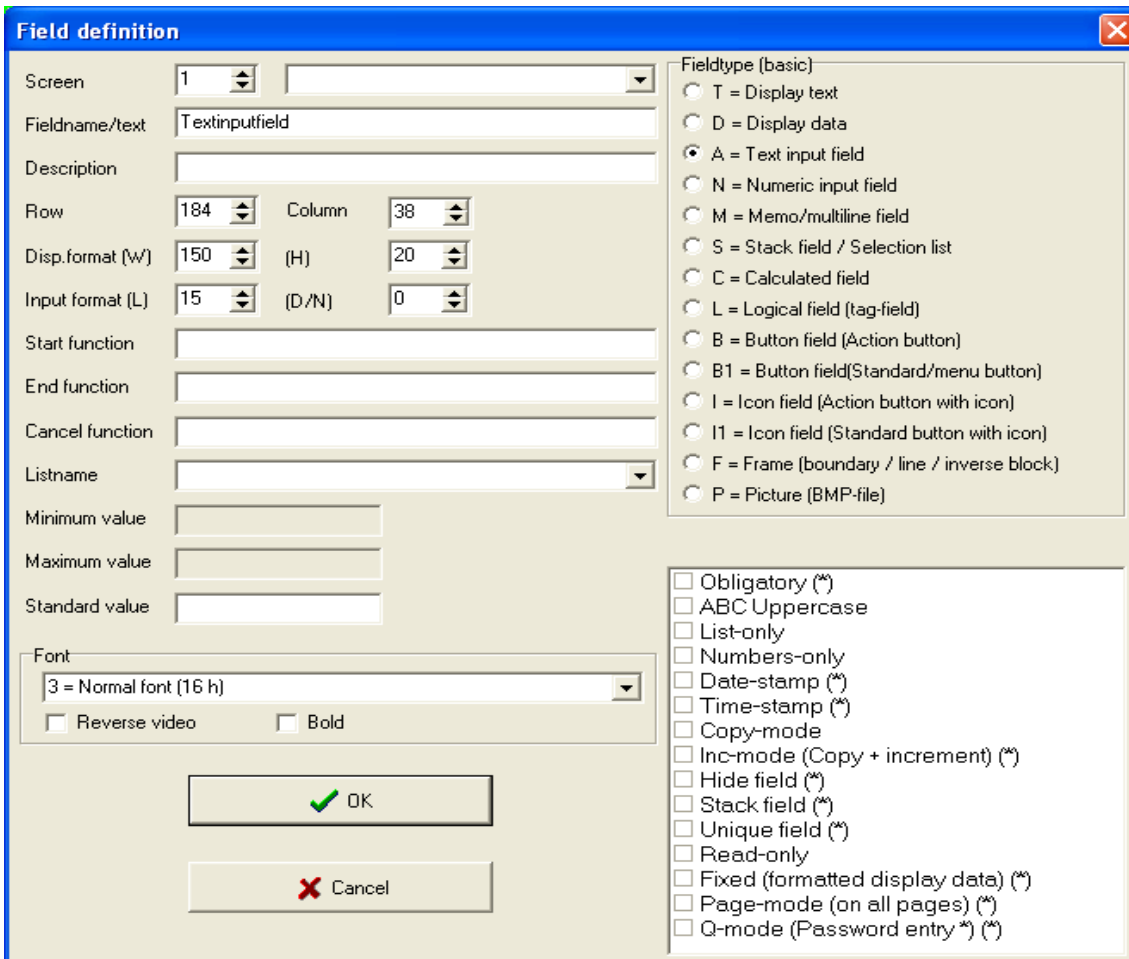


Fig. 9 Field definition details

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	The screen number on which this 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	The top position in pixels for this field
Column	The left position in pixels for this field
Disp. format (W)	The display width of the field in pixels.

(H)	The display height of the field in pixels.
Input format (L)	The maximum input length. Note: for decimal fields, the maximum input length includes the decimal point!! and the negative sign!! So a 5.2 field can have a maximum value of 99.99 and a minimum of -9.99.
(D/N)	The number of decimals for a Numeric input field. Or the maximum number of lines for a Memo field.
Start function	This function will be performed when the input field is activated, or the button is pressed.
End function	This function will be performed when the input on this field was finished, or when the Start function of a button was carried out successfully.
Cancel function	This function will be carried out if the start function or the end function failed.
List name	Specify the list to be used in this field
Minimum Value	Sets a minimum value for this field. If specified, a value less than this minimum must be confirmed .
Maximum Value	Sets a maximum value for this field. If specified, a value higher than this maximum must be confirmed .
Standard Value	Sets a standard value to prefill this field on creating a new record or 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/multi-line 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 field type of your choice. By clicking another field type you change the nature of the field.

The block below the field types 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!!!", 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)
Datestamp:	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)
Timestamp	The default format for time stamp is HH:MM:SS. You can change this by using SAVETOREG TIMEFORMAT <formatting>, in which <formatting> is your preferred time format, e.g. HH-MM-SS or HH.MM
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:	Stack more values in one field. (S) Values in a stack can be used for statistical analysis
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 when it is still empty. After that it cannot be changed anymore. If it was already prefilled with data from a dataset it cannot be changed at all. (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, not in spreadsheet-mode. (N,A,M)
--	--

## 4 Working with **2L Field Developer**

Some function that can be used in **2L Field Developer** have not been mentioned yet. They will be discussed here.

### 4.1 Copy fields

When you design a new form, which is (partly) identical to an existing form, you can copy one or more elements from the existing form and paste them into your new form.

Open **2L Field Developer** twice, first with the existing, and again with the new form.

To copy individual elements : select the element in the first designer, use the right mouse button, and select copy. Now select the location in the new form, press the right mouse button and select Paste.

To copy more than one element, you must first select the elements to copy: double-click the individual elements on the form designer screen. The selected elements will get a selection tag (V) in the first column. Now Select Edit, Copy Selection in the main menu. Activate the new form, and select Edit, Paste from the main menu.

### 4.2 Undo

Any changes you've made, can be undone, until you save or close the form you're working on.

To undo your last action, press Ctrl-Z or select Edit, Undo last from the main menu.

With the function "Edit, Undo from..." you can undo more than one action at the same time.

Note you can only undo the last action or actions.

### 4.3 Print functions

Within **2L Field Developer** there are three print functionalities, selectable under "Print" from the main menu.

#### 4.3.1 Print Active Screen

When you select this print function, the form designer screen will be printed.

#### 4.3.2 Print Form (**2L Professional**)

When you select this print function, a screen will be shown, where you can select the following option to be printed:

- Form info (The information you specified for this form)
- Field definition list (The complete list of all the elements in this form)
- Constraints list (A list of those fields having a constraint)
- Commands list (A list of the commands used in this form)
- Data list (A list of the data fields used in the data-file attached to this form)
- Screens (All the screens designed for this form)

#### 4.3.3 Print Setup

This option will bring up a printer setup screen, where you can select the printer and specific printer

related settings.

## 4.4 Edit mode

Any element in the form, can be edited by selecting the element, and using the “Edit” function from the menu.

But you can also change each individual item from each element in the form designer screen itself. To activate this functionality, you must enable “Edit mode”: select “Edit”, “Edit mode” from the main menu. With edit mode activated, each individual cell in the form designer screen can be changed using the keyboard. Changes you've made in “Edit mode” will not show immediately in the painting screen. To actually see the changes, select “Form”, “Update screens” from the main menu.

## 4.5 Testing a single form

You can test the form you are working on, by copying the form to your handheld and try it using 2L Field. But it is also possible to do the basic testing without first deploying the form on a handheld. For this an integrated test environment is build into the program. Select “Form”, “Test form” from the main menu. If the form was changed and not saved before testing, the program will prompt you to save the changes.

A 2L Field emulation screen will be shown. Now you can do the testing of your form.

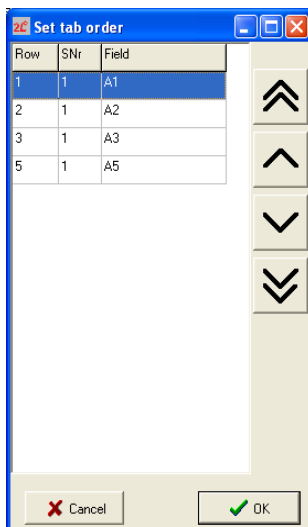
Anything not working as intended, can be changed and re-tested until you're satisfied with the results.

## 4.6 Changing the Tab-order

The input order of the input fields in your form ( the tab-order), is the order of the fields as defined and shown in the main screen. Sometimes this order is not the desired tab-order. **2L Field Developer** has a build-in tab-order editor, where you can change this tab order.

Select “Fields”, “Tab order input fields”, “Manual” from the main menu.

The “Set tab order” screen will pop up. Here you can select individual fields and use the arrow-buttons to move the fields and create a new tab-order.



## 4.7 Create lists

The possibility to use lists with input fields was mentioned before. You can easily create and edit these lists from within TFD.

To create a new list, select “Files”, “New List File” from the main menu.

A “NEW LIST” screen will pop up. Here you can enter the list-items. You can use Copy/Paste to get the list-items from some other document or dataset if you like.

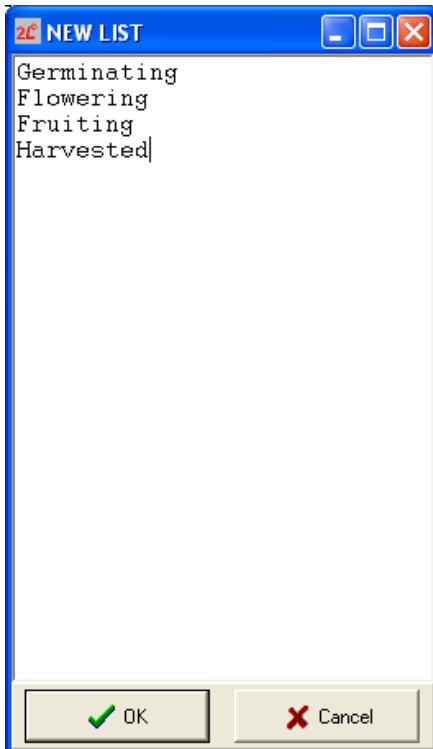


Fig. 11 New list

Each list item must be placed on a new line, the order of the lines entered in the list will also be the order of the lines shown during data entry.

To save the list, press OK and fill in a proper name (the program will automatically enter the LST extension if you don't supply any extension yourself).

Note the list file must be saved in the same directory where your form is saved, otherwise the list cannot be found (during testing or data entry).

### 4.7.1 Connect a list to an input field

To use this list with an input field, you have to make a connection and supply the name of the list file to the list property of the input field.

Select the intended field, and edit this field. Fill in the correct list-file name, or select the proper one from the pull down list. Press OK in the “Field definition Details” screen. The input field will now be shown with a pull-down icon at the right side of the field.

## 4.8 Check design

The “Check design” functionality can assist you in discovering any anomalies in your design. These anomalies can be

fields too small to contain the maximum amount of characters  
fields (partly) designed outside the screen boundaries  
fields with the same name specified on different locations in your form, and having different field types (A on screen 1 and N on screen 2)  
fields defined in the form but not related in the dataset  
fields defined in the dataset but not used in the form

Select "Form", "Check design" from the main menu. This will show a complete list of the possible problems to be expected.

It is up to you to accept this or change the unwanted items.

## **4.9 Form settings**

Each individual form is given a specific set of form definitions called the form settings.

Select "Form" - "Form settings" from the main menu. The individual definition settings for the form are:

Edit data allowed	This option is normally turned on. If turned on, data collection (changing data in input fields) is enabled in this form. If turned off, you can only view the available data, but you cannot change them: the dataset is read-only.
Append records allowed	This option is normally turned on. If turned on, you can add new records to the dataset. If turned off (or "Edit data" is NOT allowed!!), you cannot add new records, you can only view/edit the records already present in the dataset.
Continuous data entry	This option is normally turned on. If turned on, you will automatically continue the data collection process in the first input field on the next record, as soon as you've entered the last input field in the present record. If the present record is the last record in the dataset, and "Append records" is allowed, then a new record will automatically be added with continuous data entry. If turned off, entering data in the last input field in your form, will not show the next record. The cursor will stay in this last input field of the present record.
Select other forms allowed	This option is only applicable to older DOS-based systems. It does not influence the data-collection specifications of the form.
Menubar visible	This option is normally turned on. If turned on, a menu bar will be placed at the top of the form. This menu bar will have 4 sub-menus: File, Record, Screen and Extra. If turned off, no menu will be added to the form. Only a small exit button will be placed in the top right corner. Any other standard functionality (Save and Exit, Add record, Scroll functions etc..) have to be supplied through user buttons on the form.
Auto input mode	Normally this option is off. If turned on, entering data in an input field up to the maximum input length will automatically execute the end function of the input field and continues

with the next input field.

If turned off, the input focus will not be shifted automatically to the next input field. The user must press the Enter-key or click the next input field himself.

Listcaption

This option is only applicable to older DOS-based systems. It does not influence the data-collection specifications of the form.

Logfile

Here you can specify a file name to be used for logging during the data collection with this form.

If this log-file is empty, no specific logging is executed for this form.

If a logfile name is supplied, any changes during the data collection process will be logged (on record basis) with date and time stamp.

Datafile

Here you can specify the name of a specific dataset to be used with this form.

If you don't specify a dataset, the data collection will be done using a dataset based on the form name, or supplied to the form as formname parameter.

If you supply X as dataset, this will be considered as "do not use a dataset and do not save any data filled in this form".

If you supply wildcards (\* or ?) in the name of the dataset (like A\*.DAT), you have the possibility to select a dataset from a list of datasets matching the file name specification. The dataset selected by the user will now be used with this form.

Filterfile

Here you can specify the name of a file containing one or more filter specifications to be applied on the selected dataset.

When a filter file is specified, only those records matching at least one of the filter conditions will be shown and can be edited. The other records cannot be accessed as long as the filter is active.

Taskbar

Normally the taskbar-selection option is "Not visible/not existing".

Most Pocket PC/ Windows mobile handhelds have a persistent task-bar at the top of the screen. Forms designed specifically for these handhelds, should be given a "Top of screen" taskbar. The painting screen will decrease its paintable area at the top of the screen.

If you design forms specifically for Windows CE handhelds, you should select the "Bottom" taskbar. The remaining painting area is more according to the actual screen area on the handheld.

On-screen keyboard

If your mobile computer does not have a physical keyboard, you can supply a software keyboard to the form. This software keyboard contains a numeric keypad, backspace, delete and Enter keys. If you need to enter texts, you can always use the handhelds integrated pop-up keyboard.

Auto save data:

Normally this option is turned on.

If turned on, any change in a record will automatically save the complete dataset. This saving will take place on switching to another record in the dataset.

If turned off, the actual saving of the data will only be done on closing the form (or specifying the command SAVEDATASET).

If you have a slow memory card and/or a very large dataset, and "Auto save data" set to on, this could decrease the speed of the data collection process. In that case it could be useful to set "Auto save data" to off, and use logging instead.

#### **4.10 Form description**

In the form description you can specify purpose, creation date, version and other from specific information.

The Form description can be show to the handheld user.

#### **4.11 Table view record layout**

With this utility you can create your own record layout, from which the handheld user can select a record for data collection

#### **4.12 Multiple pages in one form**

When you design a form with many input fields, you can try to put all the elements on a screen. Sometimes this means the screen gets very crowded, or the fields and buttons need to be set to very small fonts. In that case, you can distribute the elements over multiple screens or pages (starting from page 1 to page 10). To add a screen to your form, select "Form", "Show new screen" from the main menu.

When using forms with multiple screens on the handheld, data collecting will automatically jump from one page to the next page, when you've entered the last input field on the actual page.

Page scrolling functions (attached to buttons in your form, or selected from the form's menu) will allow the handheld user to access the individual pages of the form.

#### **4.13 Rearrange fields and screens**

This utility will help you to redesign a screen when you want to implement it for a different screen size.

Depending on the selected items, individual fields can easily be moved or re-sized to better fit the new screen size.

## 5 Sheet designer

The sheetdesigner screen will show you how the form will look like when opened in spreadsheet mode.

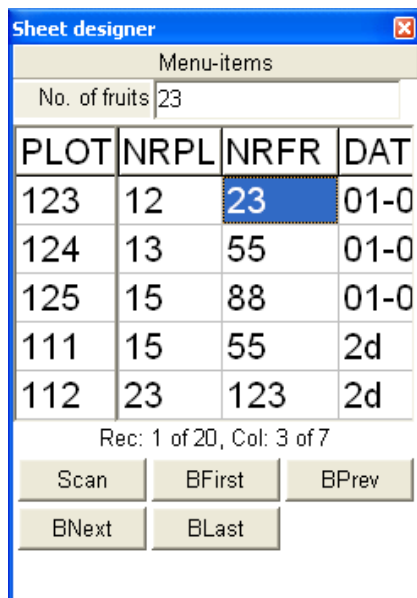
At the top the menu-bar (if this was turned on) will be shown.

Just below the actual input line, where the contents of the selected cell in the spreadsheet is displayed and can be edited (if allowed).

Next the spreadsheet with the columns and rows will be displayed, with an information line just below. The header row of the spreadsheet contains the column names.

The bottom part of the screen is reserved for keyboard and user buttons, with a small k/b button to switch between keyboard and button display.

Only the data element specified in the form definition will be shown as columns in the spreadsheet. The buttons and icons which can be freely designed in the painting screen, will be ordered in a block at the bottom of the sheet designer screen.



Menu-items			
No. of fruits 23			
PLOT	NRPL	NRFR	DAT
123	12	23	01-0
124	13	55	01-0
125	15	88	01-0
111	15	55	2d
112	23	123	2d

Rec: 1 of 20, Col: 3 of 7

Scan	BFirst	BPrev
BNext	BLast	

Fig. 12 Sheet designer

### 5.1 The Menu-items

The menu-items will only be displayed when this option in the form settings is turned on. Both in forms mode and in spreadsheet mode the menu can have up to 4 sub menus.

#### 5.1.1 The File submenu

The items in the File submenu depend on the form settings for "Edit data allowed" and "Append records allowed". If one of these was turned off, only 2 submenu items are available: Ready and Cancel.

If both are turned on, then 3 more submenu items are present: New record, Add record and delete record.

Ready	Check the actual record. If no errors were found, save any changes to this record, save the dataset and close the form.
Cancel	If the actual record was not changed, just close the form (save the dataset if the other records were changed and had not been saved yet). If the actual form was changed, the user has to confirm to close the form without saving the changes in the actual record.
New record	Add a new record to the dataset, prefill with default and copy values and show this record.
Add record	Copy the contents of the actual record into a new record and add it to the dataset, then show this new record
Delete record	The user has to confirm deleting the actual record. After deleting the next record will be shown. If the deleted record was the last record, the previous record will be shown. If the deleted record was the only record in the dataset, a new record will be shown.

### 5.1.2 The Record submenu

The items in the Record submenu depend upon the actual number of records in the dataset.

If no dataset is present, the submenu does not show at all.

If only 1 or 2 records are present, the submenu only shows the menu items First, Last, Show info and Hide info.

With more than 2 records, the submenu also shows Prev, Next, Goto Rec and Search.

First rec.	Select and show the first record in the (filtered) dataset
Prev rec.	Select and show the previous record in the (filtered) dataset
Goto rec #..	The user will be asked to enter a record number to be selected and shown.
Next rec.	Select and show the next record in the (filtered) dataset
Last rec.	Select and show the last record in the (filtered) dataset
Search	The user will be asked to enter a search string for the actual field. The (filtered) dataset will be searched for the <b>next</b> (filtered) record where the actual field matches the search string.
Show info	Display a list of field names and values for the actual record
Hide info	Hide the info list again.

Before switching to the other record, the present record will be checked. If it contains input errors, the error will be displayed, and the present record will be reactivated.

### 5.1.3 The Page/Cols submenu

If Forms mode a Page submenu is available if the form consists of more than one screen.

With only two screens, the submenu contains two items: First page and Last page.

When more than 2 screens are present, 3 more items are available: Prev page, Next page and Goto page #..

First page	Select and show the first screen of the form.
Prev page	Select and show the previous screen of the form.
Goto page #..	The user will be asked to enter a screen number to be selected and shown.

First page	Select and show the first screen of the form.
Next page	Select and show the next screen of the form.
Last page	Select and show the last screen of the form.

When selecting a page with a higher page number than the actual page, the actual page will be checked for input errors (empty obligatory fields, minimum or maximum value errors). If the program finds an error, it does not select the new screen, but displays the error.

In spreadsheet mode a Cols submenu is available if the total width of the spreadsheet is larger than the screen width of the handheld.

First col	Select and show the first column of the sheet for the actual record.
Prev col	Select and show the previous column of the sheet for the actual record.
Goto col #..	The user will be asked to enter a column number to be selected and shown.
Next col	Select and show the next column of the sheet for the actual record.
Last col	Select and show the last column of the sheet for the actual record.

#### 5.1.4 The Extra submenu

If the form contains menu buttons (B1 elements) and or menu icons (I1 elements), all these menu buttons and icons will not only appear in the form or underneath the spreadsheet, but will also show up as the menu items in the Extra submenu.

### 5.2 Spreadsheet lay-out

You cannot change the basic layout of the spreadsheet, but you can influence the order of the columns, the number of rows and the width and number of the individual columns.

The order of the columns in the spreadsheet is defined by the order of the data-fields in the form definition. This can easily be changed using "Changing the tab-order".

The maximum number of rows shown in the spreadsheet depends on the spreadsheet font, for which the font of the first column will be used. A larger font will decrease the maximum number of visible rows, a smaller font will increase the number.

Since about half the screen height is used for the spreadsheet rows, a handheld or pen tablet with a larger screen can show more rows.

Each individual column can be given a specific display width. In the sheet designer you can easily change the individual widths. With smaller columns and a wider screen more columns will be visible in the row.

There is a minimum column width for visible columns (20 pixels, to show at least 2 characters).

The maximum column width in a spreadsheet is a few pixels less than half the screen width. The spreadsheet can always show at least 2 columns.

In spreadsheet mode you can use buttons. The buttons you've already specified in the form, will be placed underneath the spreadsheet-part. You can add, delete, edit individual buttons, by selecting the button in the spreadsheet screen, and use the right mouse button. You can add new buttons by pressing the right mouse button on an empty part of the screen next to the buttons.

A new button will be placed next to the existing buttons. You can change the order of the buttons, by selecting the button to be moved, press the right mouse button, and select "Move up" or "Move down" from the pop-up menu.

### **5.3 Sheetdesigner pop-up menus**

When you select a column with the mouse, and press the right mouse button a column pop-up menu will appear.

This menu will enable you to

Edit column : change the selected columns specifications

Add column : add ea new column at the end of the columns list

Insert column : insert a column just before the selected column

Delete column : remove the selected column (the program will ask for confirmation)

Smaller font : decrease the font size of the first column. The whole sheet will be redisplayed in a smaller size

Larger font : increase the font size of the first column. The whole sheet will be redisplayed in a smaller size

Hide column : make the selected column hidden

Show column : unhide the selected column

When you press the right mouse button in the screen area outside the spreadsheet area, a pop-up menu appears with options: Add column and Add Button.

>When you press the right mouse button on a spreadsheet button a button pup-up menu will appear.

From this menu you can select

You should now be able to create your own forms using **2L Field Developer**.  
We advise you to read the other documents to increase your knowledge of the programs, and improve the quality, reliability and efficiency of your field force.

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