Mark*master*™ User Guide
for
3000 Series Dot Peen Machines

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SECTION 1
ABOUT THIS MANUAL

Introduction

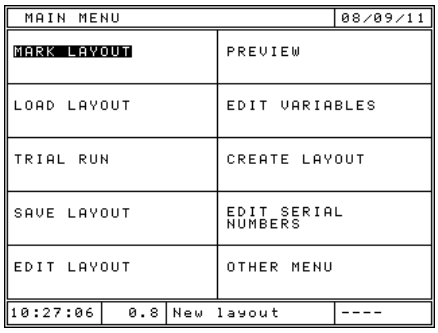
This manual is a software reference for the features of the Pryor Markmaster software when operated with dot peen marking machines controlled using the Marktronic 3000 series controller.

For specific details about the machine itself please refer to the user guide supplied with the machine.

The 3000 series controller (pictured below) is capable of controlling many different models of dot peen machine in a variety of control modes.

Normally the controller is configured to 'Embedded LCD mode'. In this mode the marking layouts are created using the controllers LCD screen and membrane keyboard via a series of on-screen menus. Full details of this mode are covered in the user guide supplied with the machine.

3000 Controller

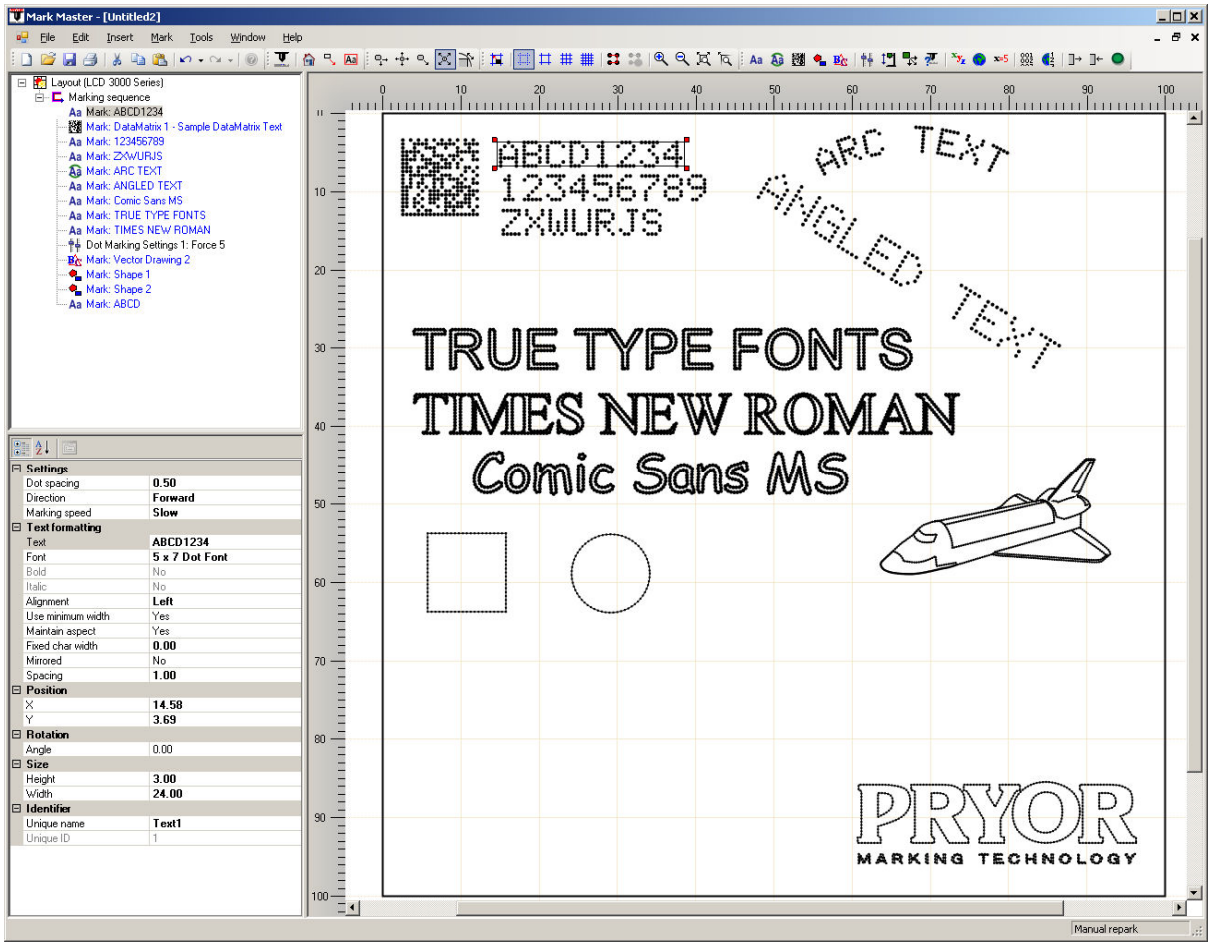


'Embedded LCD' Menu Screen

This manual is for the Mark*master* Windows software which may be used as an alternative method for controlling the dot peen machine. When using Markmaster, the 3000 controller is still used but all user interface control is performed via the PC software. When using Markmaster the controller needs to be configured to 'Windows Interface'. See the getting started section to learn how to switch the controller in to 'Windows Interface' mode.

The 3000 controller connects to the PC via an RS232 connection, using a null modem serial cable.

The MarkMaster™ software is primarily used to create marking layouts such as text and graphics. These can then be dot peen marked directly on parts by clicking the Mark button in the software.



The Markmaster software has a configurable marking area to suit the machine it is connected to, allowing a wide range of marks to made, including straight text, angled text, arc text, various high speed matrix fonts as well as Windows True Type font support for decorative, high quality marks. The software can automatically generate serial numbers, time / date marks as well as interface directly to database systems.

The MarkMaster™ software includes but is not restricted to the following list of features.

- Full graphical user interface
- Angle and Arc Text Marking (5x7, 7x9 and Varidot Fonts)
- Time / Date, Shift Coding and Serial Number Marking
- Variable data input features
- Advanced Trial Run with cursor jog features
- Marking Depth control
- Dot Spacing Control
- HPGL / DXF logo marking
- Shape tools for marking
- True Type Font marking
- Database connectivity tools
- Layout Offsets
- Advanced Serial Number features
- Programmable Z Axis control (where fitted)
- Circumferential Marking control (where circumferential axis is fitted)

SECTION 2
GETTING STARTED

PC Minimum Requirements

Please ensure the selected PC meets these minimum requirements.

Windows 2000/XP or Vista
Spare RS232 Serial Port
1GHz Processor
512Mb RAM
60Mb available HD

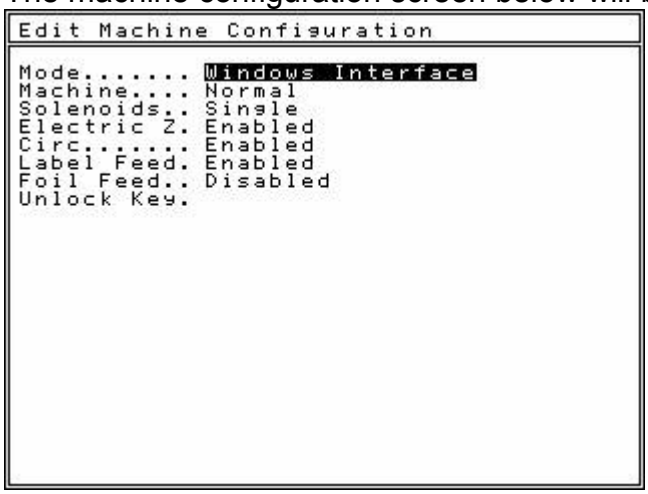
Configuring the 3000 Controller

The 3000 controller needs to be running in 'Windows Interface' mode when working with Markmaster. If your controller screen looks similar to the screen below (i.e Windows PC Interface screen title), skip this section and move on to 'Setting up the PC'.

To switch the controller to Windows PC interface follow the steps below.

1. Switch off the controller and switch it back on holding down the F9 key.
2. When prompted to enter a password enter "PRIORITY UPGRADE" and press Enter.

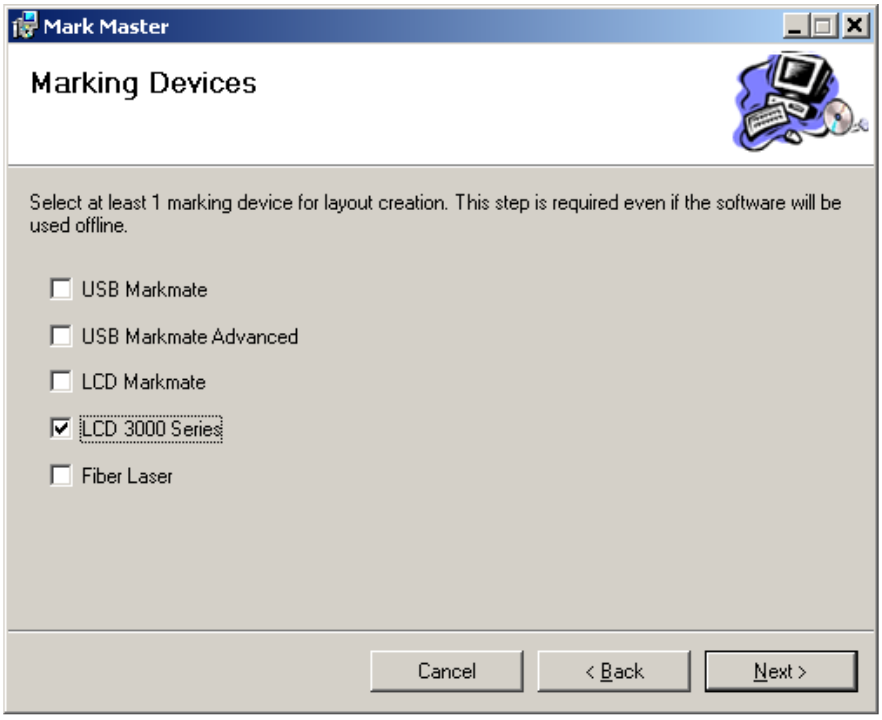
3. The machine configuration screen below will be displayed.



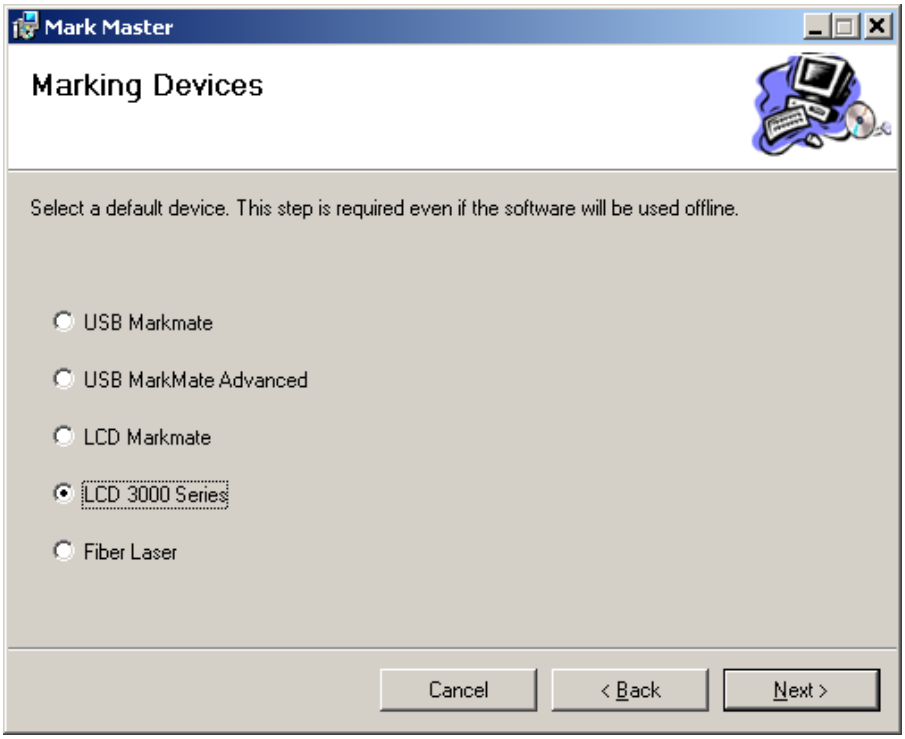
4. Change the Mode to Windows Interface using the left and right cursor keys, then press ESC. The controller will re-boot into Windows Mode and display a screen similar to the photo in the previous page. You are now ready to set up the PC.

Setting up the PC

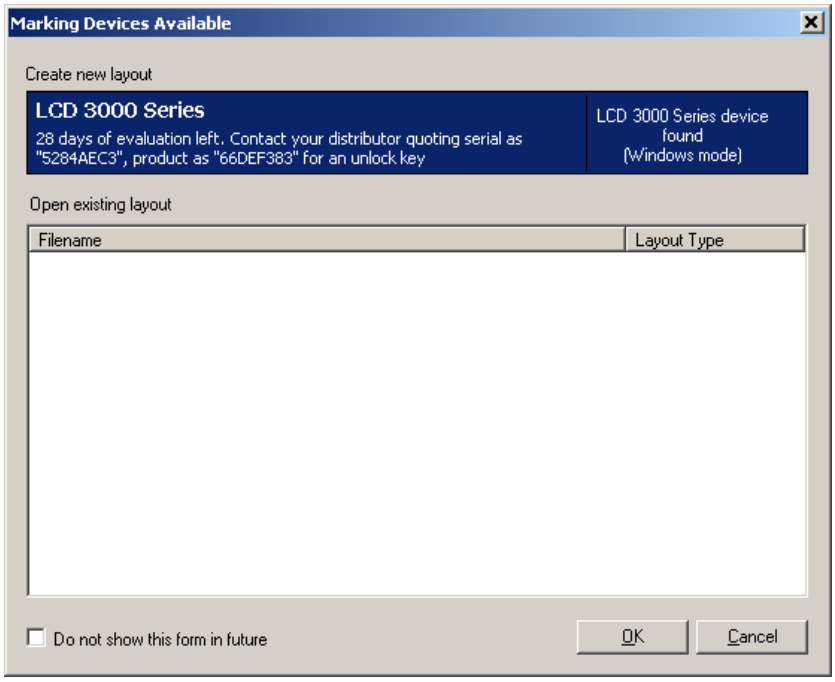
1. Insert the CD into the CD/DVD drive or your Windows 2000/XP/Vista PC. The installation should automatically begin. If not, browse to the CD drive in 'My Computer' and run the setup.exe file then follow the installation instructions. When asked to select the marking devices, select LCD 3000 series if your PC is connecting via RS232 to a 3000 style controller.



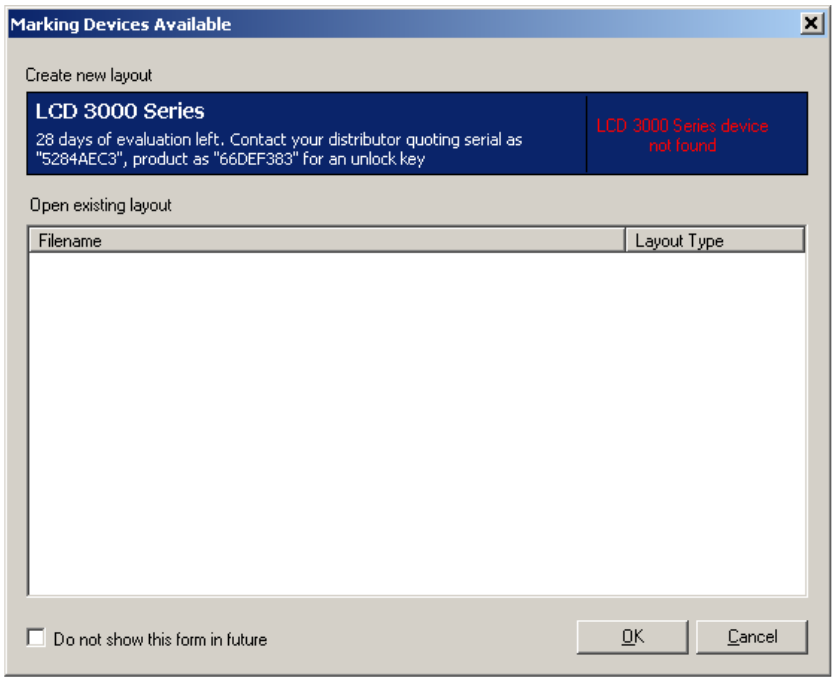
Then select LCD 3000 Series as the default device on the next screen.



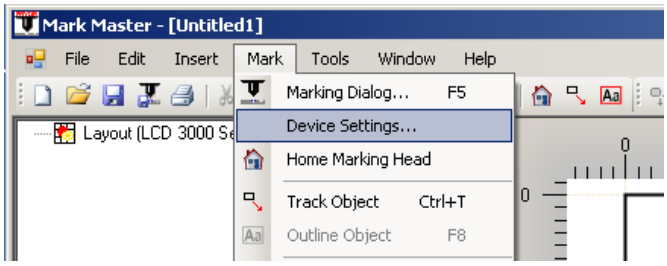
2. The MarkMaster software requires the Microsoft .Net Framework to be installed on the PC. If this is not installed the installation program will guide you though the process.
3. When the software installation is complete, connect the 3000 controller to the PC using the RS232 null modem cable supplied (Details at rear of manual). Connect to Port A on the controller and make a note of the Com port used on the PC. Normally it is Com1.
4. Now run the MarkMaster software from the Windows Programs Menu.
    a. Start->Programs->Pryor Marking Technology->MarkMaster
5. The MarkMaster opening screen displays the status of the machine connected.



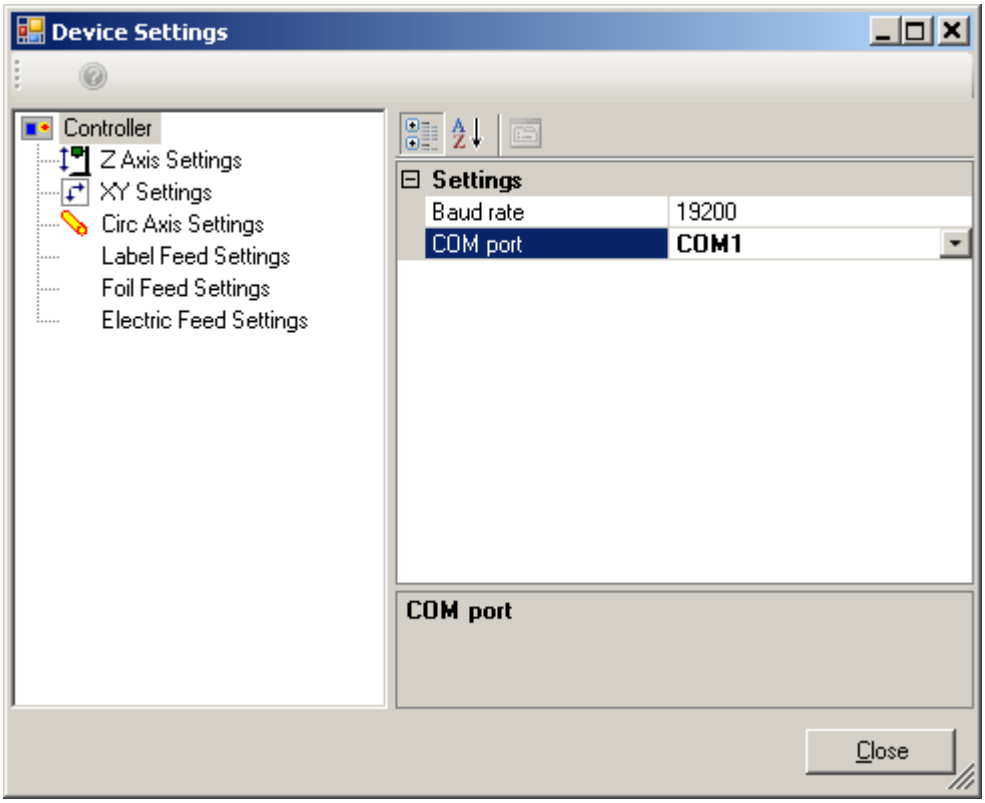
If the screen is as above. “LCD3000 Series device **found**”. Then the connection is working. Go to the next step.



If the screen is “LCD 3000 Series **not found**” then click OK and select Device Settings from the Mark menu.

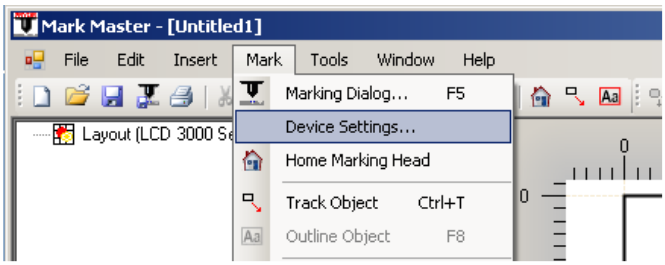


Select ‘Controller’ in the tree view and select the Com port on the PC which the 3000 controller is connected to. Ensure the Baud rate is set to 19200.

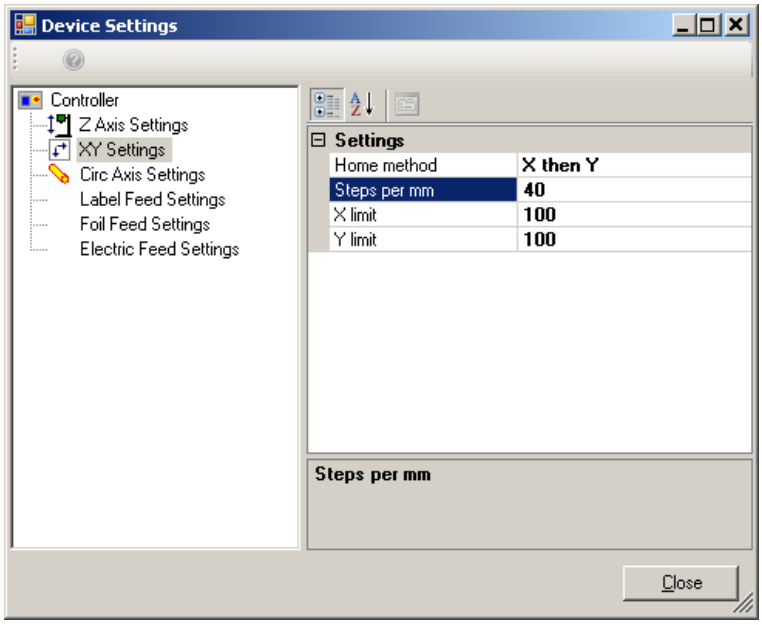


Click Close and restart the software. If Markmaster fails to find the controller this time. Please consult the trouble shooting guide for further information.

6. The software is now installed and ready to be configured for your actual machine. The main settings which need to be configured are the marking area of the machine and the steps per mm of the marking head. To do this select Device Settings from the Mark menu.



Select ‘XY Settings’ in the tree view as below.



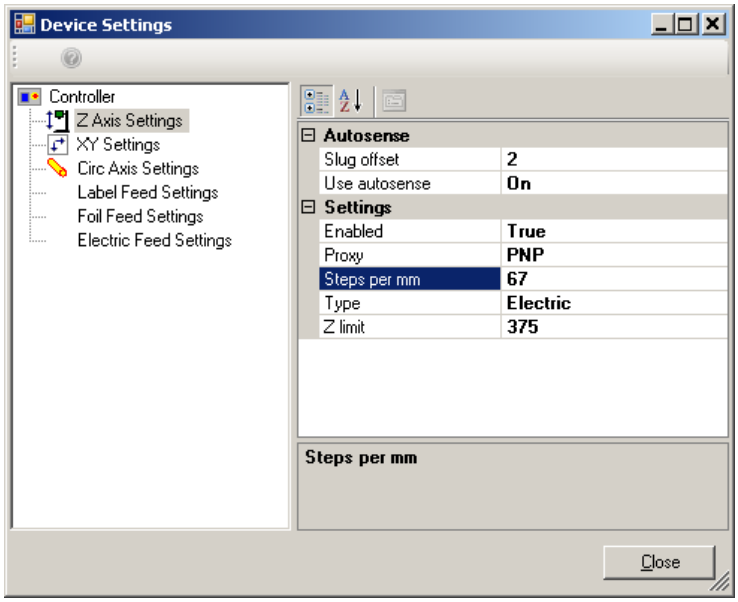
Enter the X and Y Limits of your marking head and also the steps per mm value. The table below will show you the settings for each model of machine.

Machine	X Limit	Y Limit	Steps per mm
Portable Machines			
PortaDot 50-25E (LD2)	50	25	29
PortaDot 130-30E	130	30	16
PortaDot 130-40E	130	40	13
PortaDot 100-75E (HD2)	100	75	33
Bench Top Machines			
BenchDot 60-60E	60	60	40
BenchDot 100-100E	100	100	40
BenchDot 150-150E	150	150	40
BenchDot 300-150E	300	150	40
Integrator Machines			
InDot 50-25E	50	25	29
InDot 60-60E	60	60	40
InDot 130-30E	130	30	16
InDot 130-40E	130	40	13
InDot 150-150E	150	150	40

7. If you have a 3000 series BenchDot machine with an electric Z axis then click on ‘Z Axis Settings’ and enter, otherwise skip to the next step.

Enabled = True
Proxy = PNP
Steps Per MM = 67
Type = Electric
Z Limit = 375mm

If your machine has an autosense module fitted you need to enable the Autosense here and enter your slug offset value. A good starting point is 2mm.



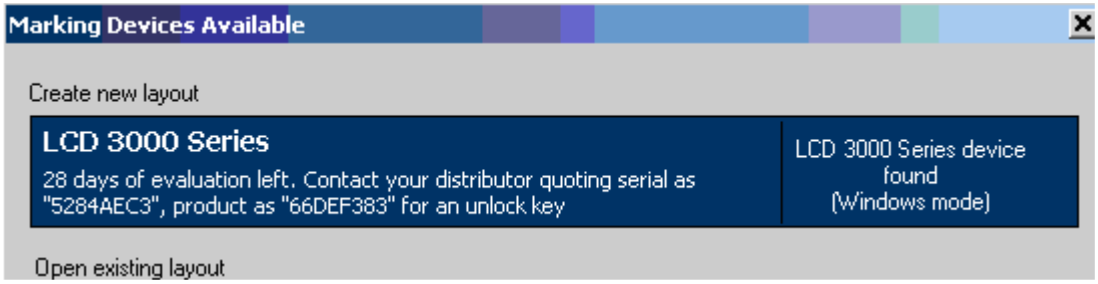
If you have a 2068 series machine your Steps per mm should be 133 and your Z limit is normally 240mm

8. Click Close and Restart the Markmaster software so the changes take effect. When the 'Marking Devices Available' screen is displayed, click ok. You now have a blank layout which should be the same size as your machines marking area. You are now ready to start creating and marking layouts.

Unlocking the Markmaster software on your PC

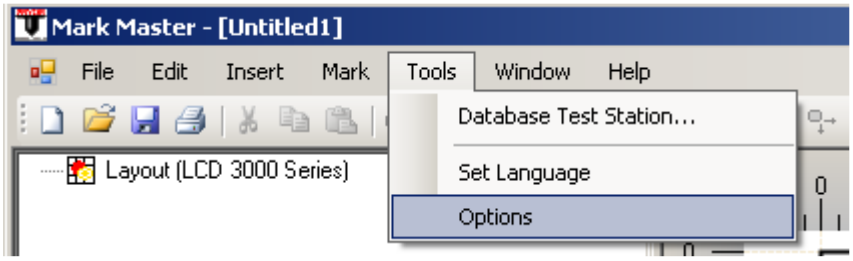
When Markmaster is initially installed, it installs as an evaluation version of the software. In evaluation mode the software is completely unrestricted for a period of 28 days.

During the first 28 days you will need to contact your distributor or Pryor for an unlock number which will unlock the software to your specific PC. It is advisable to only do this once the software is installed on the actual PC you intend to use the machine on for the long term. When the software is run the 'Marking Devices Available' screen will show the number of days left and also the serial and product numbers. You must supply these two numbers when requesting your unlock number.

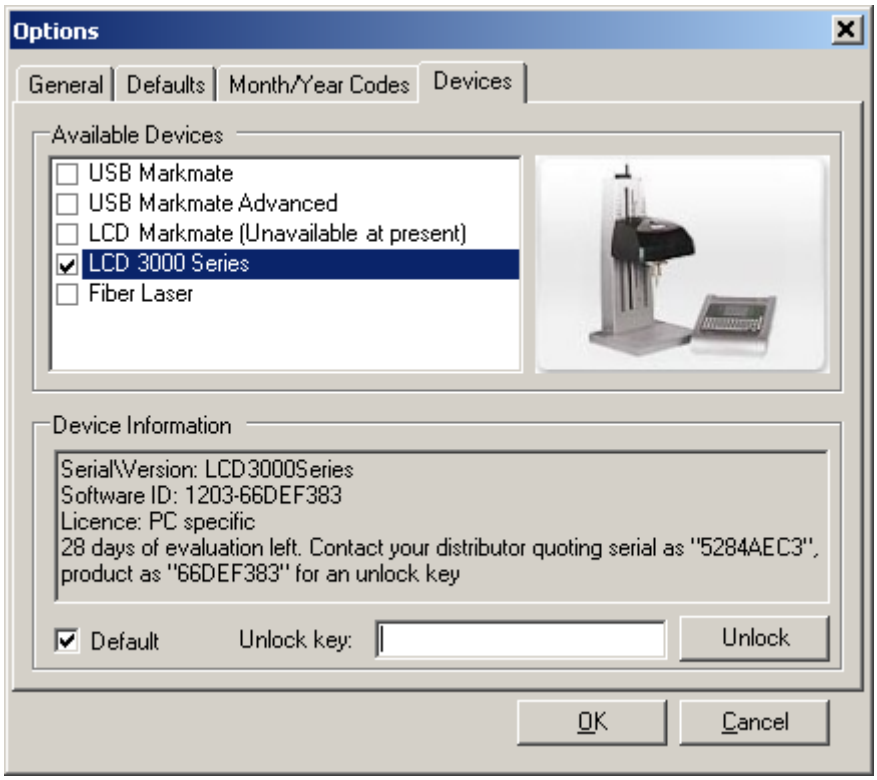


Note : The product and serial numbers are unique to each PC so only request the unlock details from the PC you intend to use in the long term.

Once you have your unlock number, go to the Options in the Tools menu.



Then click on Devices.



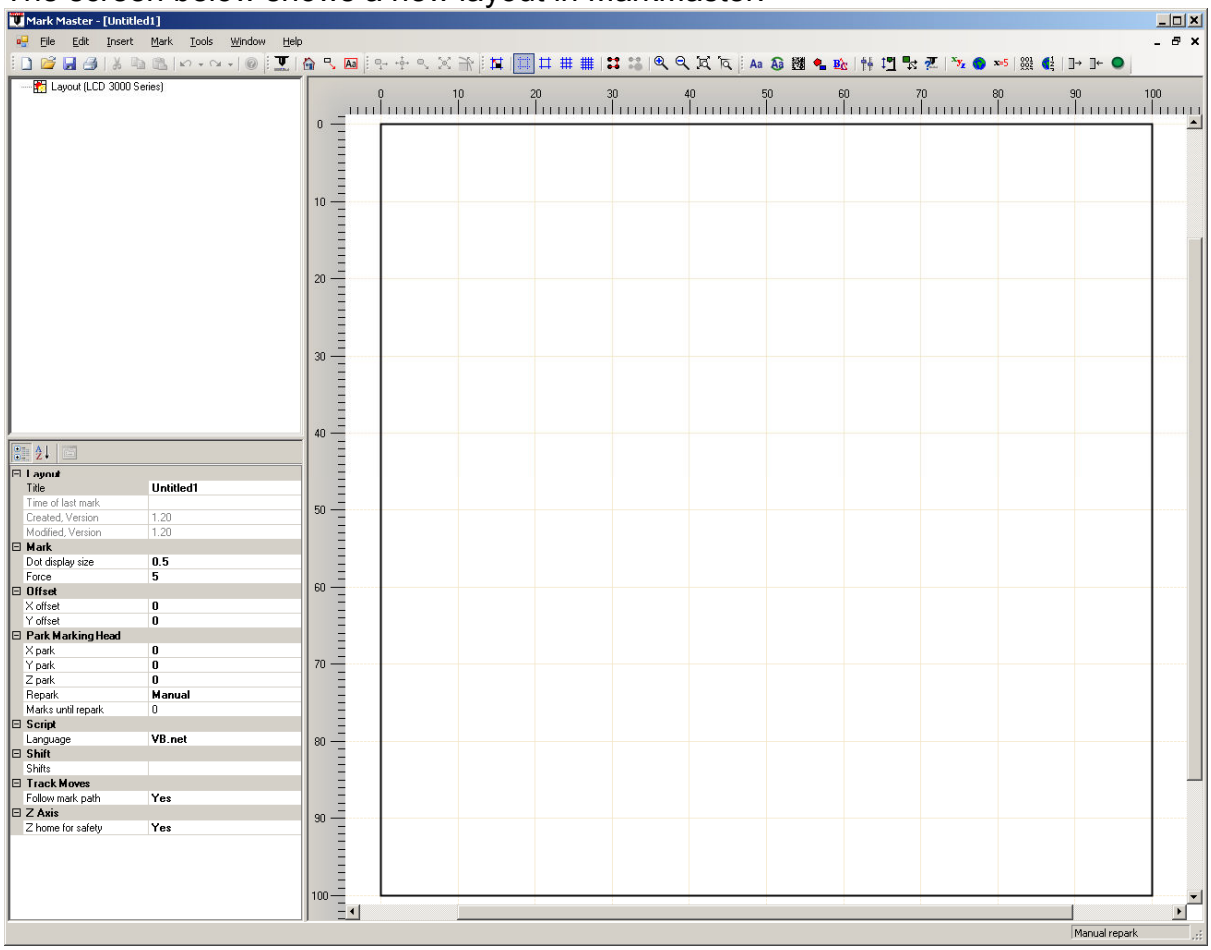
Select the LCD 3000 Series device. You can then enter your unlock key on the screen and click Unlock. If the unlock code is correct your software will be permanently unlocked on your PC.

SECTION 3
LAYOUTS

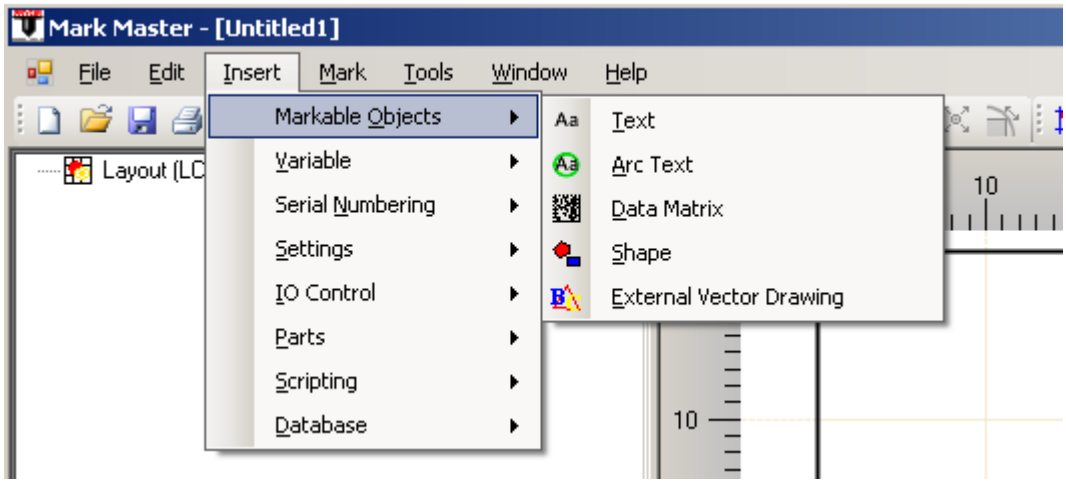
To produce any kind of mark a MarkMaster layout must be created. A layout contains information about the *Text* to be marked, its Font, its *Size*, *Force*, *XY* position and various other settings relating to the mark appearance.

Creating and marking a layout – Quick Start Guide

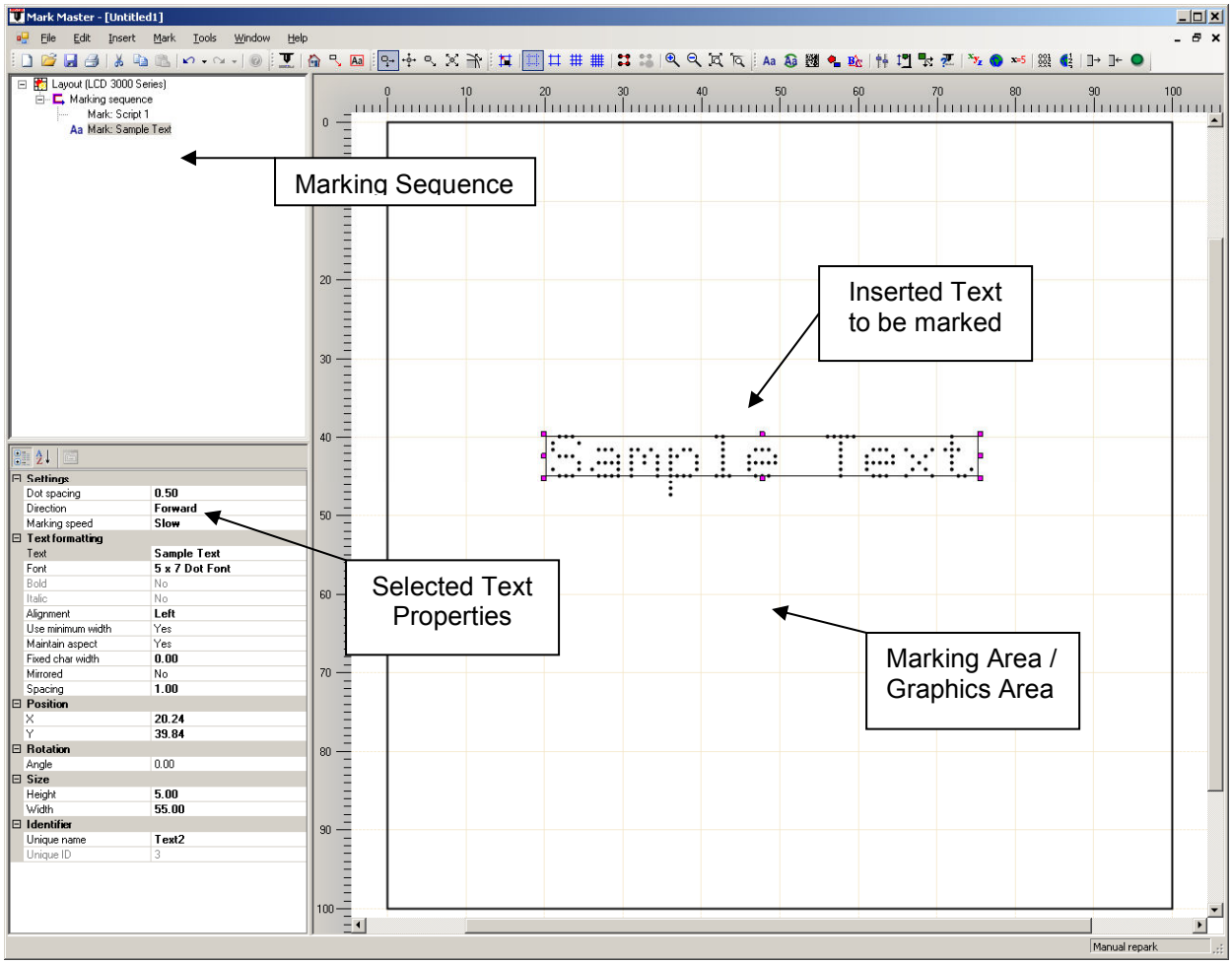
The screen below shows a new layout in MarkMaster.



The software can be controlled using the menus and menu items or the toolbar buttons below the menu. To place some text in the layout click the Aa button or select Markable Objects->Text from the Insert Menu.



This inserts the ‘Sample Text’ text on to the marking area.



The text object can be selected and manipulated using the mouse. When any layout object is selected either from the marking area or the marking sequence, its properties are displayed on the bottom left pane of the screen. The properties may be modified by clicking them with the mouse, entering a new value and pressing enter to update the screen. Other properties such as X & Y position, height, width and angle may also be changed directly using the mouse on the object directly in the marking area.

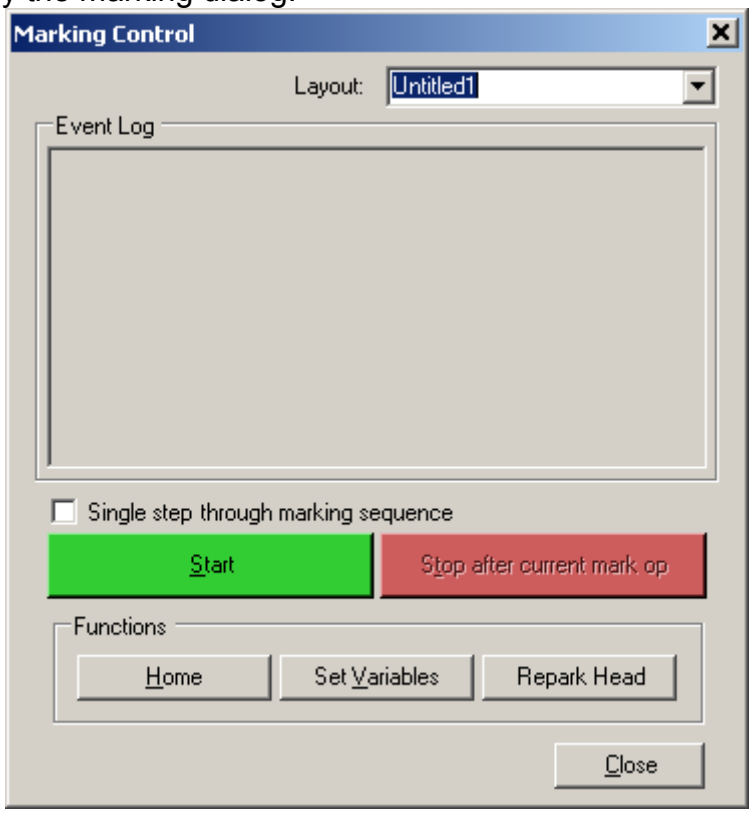
Trail Run of the mark

It is possible test the position of the mark on the actual part to be marked using the 'track moves' and 'outline object' features. To try this place a test piece under the marking head and adjust the gap between the stylus and the workpiece

Select the 'Sample Text' Text Object on the marking layout and press the  button on the tool bar to move the marking head to the top left corner of the text object. The marker will now track all moves made on that text object on screen as well as on the part itself. The position may be modified by dragging the object with the mouse or using the cursor keys. To move the marker around the outline of the text click the  button on the toolbar.

Marking the layout

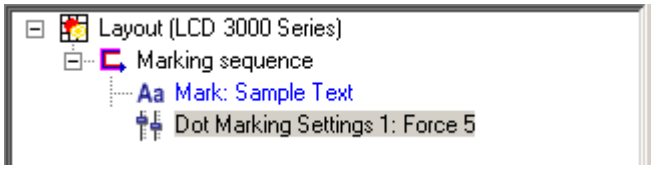
Once the object is in the required position for marking, click the  button on the toolbar to display the marking dialog.



Click Start and the marker will mark the text on the part. The Stop button on the screen may be used to stop the marker should this be required. When the mark is complete click the X in the top right corner to close the marking dialog and return the layout editing screen.

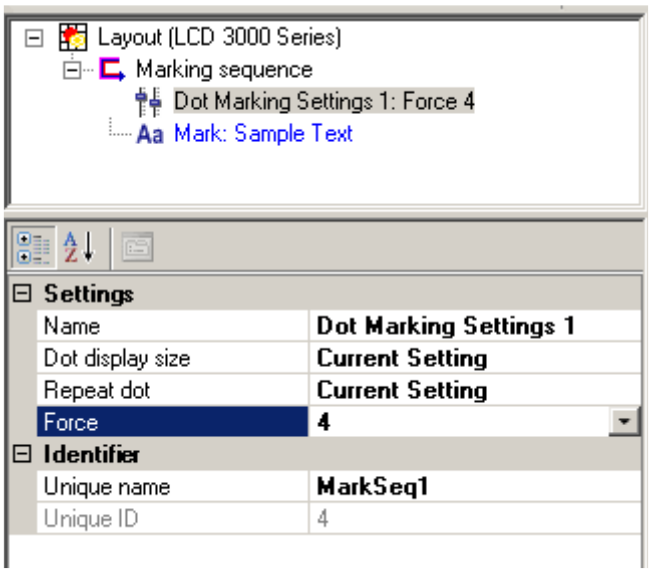
Adjusting the Mark Settings.

The mark depth may be modified using the Mark Settings tool. Click the  toolbar button this adds the Mark Settings tool to the marking sequence area of the screen.



Select the Mark Settings with the mouse and drag it above the Text Object as below.

Then change the mark settings to suit the depth of mark required.

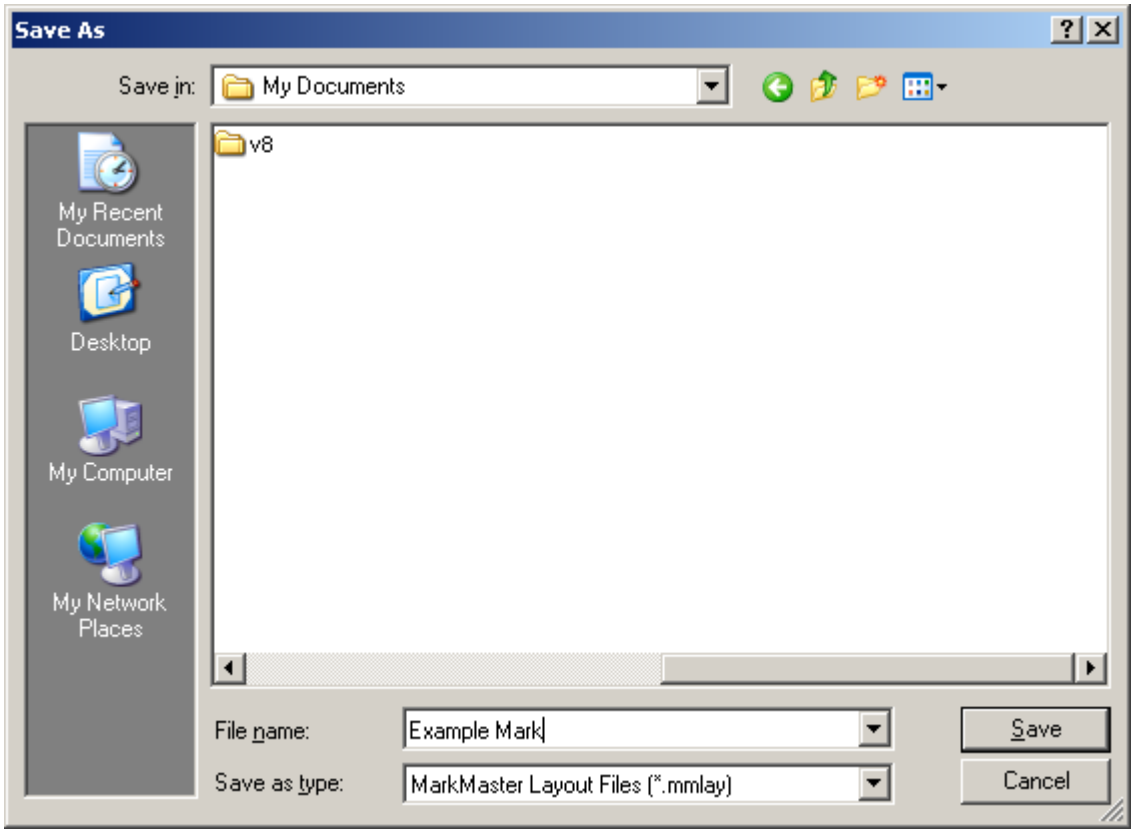


The example above changes the Force from the default value to a force of 4. The marking force can vary from 0 – 9. 0 is no mark and 9 is a deep mark. The gap between the stylus and work piece also affects the depth of the mark.

If several markable objects are to be marked at different mark settings, these can be grouped together in the mark sequence and several mark settings added. All markable objects below the mark setting tool will be marked with those settings until another mark setting tool is encountered in the sequence.

Saving a layout

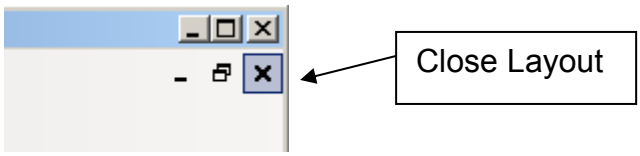
To save a layout so that it may be used later, click the  button on the toolbar. This displays the Windows File Save Dialog.



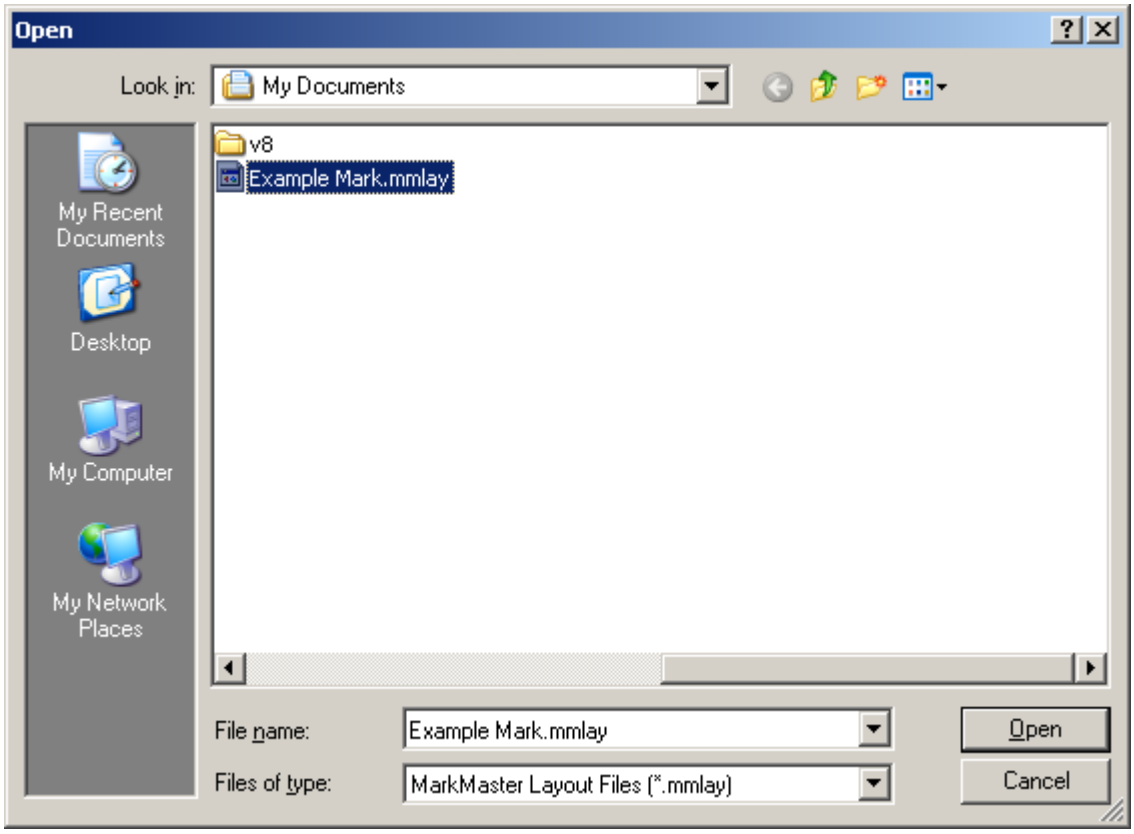
Enter a filename e.g 'Example Mark' and click save. The layout is now saved to the PC hard drive. In the example above the layout is saved to the My Documents folder.

Loading a layout

Once a layout has been saved it may be loaded at a later date. To demonstrate this close the layout using the lower X button in the top right corner of the screen.



Then click the  toolbar button to display the Windows file open dialog.



Browse to the location of the saved file, select it and click the Open button. The layout is then loaded into the software.

SECTION 4
Adding Objects to Layouts

Objects can be created using either the Toolbar or the Insert menu.

Creating Objects using the Tool Bar

The Toolbar is a quick way to create new markable objects within the current layout. Some of the more commonly used types of objects and the corresponding toolbar buttons are shown below.

Creates a Text Object within the layout.

Creates an Arc Text Object within the layout.

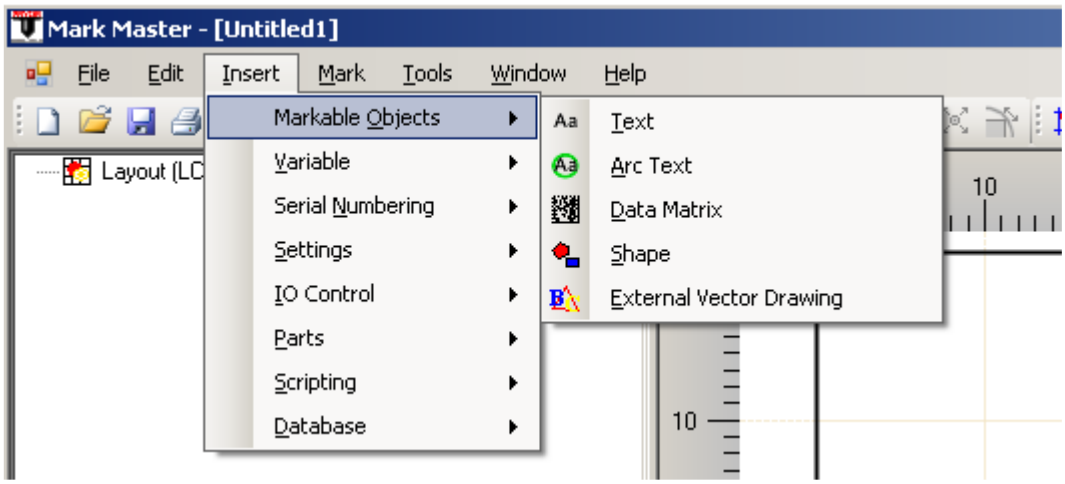
Creates an Imported Graphics File Object within the layout.

Creates a Shape within the layout.

When a new object is created using the toolbar, it is placed at the next free position in the marking sequence area of the screen. Once it is placed in the layout it can be edited by selecting it in the marking area. The object can also be moved by clicking it in the Sequence area of the screen and dragging to change its position in the marking sequence.

Creating Objects using the Menu

The Insert menu contains all the objects for inserting as part of a marking layout. Selecting one of these creates that object within the marking layout.



The Text Objects

The most commonly used markable object is the Text object . It is used for marking any type of text, be that static text or variable text. The Text object has many editable properties, changing these affects the way a piece of text is displayed and marked. Another commonly used markable object is the Arc Text . This is used for marking any type of text that is to be marked in an arc on a flat workpiece. A full description of each property is given below.

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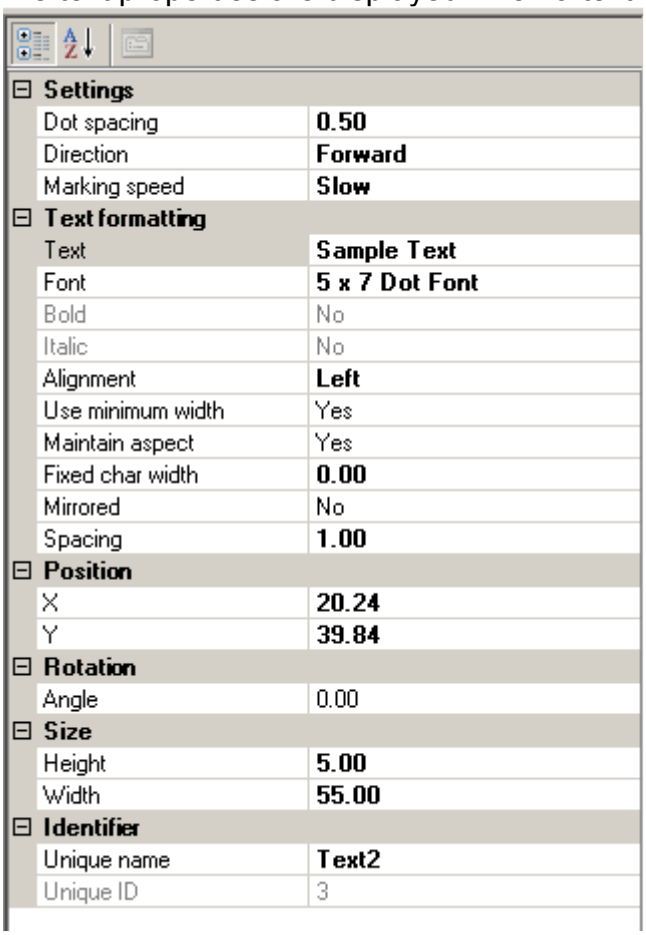
Text Properties

The text properties are displayed when a text object is selected



Settings	
Dot spacing	**0.50**
Direction	**Forward**
Marking speed	**Slow**
Text formatting	
Text	**Sample Text**
Font	**5 x 7 Dot Font**
Bold	No
Italic	No
Alignment	**Left**
Use minimum width	Yes
Maintain aspect	Yes
Fixed char width	**0.00**
Mirrored	No
Spacing	**1.00**
Position	
X	**20.24**
Y	**39.84**
Rotation	
Angle	0.00
Size	
Height	**5.00**
Width	**55.00**
Identifier	
Unique name	**Text2**
Unique ID	3

Text

The Text Object holds the actual text to be marked. Static text (text which will always remain the same within a layout) should be entered directly into this property. Any changes to this property will be reflected in the graphical view when enter is pressed or when the mouse is clicked away. The text property also has a … button which displays the Text Editor dialog for configuring variable text. See the Variables section for further details. The Text Object has the following properties assigned to it.

Note: You must click the mouse on the Text property for the button to be displayed.

Font

The font property is a drop down menu that lists all the currently installed fonts.

Maintain Aspect

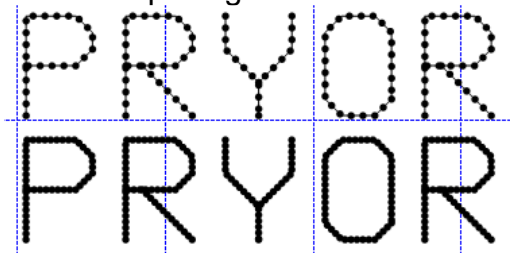
The Maintain Aspect property keeps the proportions between width within a specified text width window. Simply select Yes or No from the drop down menu within the Maintain Aspect edit field. If No is selected then the text will be re-sized to fill the specified text width window.

Dot Spacing

The Dot Spacing property affects the distance between dots when the marker is marking the following objects.

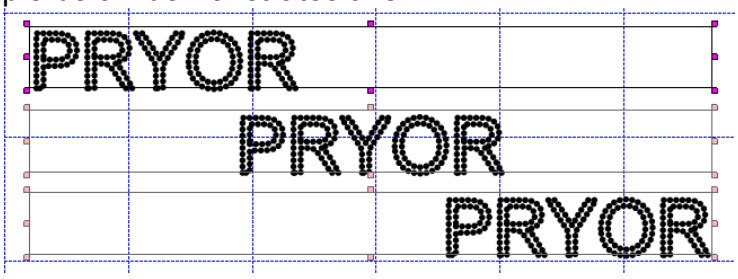
- Varidot Font
- True Type Fonts
- Shape Objects
- Imported Graphic Objects

Changing the dot spacing to a smaller value will give the impression of a solid continuous line when marked as the dots will be placed on top of each other. The marking cycle time will increase the smaller the Dot Spacing value is. The example below shows the dot spacing at 0.8 and 0.4.



Alignment

The Alignment property is used to specify how the text should be aligned within its bounding box. The text can either grow or shrink in length from the Left, Centre or Right. The example below demonstrates this.

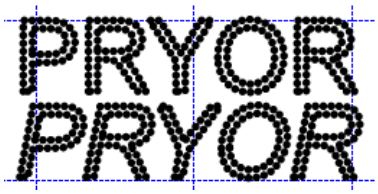


Bold

The bold property applies to true type fonts and when marked gives a bolder look to the characters.

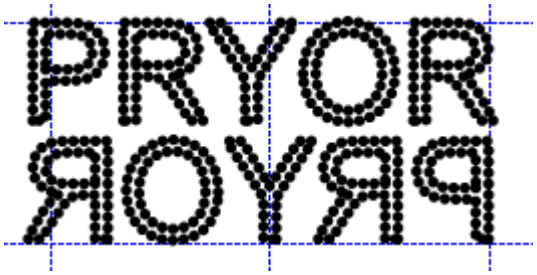
Italic

The Italic property applies to true type fonts the example below shows the italic effect.



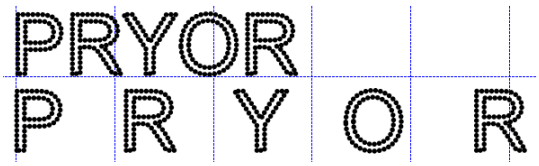
Mirrored

The Mirrored property marks the text in a mirrored format. This can be useful if marking on thin sheet to produce an embossed effect.



Spacing

The spacing property is used to add extra spacing between characters (default value is set to 1). The example below shows the spacing property set to 2; notice the increase in spacing between the characters.



X (mm)

The X (mm) position property displays the current position of the object on the horizontal or X plane within the layout. It is possible to adjust this value directly by entering a known position into the X position edit box or by graphically moving the object by ‘dragging’ the mouse.

Y (mm)

The Y (mm) property displays the current position of the object on the vertical or Y plane within the marking layout. It is possible to adjust this value directly by entering a known position into the Y position edit box or by graphically moving the object by ‘dragging’ the mouse.

Width Property

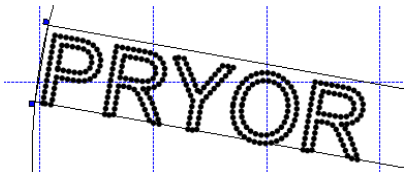
The Width property displays the overall width of the text to be marked. This value should be changed to stretch or condense the text. The width property can also be changed by graphically dragging the mouse on the width handle of the text object. See also the Use Minimum Width option when changing the Width property.

Height Property

The Height property displays the character height of the text to be marked. This value should be changed to stretch or condense the height of the text. The height property can also be changed by graphically dragging the mouse on the height handle of the text object.

Angle (deg)

The Angle property is used for setting the rotation angle of the object 0 – 360°. The object is rotated with respect to the objects origin. It is also possible to change this value graphically by dragging the mouse on the rotation handle of the object. In the example below the angle is set to 10°.

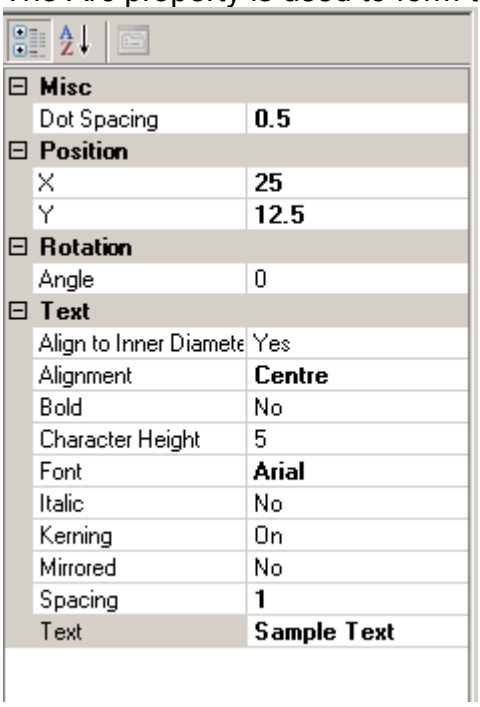


Arc Text

Arc Text Properties

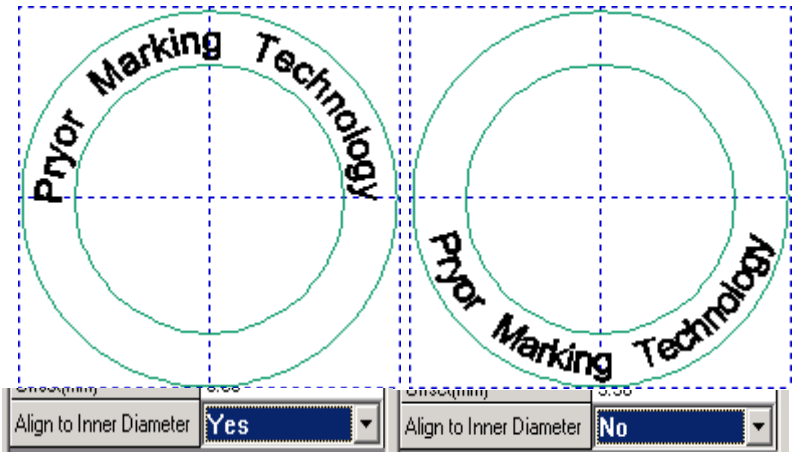
The Arc Text Object shares many of its properties with the Text object. The following properties are specific to the Arc text object.

The Arc property is used to form text around an arc.



Align to Inner Diameter

The Align to Inner Diameter property is used to align the arc text to the inner diameter (by selecting Yes from the drop down menu in the select field) or to the outer diameter (by selecting No from the drop down menu in the select field). An example of each is given below.

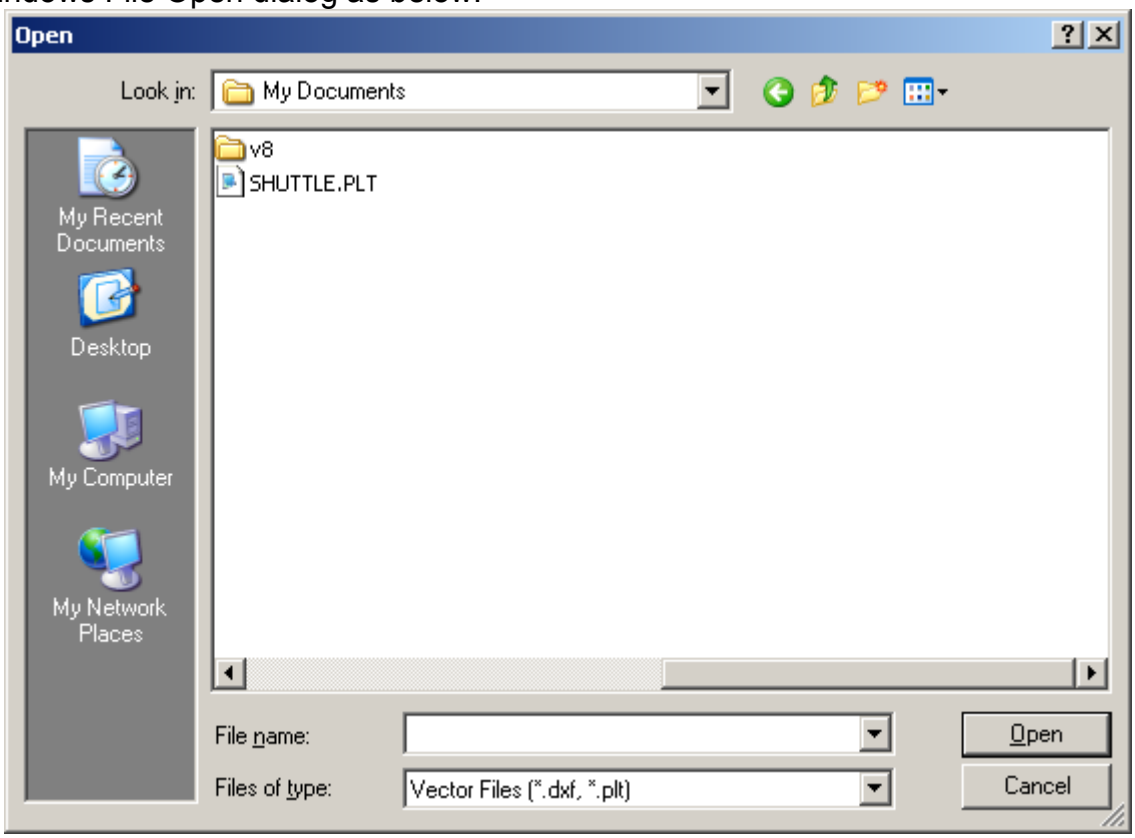


The Vector Drawing Object

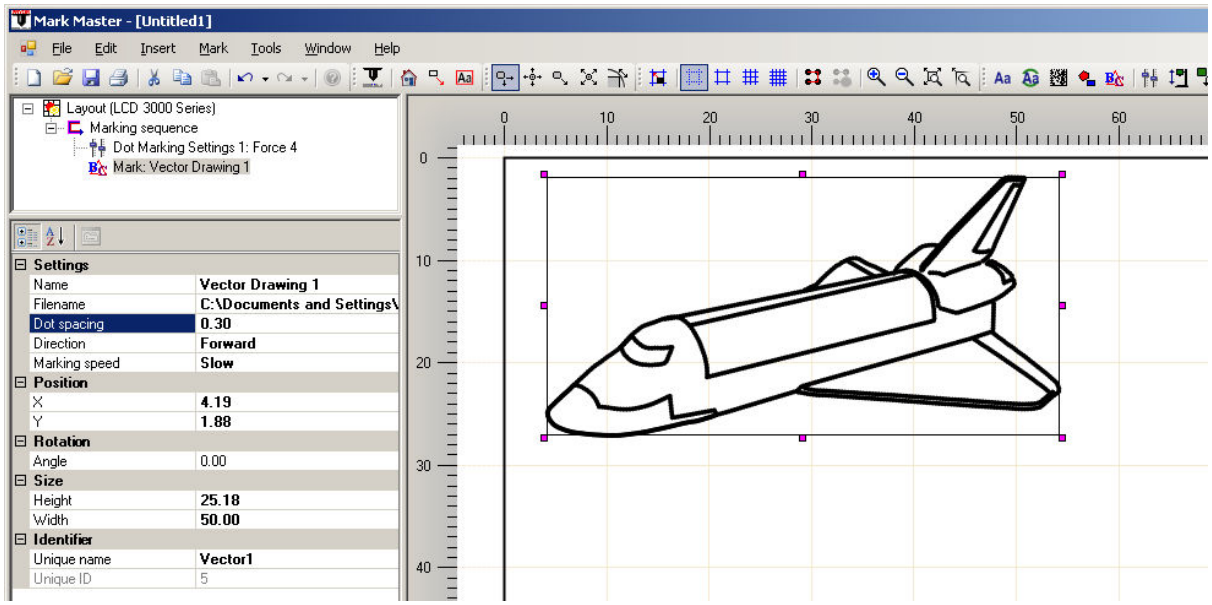
The Vector Drawing Object is used to allow graphical objects (HPGL logo's and vector drawings) to be imported into MarkMaster for marking. Complex drawings or logos can be imported from many drawing and CAD packages. The File formats supported by MarkMaster are.

- HPGL 1&2 (*.plt)
- AutoCAD DXF Revision 12 (*.dxf)

To import a file click on the Insert Vector Drawing icon, this displays the Windows File Open dialog as below.

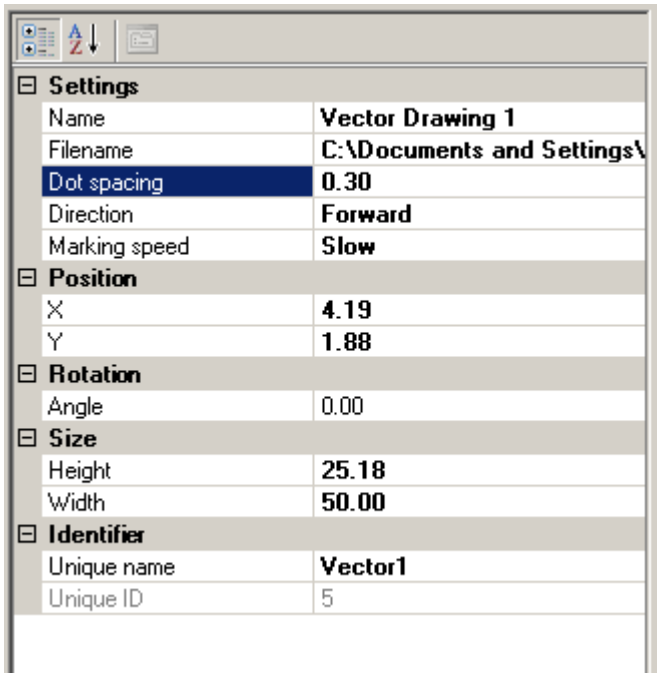


When the desired file is selected, Click Open and the object will be imported into the marking layout.



Note: When a layout is saved only the file path to the object is saved not the object itself. Always ensure that the imported graphics files remain at the locations pointed to within the marking layouts.

An Imported Graphics File Object has the following Properties available.



X (mm)

The X (mm) position property displays the current position of the object on the horizontal or X plane within the layout. It is possible to adjust this value directly by entering a known position into the X position edit box or by graphically moving the object by 'dragging' the mouse.

Y (mm)

The Y (mm) property displays the current position of the object on the vertical or Y plane within the marking layout. It is possible to adjust this value directly by entering a known position into the Y position edit box or by graphically moving the object by 'dragging' the mouse.

Width Property

The Width property allows the width of the vector drawing to be modified.

Height Property

The Height property allows the height of the vector drawing to be modified.

Angle (deg)

The Angle property allows the vector drawing to be rotated to any angle.

Filename

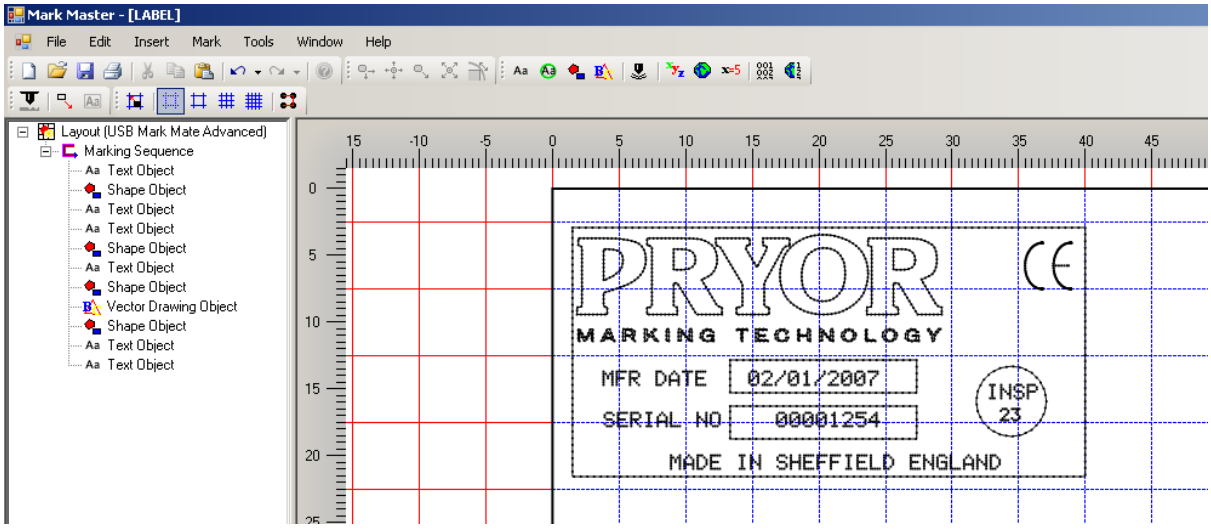
The Filename property allows the path to the graphic file to be changed to an alternative location by entering it directly or clicking on the … browse button.

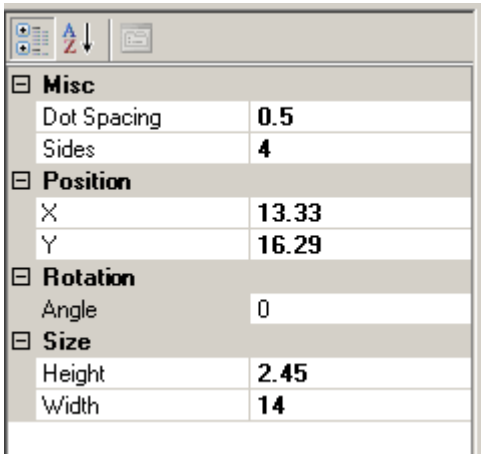
Dot Spacing

The Dot Spacing value allows the distance between the dots to be modified. Reducing the dot spacing can produce marks with continuous lines but this can affect the marking cycle time. It is worth experimenting with this value to obtain the optimum quality/cycle time compromise.

The Shape Object

The Shape Object provides a simple graphics tool for drawing triangles, squares, rectangles and circles for marking. The example below uses several shape objects to create a label template which can be marked directly onto a part, providing a label look without the label.





X (mm)

The X (mm) position property displays the current position of the object on the horizontal or X plane within the layout. It is possible to adjust this value directly by entering a known position into the X position edit box or by graphically moving the object by 'dragging' the mouse.

Y (mm)

The Y (mm) property displays the current position of the object on the vertical or Y plane within the marking layout. It is possible to adjust this value directly by entering a known position into the Y position edit box or by graphically moving the object by 'dragging' the mouse.

Width Property

The Width property allows the width of the shape to be modified.

Height Property

The Height property allows the height of the shape to be modified.

Angle (deg)

The Angle property allows the shape to be rotated to any angle.

Sides

The Sides property allows the shape of the object to be defined. For example to mark a square or a rectangle specify 4. To mark a triangle 3 and to mark a circle specify 20+.

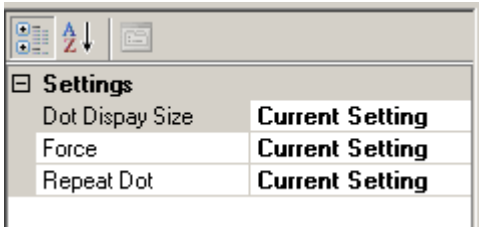
Dot Spacing

The Dot Spacing value allows the distance between the dots to be modified. Reducing the dot spacing can produce marks with continuous lines but this can affect the marking cycle time. It is worth experimenting with this value to obtain the optimum quality/cycle time compromise.

The Mark Settings Tool

The Mark Settings Tool is used to change the marker settings within the marking sequence. Primarily this is used to change the depth of the mark on the material of the part being marked. If the material is a soft aluminium a lower force and smaller stylus to work piece gap should be used. If the material is hardened steel then a larger gap and higher force should be used. Also the dot spacing used on a markable object plays an important role in the appearance of the mark. Experimenting with different spacing and force settings on different materials will soon provide an understanding of the machines capabilities.

Several Mark Setting Tool Objects may be used in a marking sequence especially if marking Dot 5x7 fonts and Shape or Vector Drawing objects in the same layout. Simply drag the Mark Setting tool above the markable objects which require those mark settings. The software will process the Marking Sequence in order and therefore set the mark settings, then mark objects below at those settings until a different mark setting tool is encountered



Dot Display Size

The Dot Display Size property allows the size of the dots in the marking layout area of the screen to be changed. If your application is marking at a low force with small characters it is often useful to reduce the size of the dots on screen to give a clearer preview of the mark. This is demonstrated below. The Dot Display Size on these two Text Objects is 0.3 and 0.5 respectively.

Force

The Force property allows the depth of the dots in the material to be adjusted. The higher the force the harder the stylus impacts onto the part. The force ranges from 0 – No Mark to 9 – Deepest Mark.

Note : The gap between the work piece and the stylus also impacts on the depth of the mark. Increasing the gap also increases the depth. Typical marking gaps are between 1 – 5mm.

Repeat Dot

To obtain even deeper marks it is possible to repeat each dot up to 3 times. Use the Repeat dot property to achieve this.

SECTION 5
SERIAL NUMBERS AND VARIABLES

Serial numbers

Introduction

Serial numbers automatically increment or decrement after a layout has been successfully marked. Serial numbers can consist of numbers or letters, the actual sequence they follow can be defined if the standard 0000-9999 configuration is inadequate.

There are two kinds of serial numbers, global and layout.

Global serial numbers

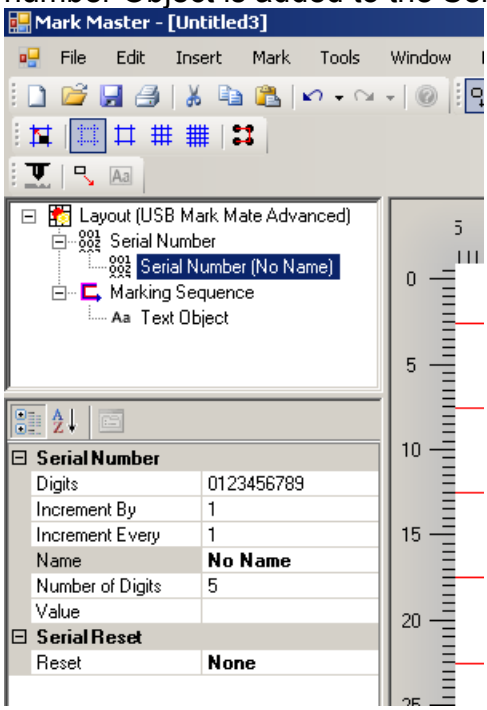
A global serial number is unique, it increments by 1 every time that it is marked. If the global serial number is specified for example, in 5 places in a layout then the layout will mark 5 sequential numbers. The global serial number is shared by all layouts.

Layout serial numbers

Each layout has its own serial numbers. They are stored with the layout. Layout serial numbers may increment or decrement by specified amounts after a specified number of marks have been completed. The configuration of each layout serial number may be specified individually.

The Serial Number Object

The Serial Number Object allows layout serial numbers to be added to a marking layout. When the Insert Serial Number button is pressed on the toolbar the Serial number Object is added to the Serial Number section above the Marking Sequence.



Selecting the Serial Number object displays its properties below.

Digits

The Digits property specifies how the serial number counts. The default value is '0123456789'. This means that when the end digit reaches 9 it loops back round to zero and continues counting. If the digits property was set to '0123456789ABCDEF' then it would reach 9 and then continue to A, then B etc until F when it would then loop round. (i.e. it would count in hexadecimal)

Increment By

The Increment By property specifies by how much the serial number should count up by after it is marked. The default value for this is 1.

Increment Every

The Increment Every property specifies how often the serial number should increment. This is useful if 3 parts need to be marked with the same serial number. Setting the Increment Every property to 3 will then mark 3 parts before incrementing the serial number.

Name

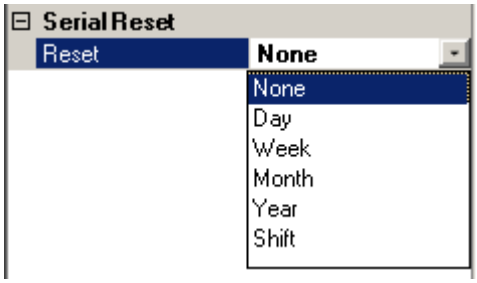
The Name property allows each serial number in a layout to be given a meaningful name. This is useful later when the serial number needs to be inserted in to the layout for marking.

Number of Digits

The Number of Digits property is useful for specifying how many leading zeros should be marked for a serial number. For example if the Digits is set to 5 and the serial number value of 3 is entered. Then the marker will mark 00003 to make it up to 5 digits. The digits property is also useful for specifying a roll over value. For example, if the digits is set to 2. Then when the marker marks 99 it will roll over to 01.

Reset

The Reset property allows serial numbers to be reset on certain events. The options available are:-



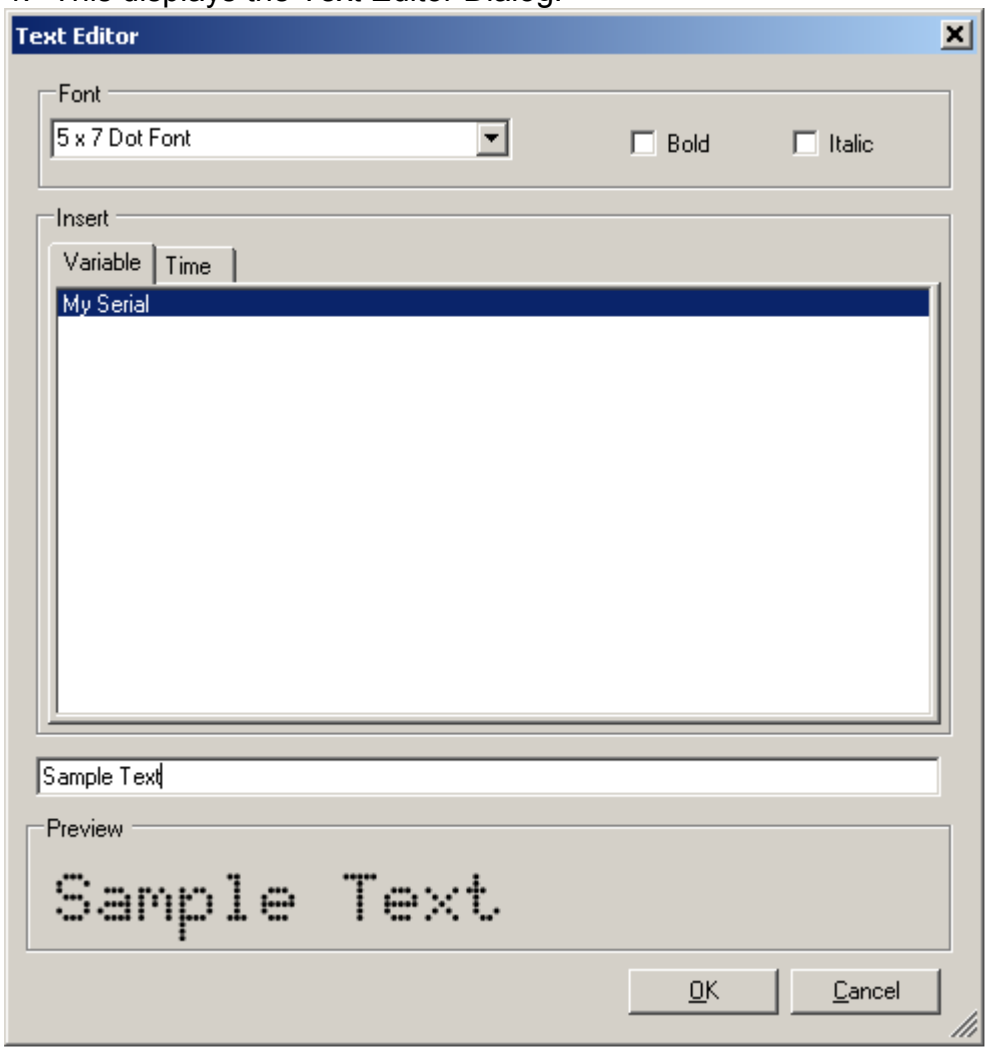
Therefore it is possible to reset the serial number to 00001 (if digits are set to 5) when the Day changes, Week Changes, Month Changes, Year Changes or Shift Code changes.

Marking a Serial Number

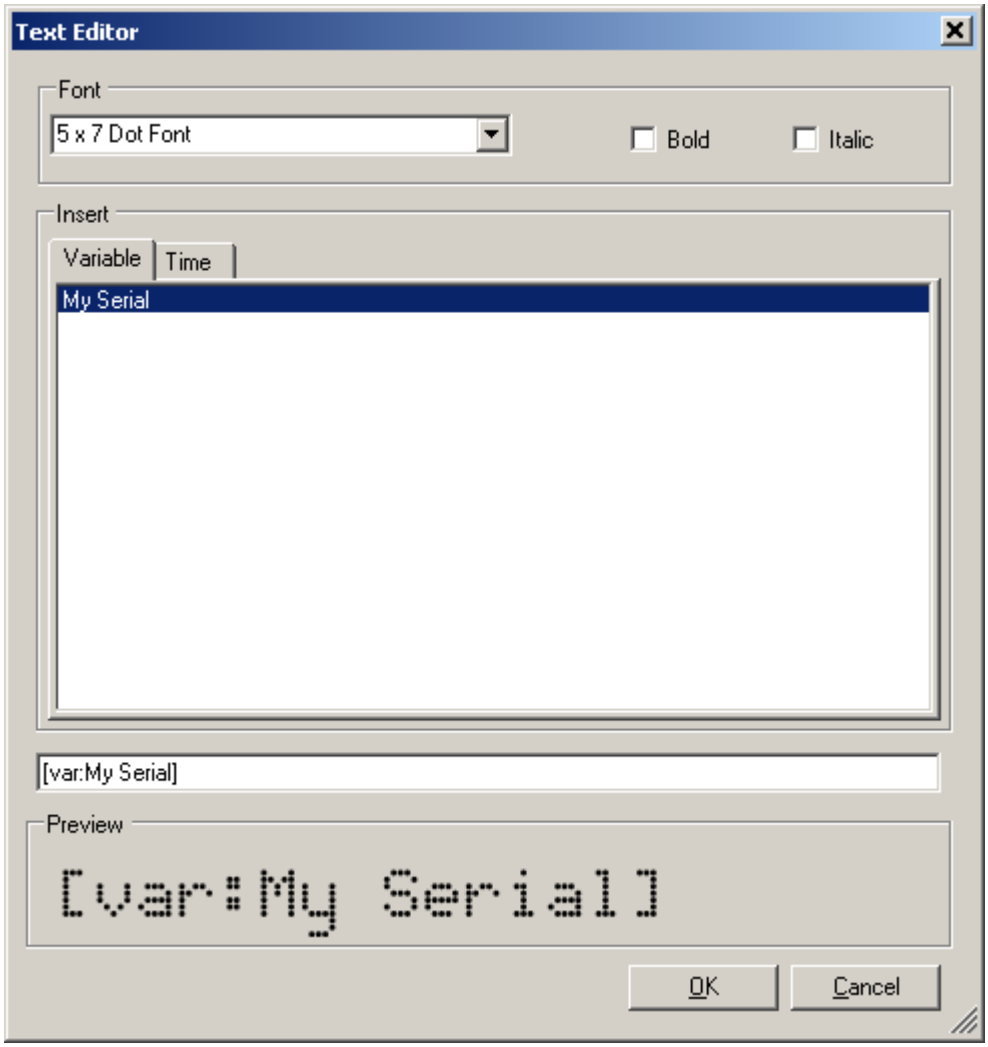
When the serial number is given a meaningful name and its properties are configured, it can now be added to the marking layout so it can be marked. To do this we must 'link' it to a text object. Follow the procedure below to do this.

1. Configure the Serial Number and give it a name of 'My Serial'
2. Insert a Text Object into the layout by clicking the Aa button.
3. Select the Text object and click the ... button on the Text Property.

4. This displays the Text Editor Dialog.



5. Select the 'Sample Text' and delete it. Then select 'My Serial' from the Variable Tab and click Insert.



6. Then click OK. The serial number will now be displayed within the text object on the layout.

The Global Serial Number Object

The Global Serial Number object allows global serial numbers to be added to a marking layout. The global serial number object may be shared across several layouts to ensure only unique serial numbers are marked across a range of different parts.

The Global Serial Number shares the same properties as the standard Serial number (See Previous Section). The only difference is that the same serial number name can be used in other layouts and the globally stored value will automatically be used every time that global serial number is referenced in a layout.

Several Global Serial numbers may be created if required.

Variables

Introduction
Variables enable text objects to be changed without having to edit the whole layout. When the variables are edited prompts can be displayed so that the operator knows what each variable is.

There are two kinds of variables, global and layout.

Global variable
A global variable is shared between all layouts. Therefore it only has to be changed once for this to affect all layouts which use it.

A global variable could be used to hold an inspector's initials which would then be incorporated in all layouts marked by that inspector, for example.

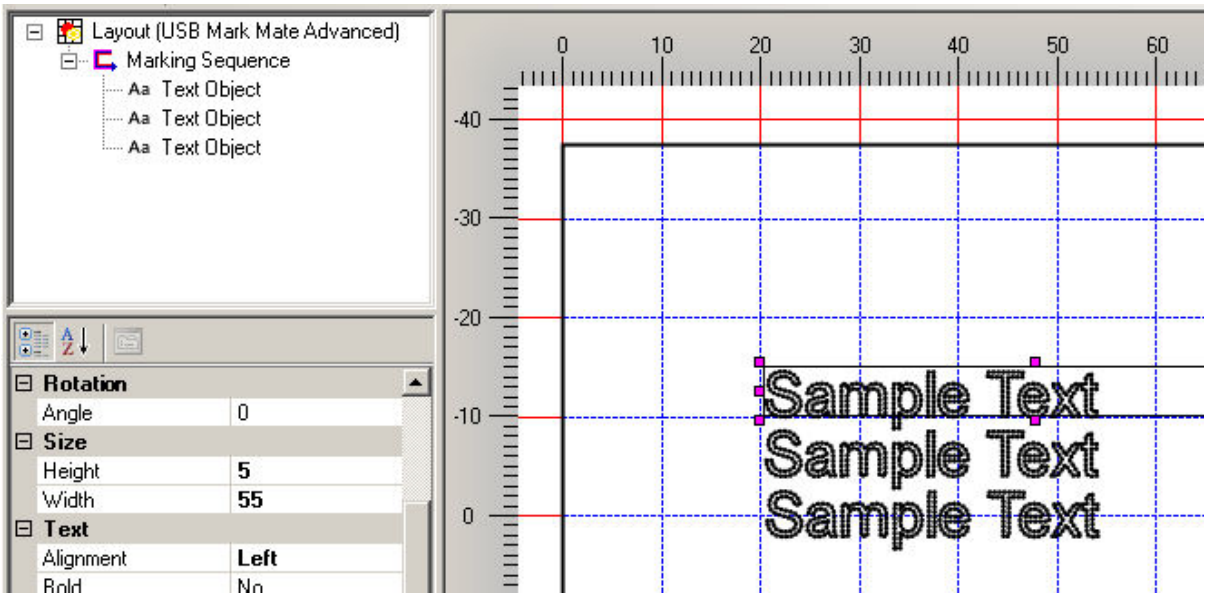
Layout variables
Each layout has its own variables. They are stored with the layout. A *Prompt* may also be specified, as a reminder of what each variable is when the variables are edited.

The Variable Object 

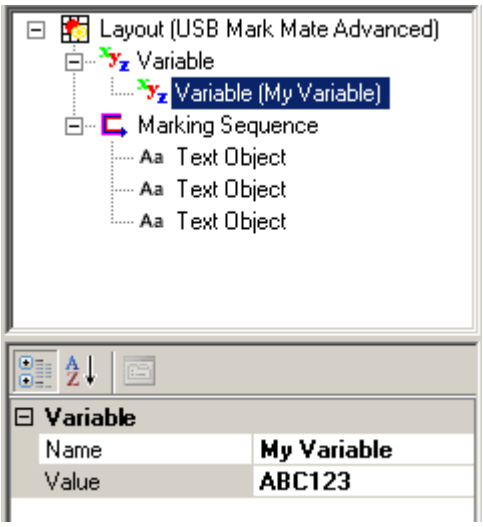
Variables hold information to be marked separate from the text objects themselves. The simplest use of a variable would be if the same piece of text is marked in several places in a layout. The variable could contain the text to be marked, and all the text objects in the layout could be 'linked' to it. Then to change the text being marked across the whole layout would only require the variable to be changed, all the objects linked to it would then change automatically.

To demonstrate this, follow the procedure below.

1. Create a new layout.
2. Add 3 Text Objects by clicking the  button 3 times. Then position the Sample Text objects so they can be clearly seen on the screen.

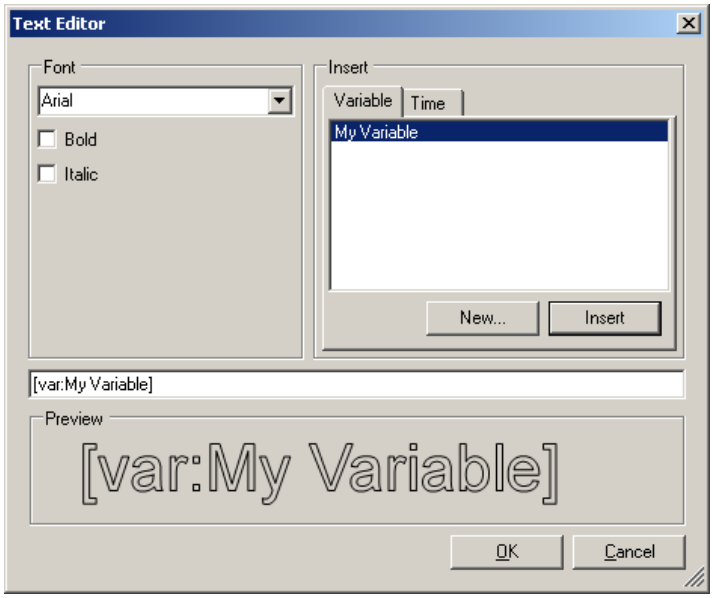


3. Now click the Variable button to add a Variable above the marking sequence.

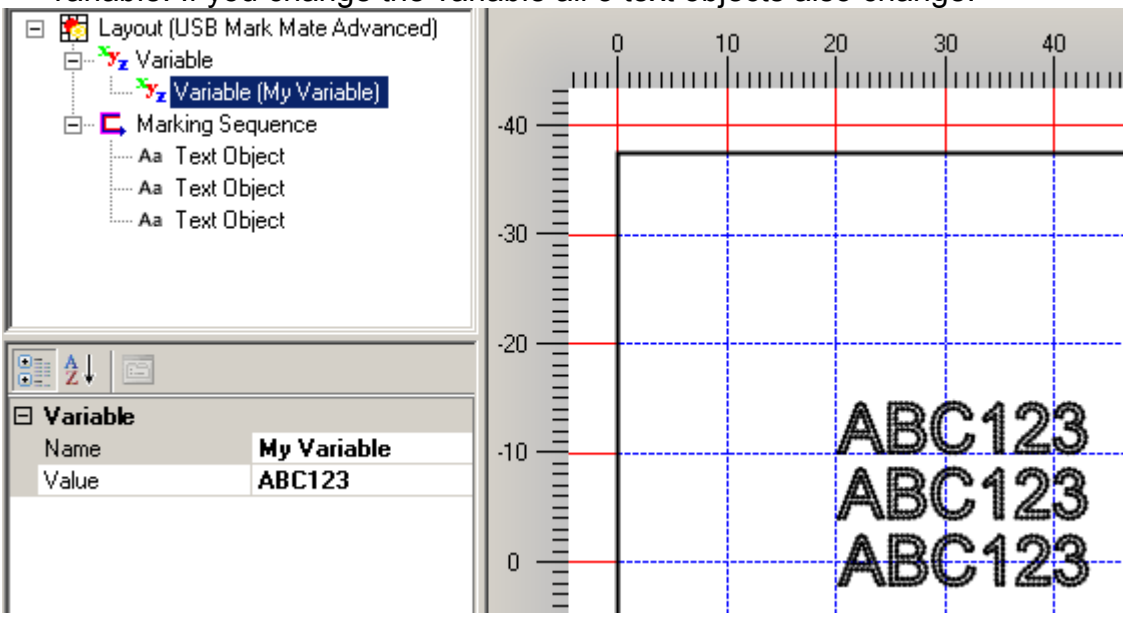


4. Name the Variable ‘My Variable’ by selecting it in the Mark Sequence and changing its Name property from ‘No Name’ to ‘My Variable’. Then give the Variable a Value of ‘ABC123’ this is the text which will be marked.
5. Then select the first text object and click the … button on the Text property.

6. In the Text Editor dialog, delete the ‘Sample Text’ text, select the ‘My Variable’ variable in the list and click Insert. Then Click OK.



7. Repeat this for each text object. Then all 3 text objects are linked to the one variable. If you change the variable all 3 text objects also change.



The Global Variable Object

Global Variables operate in exactly the same way as normal Variables (see previous section) except they may be used across a number of layouts. The value of the Global variable is stored globally in the software, so whenever it is edited all other layouts which use it are also updated. When using the global variable in multiple layouts ensure a global variable is added to the layout and the same name is given across the layouts it is used in, otherwise it will not use the same value.

The Set Variable Value Object

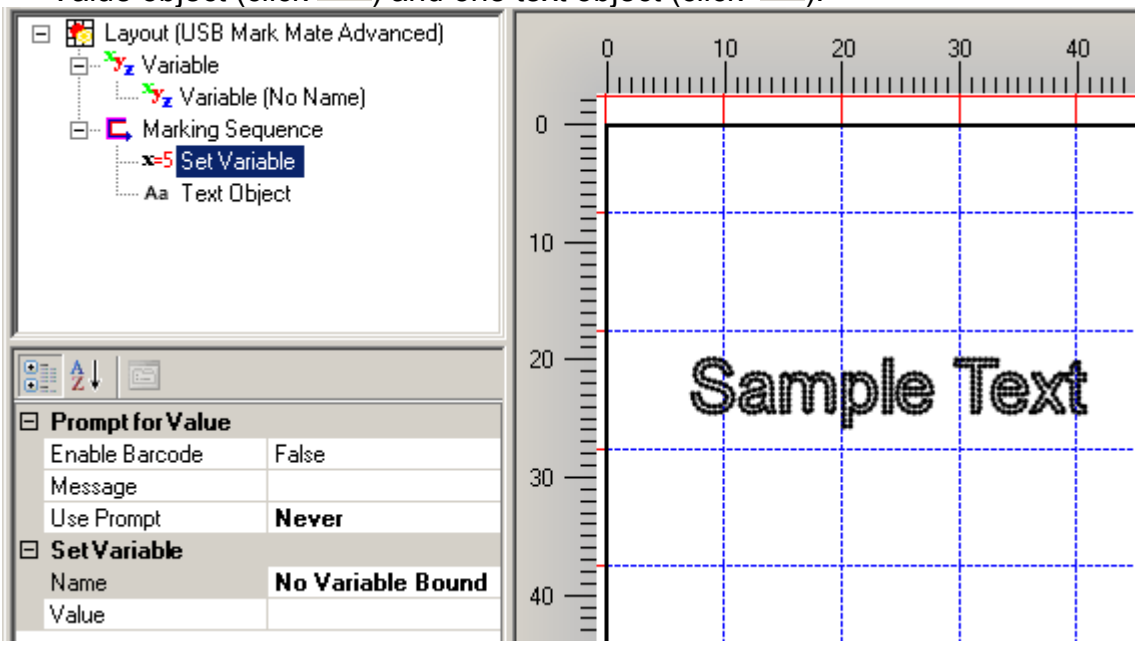
As demonstrated earlier in this section Variables are basically a way of storing text to be marked in a single place which may then be linked to text objects for marking. Up until now the only way to modify the variable value has been to select it in the marking sequence and edit the value directly.

The Set Variable Value Object provides other ways of modifying variable values.

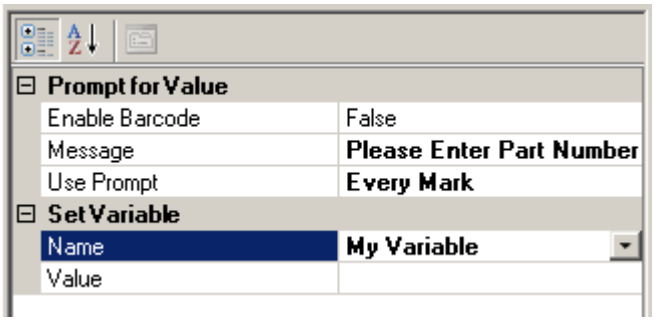
The simplest method is to prompt the user to enter specific details at the time of marking. This can be done using the 'Use Prompt' and 'Message' properties of the Set Variable Value object.

To demonstrate follow the procedure below.

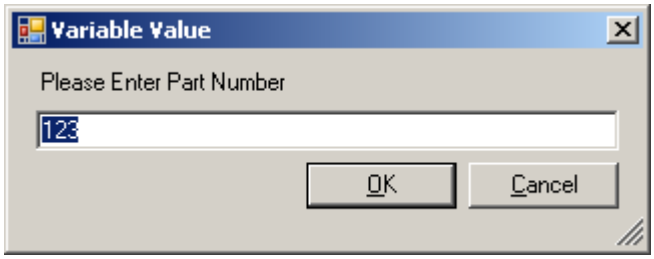
1. Create a new layout and insert one variable (click), one Set Variable Value object (click) and one text object (click).



2. Ensure the Set Variable Value object is above the Text Object, click and drag it above if it is not.
3. Select the Variable and Name it 'My Variable' and give it an initial value of '123'
4. Link the Text object to the 'My Variable' using the button on the text objects Text property. (See previous section for details on this.)
5. Select the Set Variable Object and change the Message property to 'Please Enter the Part Number' and change the Use Prompt to 'Every Mark'.
6. Set the Name property in the Set Variable Object to 'My Variable'. This tells the Set Variable Object which Variable it is modifying.



7. Now place some test material under the marker and click the button to open the mark dialog. Then click Start.. The software will now prompt for the Part Number to be entered.



8. Enter a different value eg. '321'. Once entered the part will be marked with this value.

If several variables are in the layout then several Set Variable Value objects can also be inserted. This allows the software to prompt for several values to be entered before the marking commences.

A barcode scanner could also be connected to the PC to allow details from a barcode to be scanned in to prevent the risk of typing errors.

Note: It is important that the Set Variable Value object is above the text object to which it is ultimately linked otherwise the value may be modified after it has already been marked.

Enable Barcode

The Enable Barcode property may be set to True if an RS232 barcode scanner is attached to the PC. The scanner should be configured to transmit in the format.

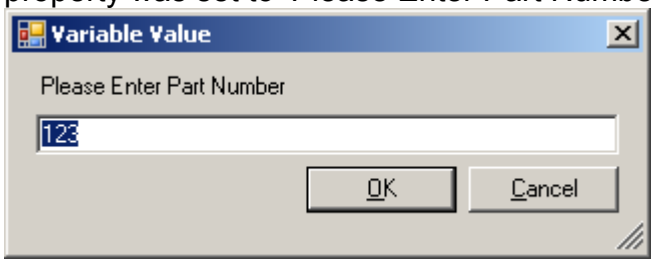
<STX>data<ETX> at the RS232 settings below.

Baud Rate – 9600
Data Bits – 8
Parity – None
Stop Bits – 1

If using a keyboard wedge type scanner (these normally have PS/2 or USB connectors) then the Enable Barcode can be left at False as these types of scanner simulate the PCs keyboard.

Message

The Message property is the message displayed to the user when the software prompts for the variable value to be entered. In the Example below the Message property was set to 'Please Enter Part Number'.



Use Prompt

The Use Prompt defines whether the Set Variable Value object prompts the user for information to be marked. Setting this to None, disables the feature, setting it to Every Mark allows the software to prompt for information on every mark and the On Request Option allows the details to be updated only when requested by the user.

To request to update the variables the user should press the 'Set Variables' button on the Marking Dialog. This is useful if the details only change at the start of a batch of marking. Then the user is not prompted continuously to modify the variables.

Name

The Name property is a drop down box showing all variables in the layout. Simply select the variable to be modified with this property.

SECTION 6
TIME AND DATE FUNCTIONS

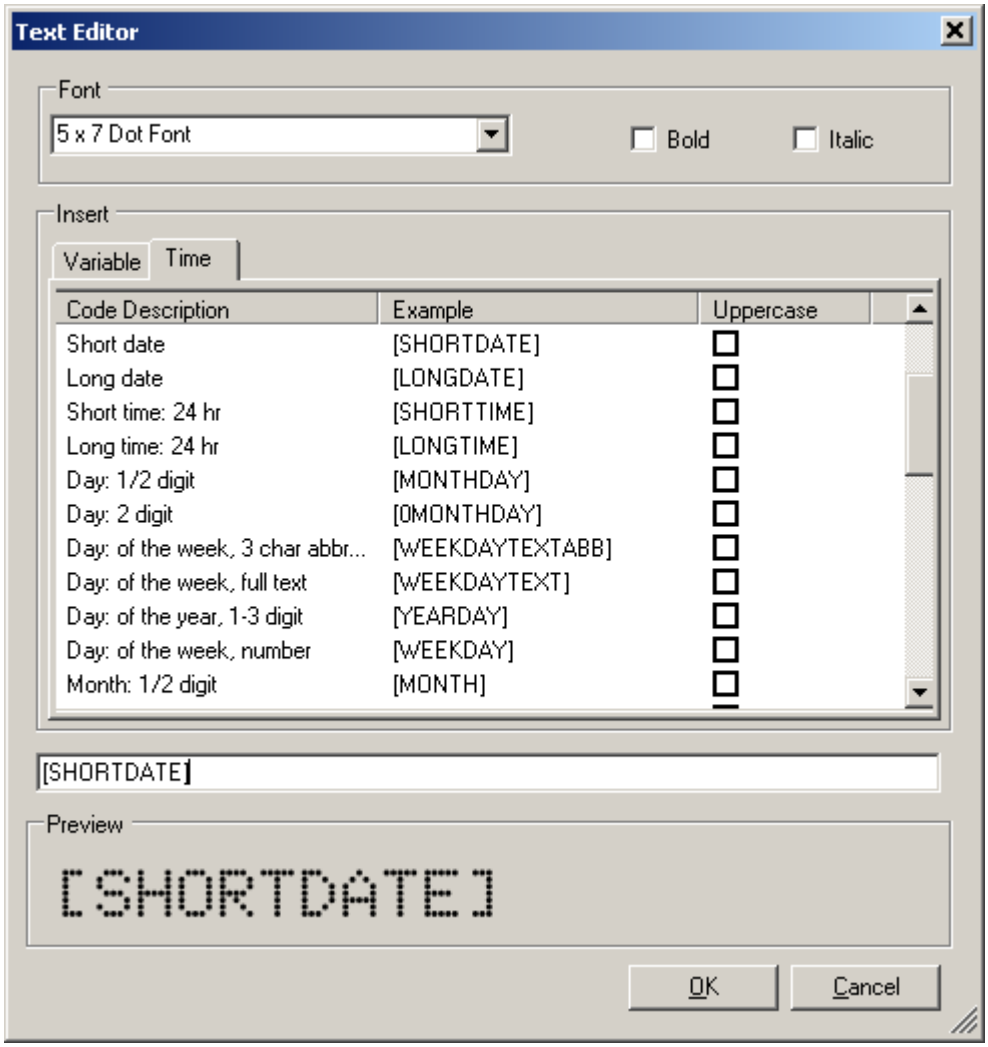
Introduction

Markmaster can mark a variety of time and date information based on the PCs real-time clock. This information can be incorporated into a layout in several different ways.

The following commands can be typed directly into a text object, alternatively they can be selected from the Text Editor dialog which is accessed using the button on the Text Property of the Text Object.

Command	Value
[HOUR]	Hour 0-12.
[0HOUR]	Hour 00 – 12 (2 Digit)
[HOUR24]	Hour 0-23
[0HOUR24]	Hour 00-23 (2 Digit)
[AMPMTEXT]	AM/PM Text
[AMPM]	0 – AM, 1 – PM
[MINUTE]	Minute 0-59.
[0MINUTE]	Minute 00 – 59 (2 Digit)
[SECOND]	Second 0-59.
[0SECOND]	Second 00 – 59 (2 Digit)
[SHORTTIME]	HH:MM
[LONGTIME]	HH:MM:SS
[MONTHDAY]	Date 1-31
[0MONTHDAY]	Date 01-31 (2 Digit).
[MONTH]	Month 1-12.
[0MONTH]	Month 01-12 (2 Digit)
[MONTH0]	Month 00-11 Month Number starting at zero
[MONTHTEXT]	January - December
[MONTHTEXTABB]	Jan - Dec
[YEAR]	Year 2000 - 2099.
[SHORTDATE]	DD/MM/YYYY
[LONGDATE]	DD/January-December/YYYY
[YEARDAY]	001-365
[WEEKDAY]	1- Monday, 7 - Sunday
[WEEKDAYTEXT]	Monday - Sunday
[WEEKDAYTEXTABB]	Mon - Sun

To add time and date commands using the Text Editor dialog click the button on the text object. This displays the dialog below.



Select the Time tab and select the time / date option required, press Insert and OK and the option is added.

SECTION 7
ADDITIONAL FEATURES

Home position

The marking head has a fixed XY axis home position, normally at the top left corner of the marking area. This position is sensed by two proximity switches. The marking head will return to this position before and after a layout is marked. This ensures that marks are produced in the same place every time. The *XY* positions of marks are normally specified relative to this home position, unless offsets are defined.

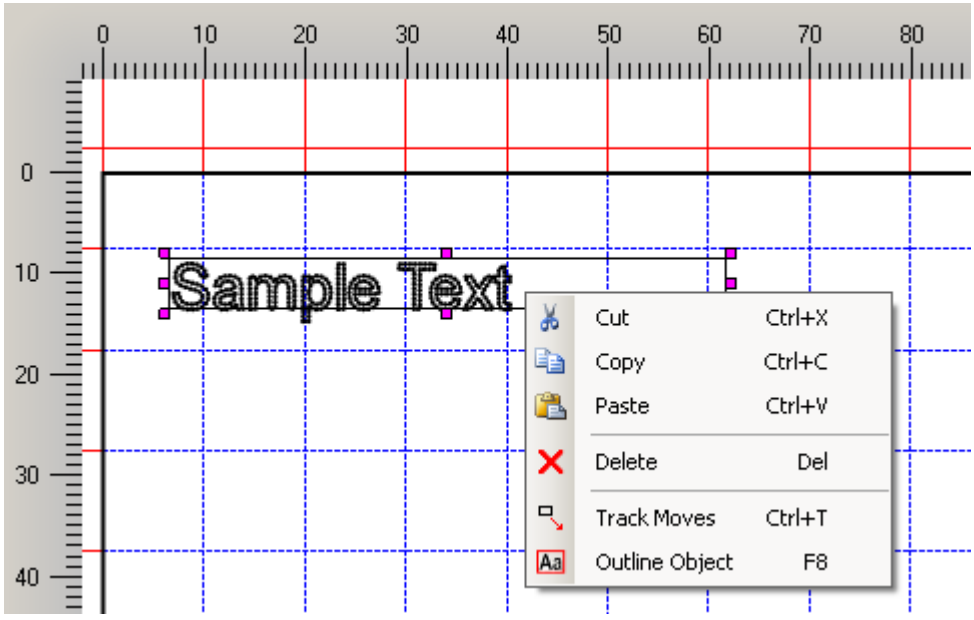
The Mark Dialog has a home button, this can be used to manually home the machine.

Offsets

X and Y offsets can be programmed to the layout. This can be a useful feature if you are marking batches of parts a distance from the home position. If you program an X offset of 20.00mm and a Y offset of 30.00mm then the marker will move to that position at the end of the mark rather than return all the way home.

Trial Run / Track Moves

MarkMaster allows individual markable objects to be positioned directly on to the part using the track moves feature. The easiest way to use the feature is to select an object in the marking area and right click the mouse on it. This displays the context menu.



Selecting Track Moves allows the marker to move to the top left position of the object selected. Moving the object with the cursor keys or mouse will cause it to move on screen and on the marker also. To trace around the object on the part select Outline Object or press F8.

The distance the cursor keys jog the object is adjustable by setting the grid resolution.

The Grid resolution toolbar has the following settings.

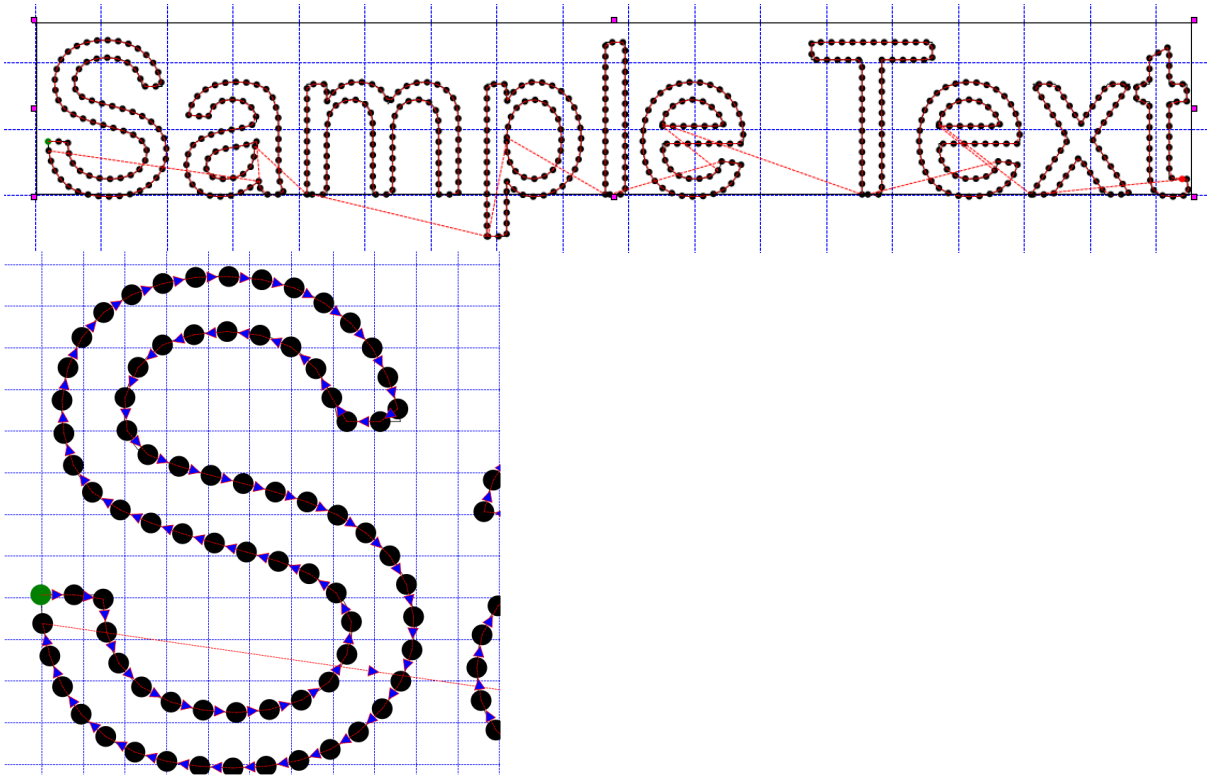
- Snap to Grid
- Grid Resolution Automatic (Based on the Zoom Level)
- Grid Resolution 10mm
- Grid Resolution 5mm
- Grid Resolution 1mm

When the grid resolution is 10 mm the jog step for each cursor press is 1mm, when the grid resolution is set to 5mm the jog step is 0.5mm and when it is set to 1mm the jog step is 0.1mm.

When you are finished aligning the objects to the parts, select Track Moves again to send the marking head home.

Show Dot Path

The marker moves from Dot to Dot when marking a layout. It is possible to view the actual marking path that will be taken by toggling the Show Dot Path button  . Below is an example of this feature.



SECTION 8
DATABASE CONNECTIVITY

The MarkMaster software features various powerful database connectivity tools, allowing the software to query data from and write back to various database systems.

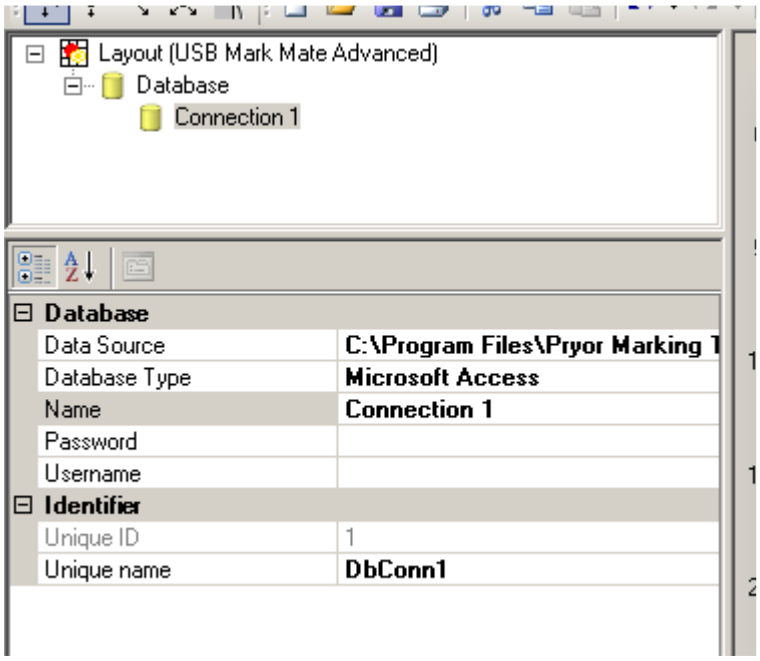
Supported Databases at Version 1.11.

- Microsoft Excel Speadsheets (*.xls)
- Microsoft Access Databases (*.mdb)
- SQL Server
- MySQL

There are 4 layout objects which relate to the database connectivity features.

Connection Object

The connection object can be inserted into a layout by selecting Insert->Database->Connection from the menu. This adds the Connection object to the layout.



The connection object is used to tell the software which database to connect to and where the database is located. It is possible to have multiple connections to multiple types of database in a single layout if required.

Database Type – The first action when configuring the software is to select what type of database the software is connecting to. This property has a pull down box showing the supported database types.

Data Source – This is the location of the database file or server. If using Access or Excel files use the browse button to find the location of the file when the Data Source property is selected.

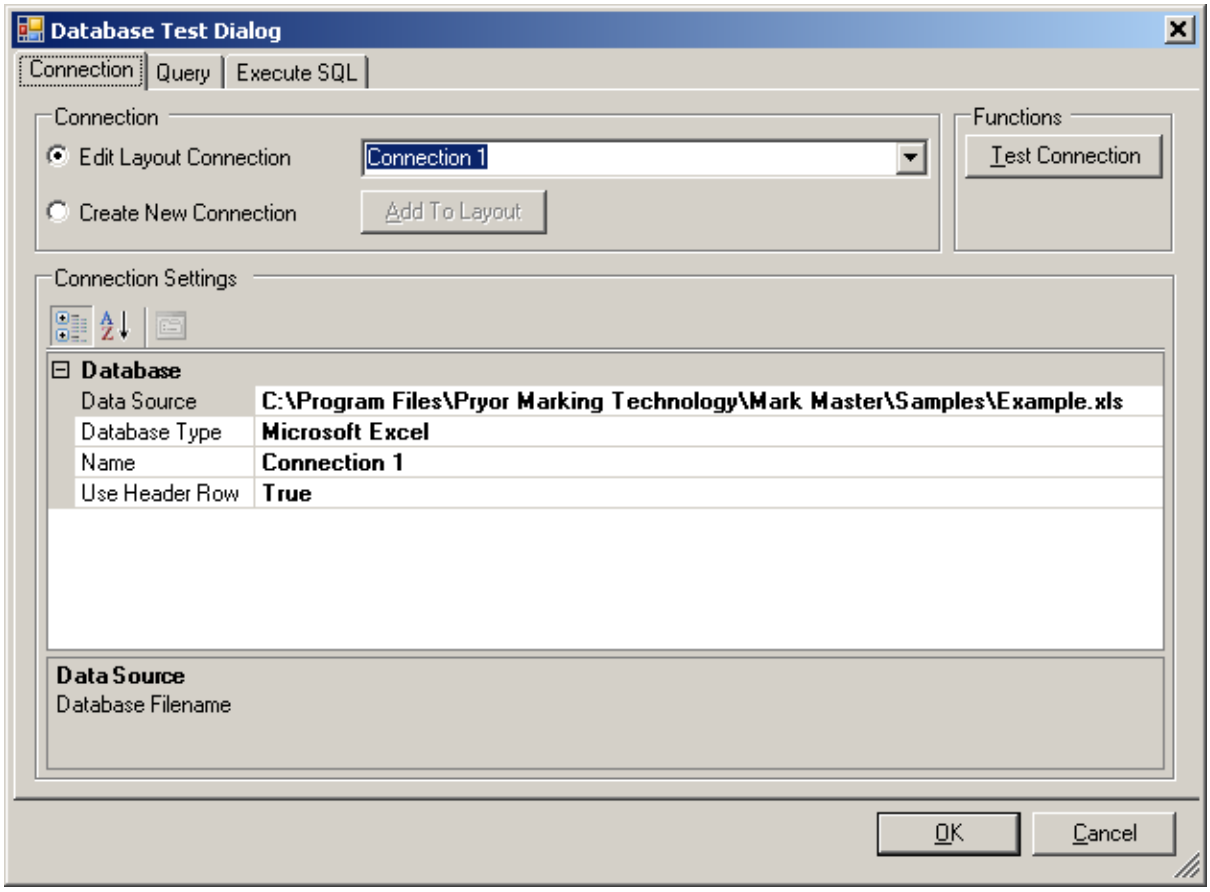
Name – The default name is ‘Connection 1’. This is simply the name used to define the connection. It is used when querying the database and can be useful if connecting to multiple databases. If only connecting to a single database then you can leave this name ‘Connection 1’.

Password & User Name – If the database file is security protected then enter the username and password in these properties. Otherwise leave blank.

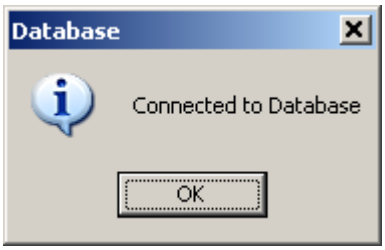
Use Header Row – If connecting to an Excel spreadsheet the ‘Use Header Row’ should be used to define the names of the columns in the spreadsheet. In the example xls file on the following page ‘Serial’, ‘Data’ and ‘Marked’ are all on the Header row and will be used in any Queries to that spreadsheet. It is therefore important to format all excel spreadsheets to have the column names on the top row of the spreadsheet.

Unique ID and Unique name – These properties are used by external programs and do not need to be modified.

Using the Database Test Dialog to test the connection.
The Database Test Dialog is a useful tool to diagnose and test any database connections. To open the dialog select Tools->Database Test Dialog from the menu.

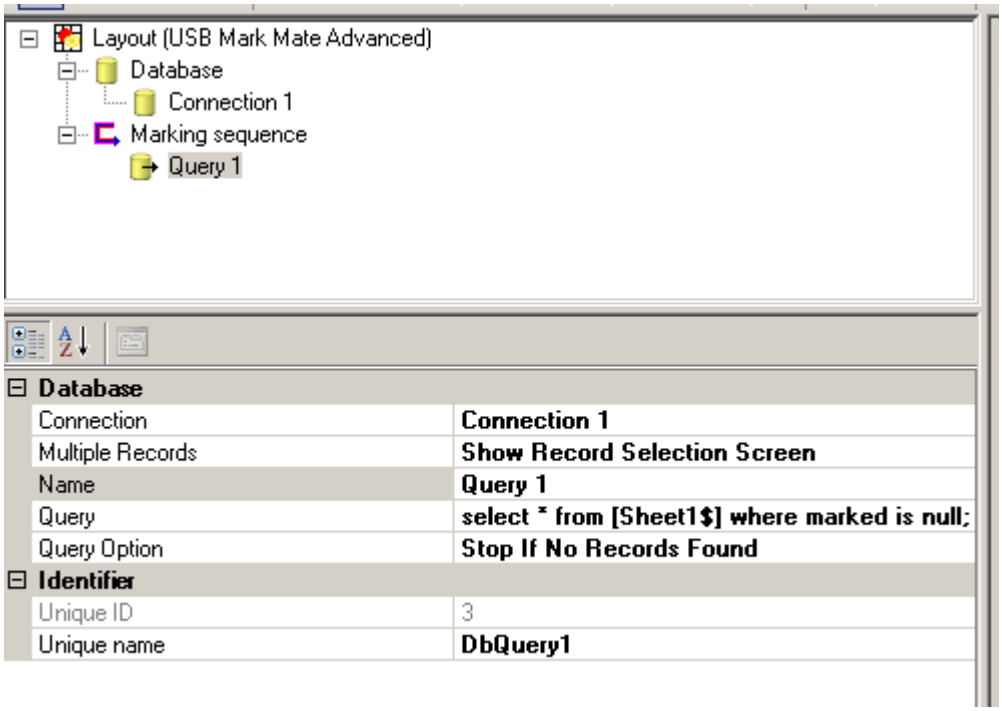


The same connection properties described previously are displayed on the Connection tab. The connection can be tested by clicking the 'Test Connection' button. If successful the following message is displayed.



Query Object

The Query object can be inserted into the layout by selecting Insert->Database->Query from the menu. This adds the Query to the layout.



The Query object is used to get data from the database. It uses standard SQL (structured query language) statements to retrieve the data. SQL is a very powerful language, this manual will cover just the basics such as returning data from an Access or Excel table. For further in depth knowledge of SQL see…

http://www.geocities.com/SiliconValley/Vista/2207/sql1.html

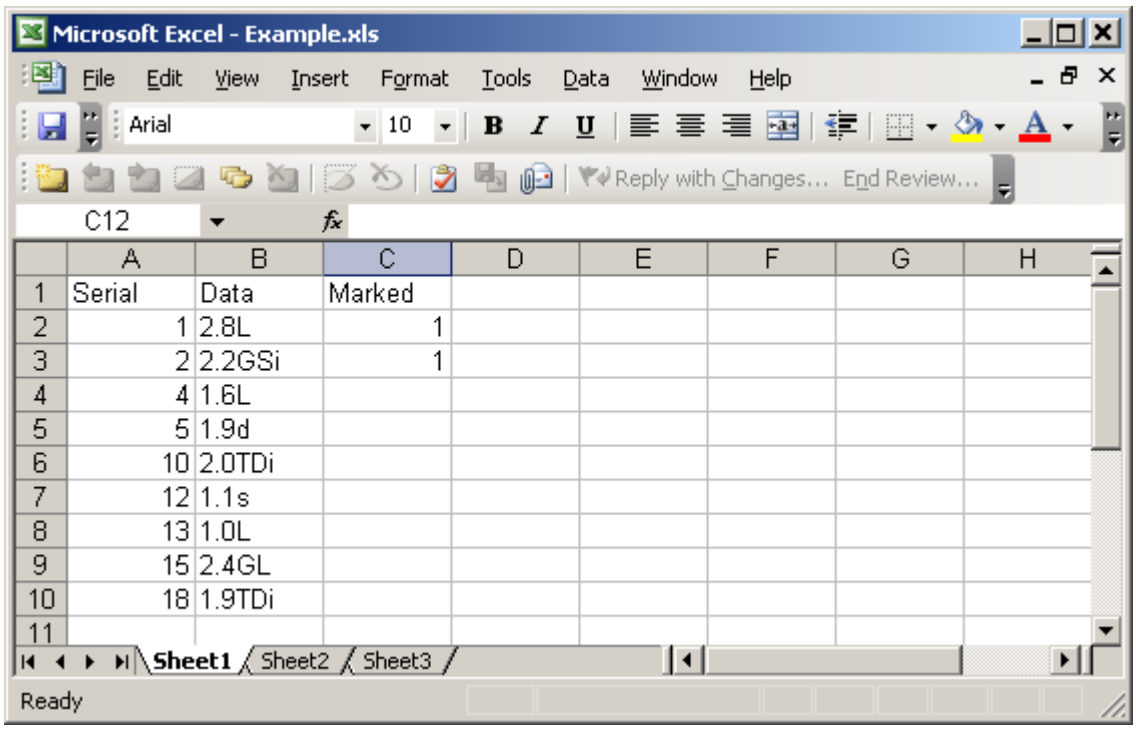
Connection – This is a drop down box allowing you to select which connection you are querying. You should have already created a connection before adding a query to the layout. In the example above the 'Connection 1' connection has been used.

Multiple Records – This is a drop down box allowing you to define what happens when a query to a database produces multiple results. It is possible to 'Use the First

Record' or 'Show Record Selection Screen'. If showing the record selection screen then all returned records are displayed on screen and the user can select which record is to be marked. A typical application may be to display all records of the days production which have not already been marked. The user can then select the next priority job from all jobs available, rather than marking each job in sequence, as would be the case if 'Use first record' was selected.

Name – This is the name given to the query. This name will be used when linking marking objects, such as text to be marked in the layout to the records returned from a specific query. The default name is 'Query 1'. It is possible to have multiple queries in a single layout. If this is the case then each query will need a different name.

Query – This is where the query is defined. An SQL statement should be inserted here. Each statement will be specific to the database being queried and the data required from the database. In the example above the query is searching for all records from an Excel spreadsheet with a sheet name of Sheet1 which have not already been marked. Below is an example of the excel file.



	A	B	C	D	E	F	G	H
1	Serial	Data	Marked					
2	1	2.8L	1					
3	2	2.2GSi	1					
4	4	1.6L						
5	5	1.9d						
6	10	2.0TDi						
7	12	1.1s						
8	13	1.0L						
9	15	2.4GL						
10	18	1.9TDi						
11								

```
Select * from [Sheet1$] where Marked is null;
```

Select – Everything; from – Sheet1 in spreadsheet; where – Marked column; is equal to – empty

This query would return 7 records from the above excel spreadsheet as the first 2 records have a value in the Marked column.

Query Option – This is a drop down box with 2 options. ‘Stop if no Records Found’ and ‘Stop if Records Found’. If you are querying for data to be marked then this options should be set to ‘Stop if no records found’. If, however, you are performing a duplicate check to see if a serial number has already been marked then you should set this to ‘Stop if records found’.

Unique ID and Unique name – These properties are used by external programs and do not need to be modified.

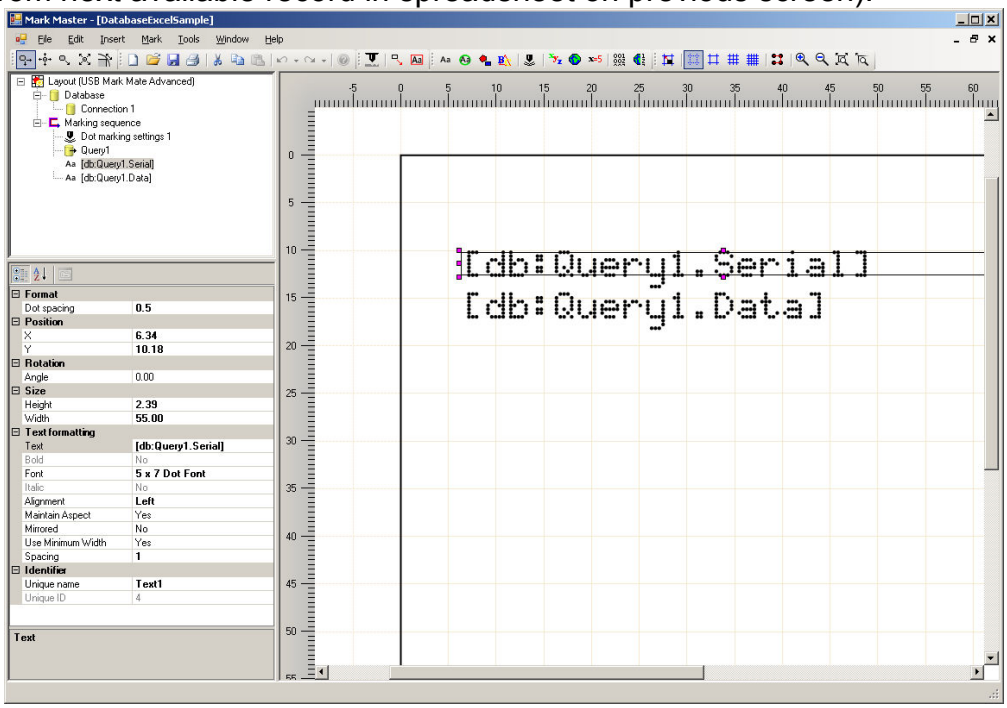
Marking the Query Results

The query will return data from the spreadsheet or database. To actually mark the data returned it is necessary to link the text object in the layout to the database query results. This is achieved by setting the mark text to a database link command. For example if we wish to mark the Serial Number and Data fields from the above excel file and we have used the Query called Query1 above we must set the text on our 2 text objects to…

Text Object 1 = [db:Query1.Serial]

Text Object 2 = [db:Query1.Data]

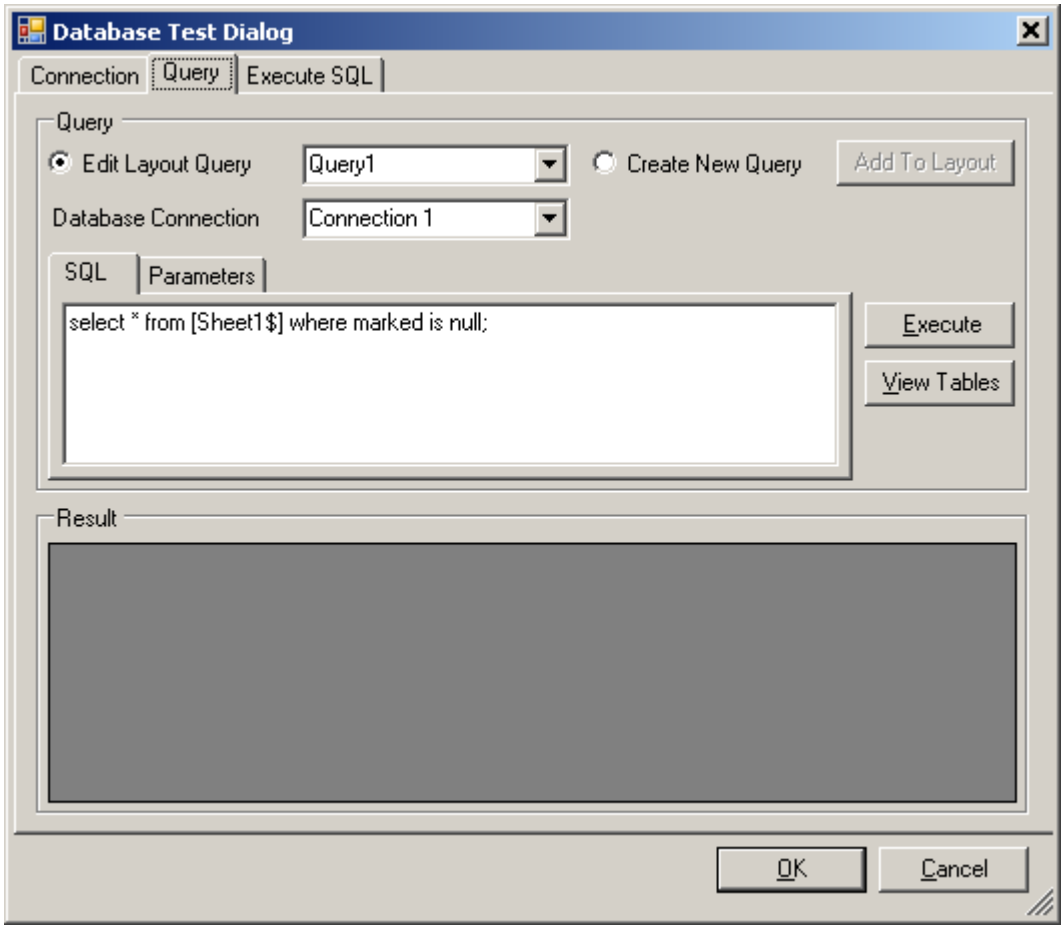
Text Object 1 will mark the returned data from the Serial column in the spreadsheet (e.g. ‘4’ from next available record in spreadsheet on previous screen) and Text Object 2 will mark the returned data from the Data column in the spreadsheet (e.g. ‘1.6L’ from next available record in spreadsheet on previous screen).



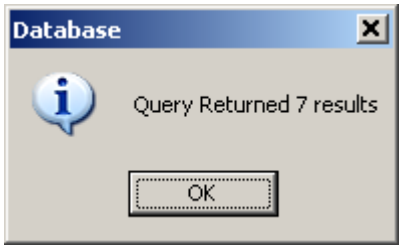
When the layout is marked the software will execute the query and replace the text in the layout with the results of the query.

Using the Database Test Dialog to test the Query

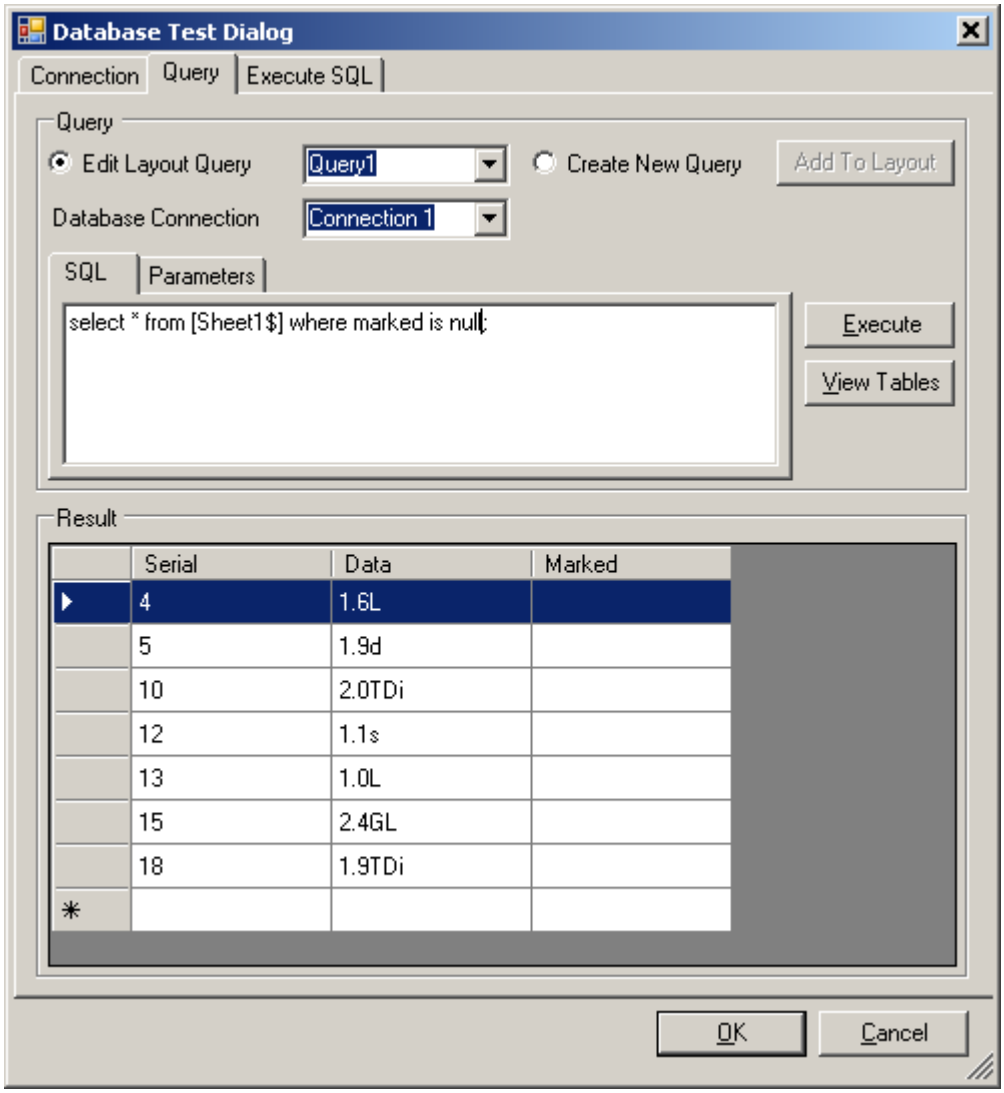
The database test dialog is a useful tool to test the SQL syntax and view the records returned from a database. Select Tools->Database Test Dialog from the menu and select the Query tab.



The SQL statement is displayed. In the example above the software will select all unmarked records from Sheet1 of the excel spreadsheet. Click Execute and the SQL statement will run. If successful a message box will display how many records have been returned.



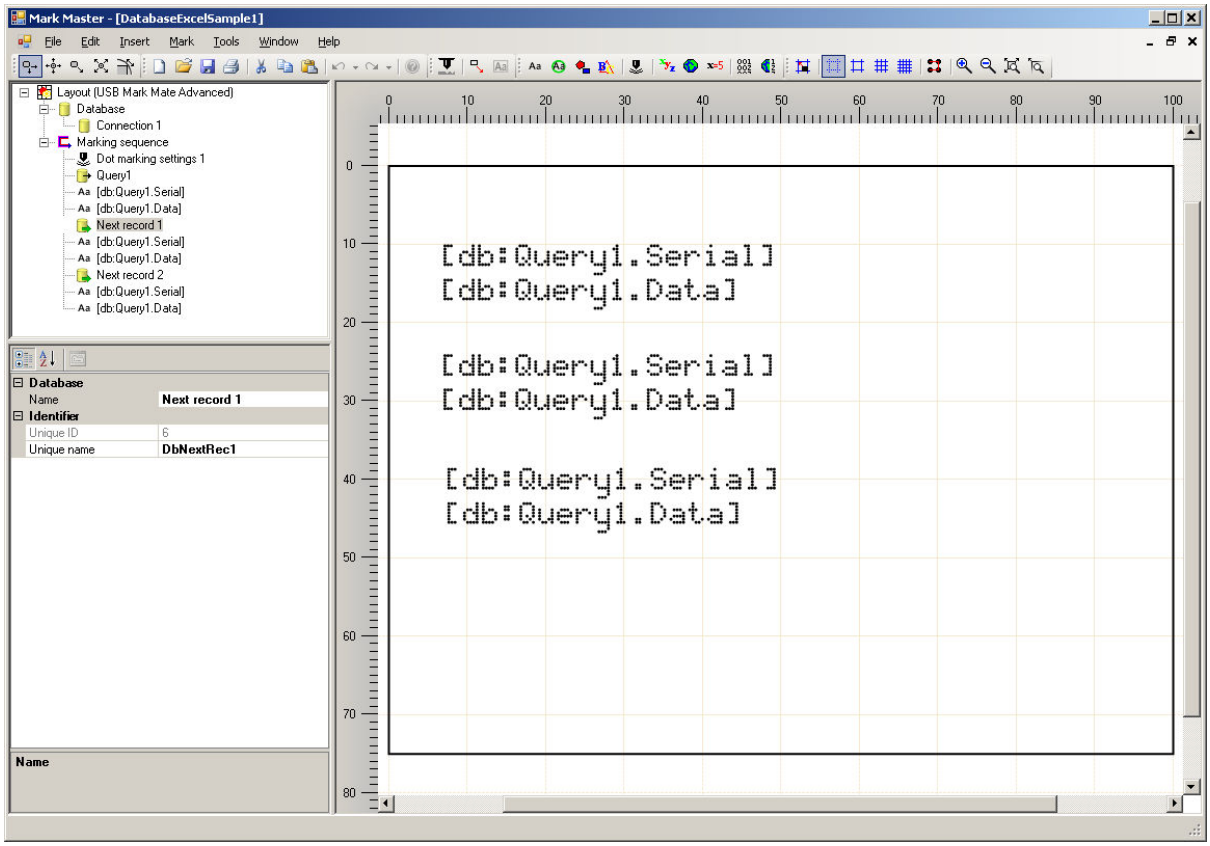
Click OK and the results will be displayed on the Database Test Dialog as below.



This proves that the SQL statement is correct and that the results are the 7 unmarked records from the total 9 records in the spreadsheet shown on the previous pages.

Next Record Object

The next record object is useful when multiple records are returned and multiple parts are marked in a single layout. For example if 3 components of the above example are to be marked at the same time. Then adding a next record object between text objects will cause the software to take the next record of any multiples returned and apply the results to the next text objects. See the screen below, notice the 2 next record objects in the marking sequence.



Based on the excel spreadsheet example on the previous pages this will mark

4
1.6L

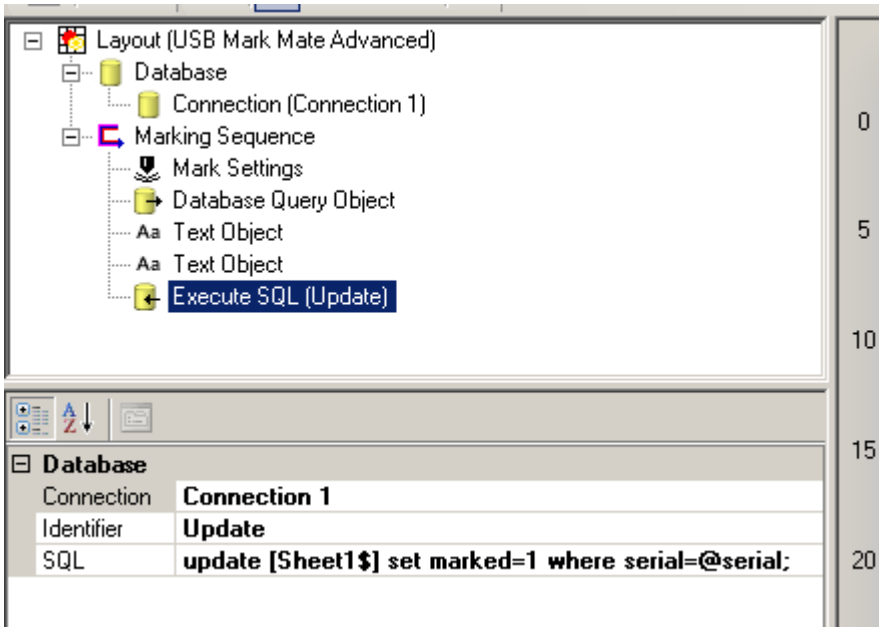
5
1.9d

10
2.0TDi

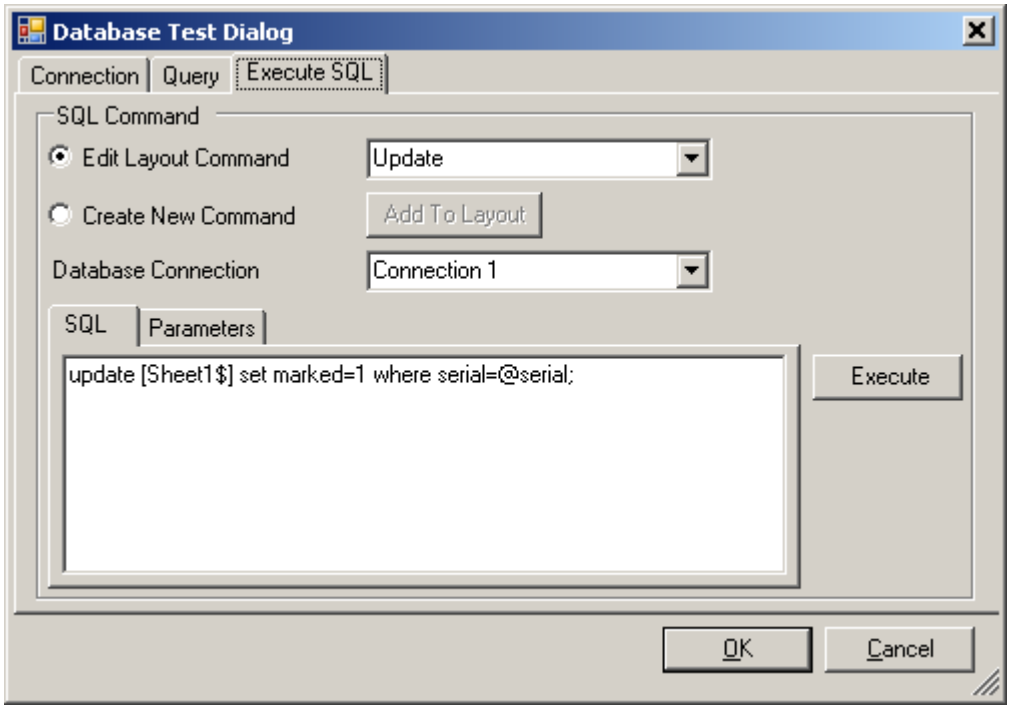
Execute SQL Object

The Execute SQL object allows an SQL statement to be executed at any stage of the marking process. This feature is most useful for writing data back to a database using the 'Update' SQL command. To add the Execute SQL object to the layout select Insert->Database->Execute SQL from the menu.

In the example below the Execute SQL object is used to write back to the database that the record has been marked. This, combined with the previous Query object which checks if it has been previously marked, prevents the same record being marked twice.



It is recommended that you use the Database Test Dialog when adding 'Execute SQL' objects to the layout. Once the object has been added to the layout open the Database Test Dialog from the Tools menu.



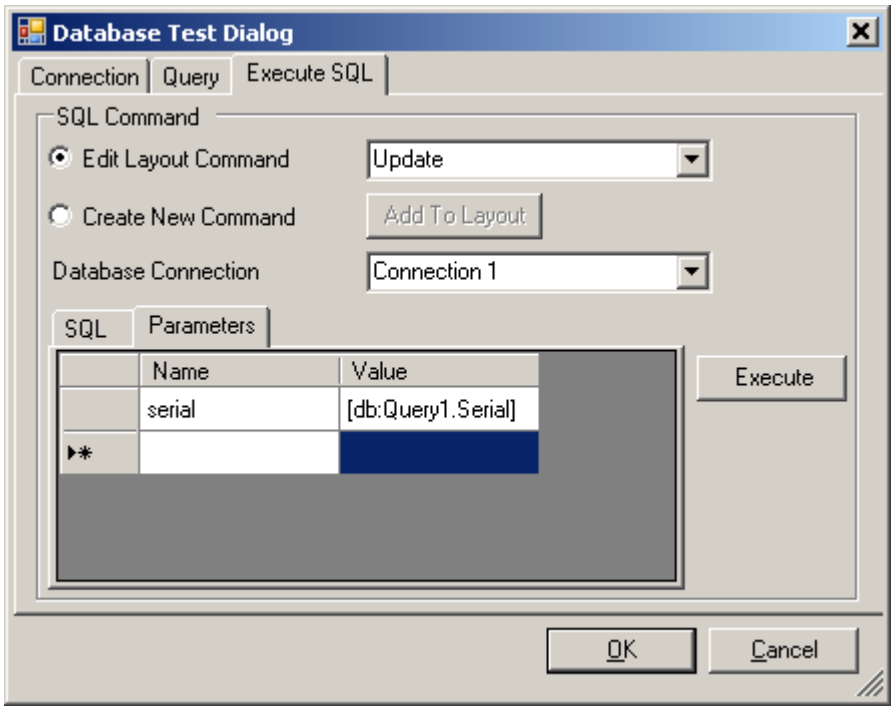
This update command will write back to the database a value of '1' to Sheet1 of the excel spreadsheet on the adjacent column called Marked where the Serial column matches the serial data just marked (like the serial values 1 and 2 in the excel file featured on the previous pages).

update [Sheet1$] set marked=1 where serial=@serial;

Update Database Sheet1 in Spreadsheet — Write Back a '1' to Marked column — Where Serial column is equal to last query

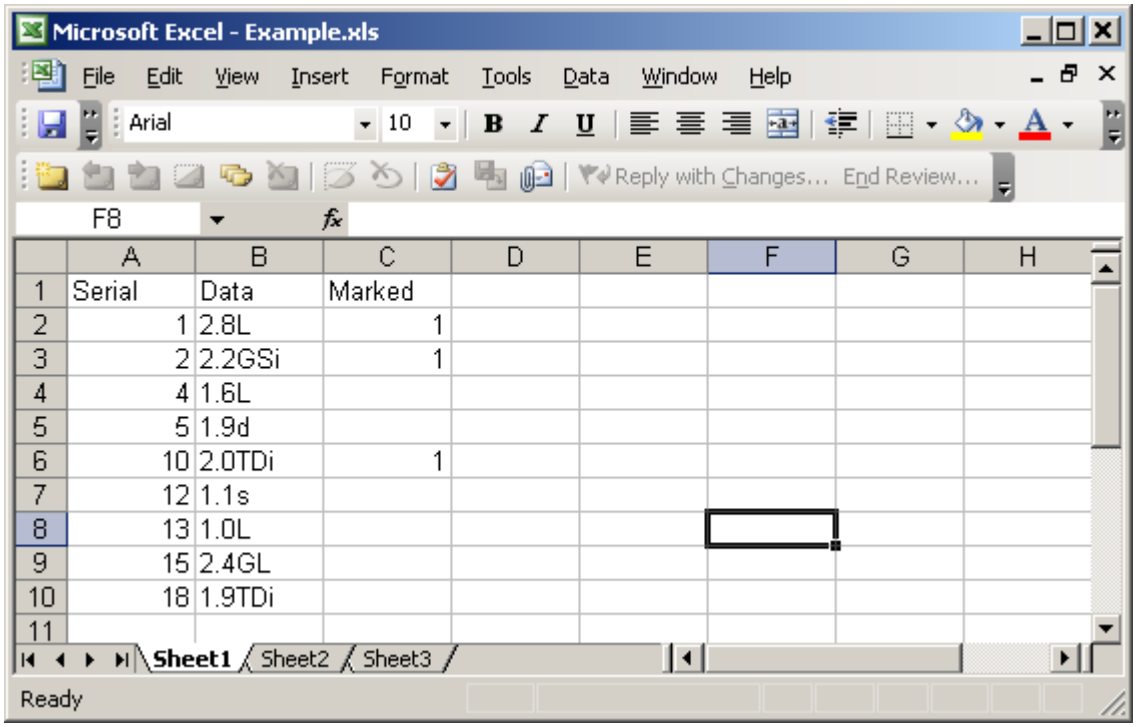
This example only wants to write back to the record which has been marked. To do this we have chosen a unique field in the database. In this case it is the Serial column (all numbers are unique). We only want to write back to the record where the Serial value in the spreadsheet matches the Serial value just marked. To do this we need to create a parameter to feed into the SQL statement. This is where the @ character is used.

To add parameters click on the Parameters tab on the Database Test Dialog.



In the example above the serial parameter has been given the value [db:Query1.Serial]. This is the same value as the marked text object. It is therefore assigning whatever was marked on the layout to the 'serial' parameter. This parameter can now be fed into the SQL statement by adding an @ character to the beginning of its name as in the example above.

Using the Database Test Dialog it is possible to Execute the SQL statement to test if it is correct. In the case above the [db:Query1.Serial] value is unknown because this query has not yet taken place. So to test this, replace it with a known value eg 10. Then press execute. The spreadsheet now has a 1 written against the 10 serial number in the Marked column.



	A	B	C	D	E	F	G	H
1	Serial	Data	Marked					
2	1	2.8L	1					
3	2	2.2GSi	1					
4	4	1.6L						
5	5	1.9d						
6	10	2.0TDi	1					
7	12	1.1s						
8	13	1.0L						
9	15	2.4GL						
10	18	1.9TDi						
11								

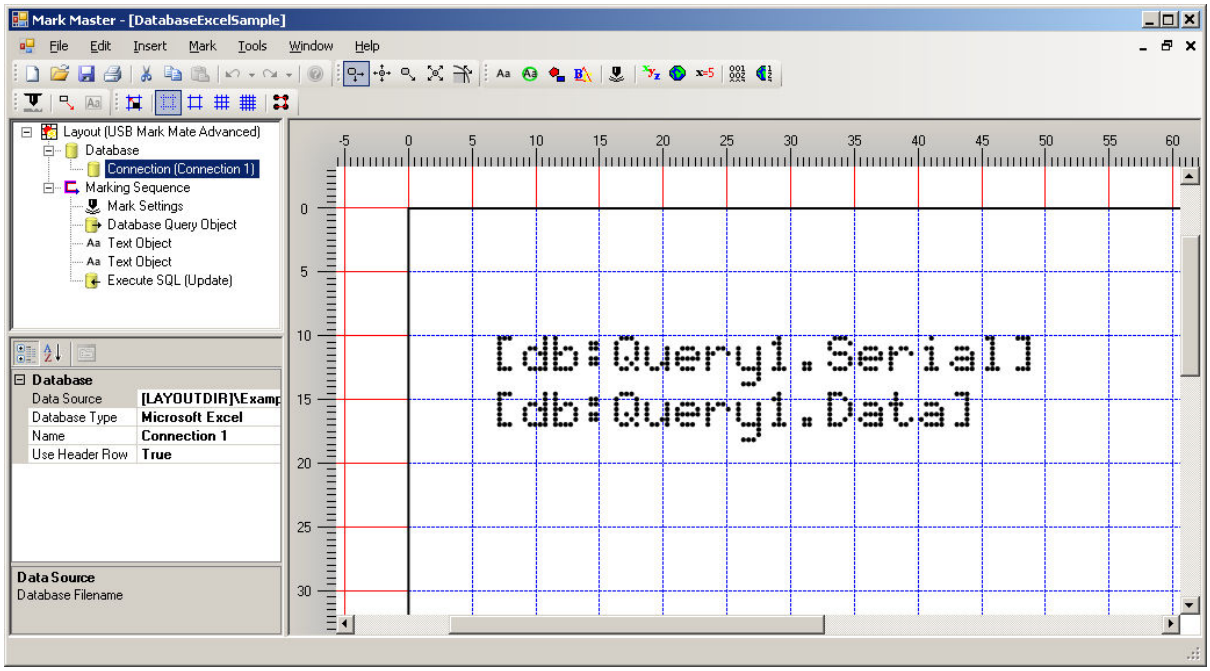
Sample Database Files

The MarkMaster software installation program also installs some sample layouts and sample database files to illustrate the Database features. The files are located at the path.

C:\Program Files\Pryor Marking Technology\MarkMaster\Samples

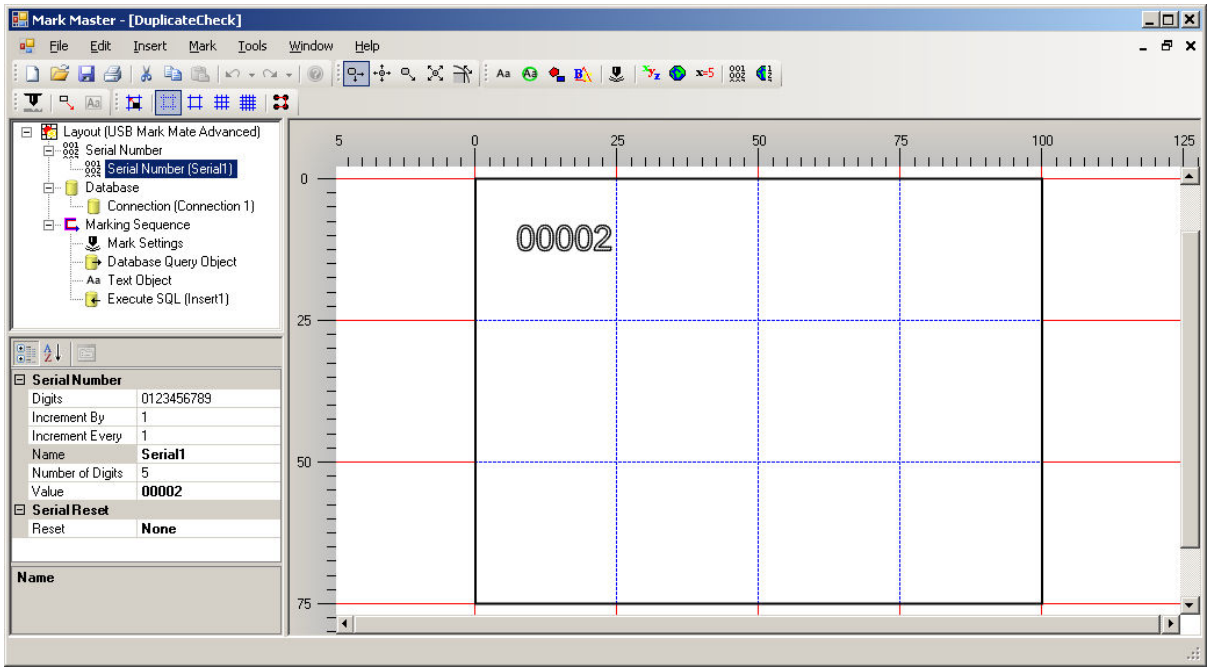
DatabaseExcelSample Sample Layout

The DatabaseExcelSample file connects to the Example.xls file also located in the Samples folder. This layout will start at the top of the excel spreadsheet and mark each entry one at a time until all entries have been marked. This example file makes use of the Connection, Query and Execute SQL objects. Experiment with the Multiple Records property on the Query object with this sample.



DuplicateCheck Sample Layout

The DuplicateCheck layout marks an automatically counting serial number. The database features are used to search the database to see if the number has already been marked. If the number is found in the database an error message is displayed and the mark is prevented. If the mark is successful the layout will write the marked serial number and time/date stamp to the database to prevent it being marked again. This example uses an Access database called Sample.mdb with a table name called DuplicateCheck. Note: It does not need to be an automatically counting serial number which is duplicate checked. The layout could easily be modified so this value is manually entered.

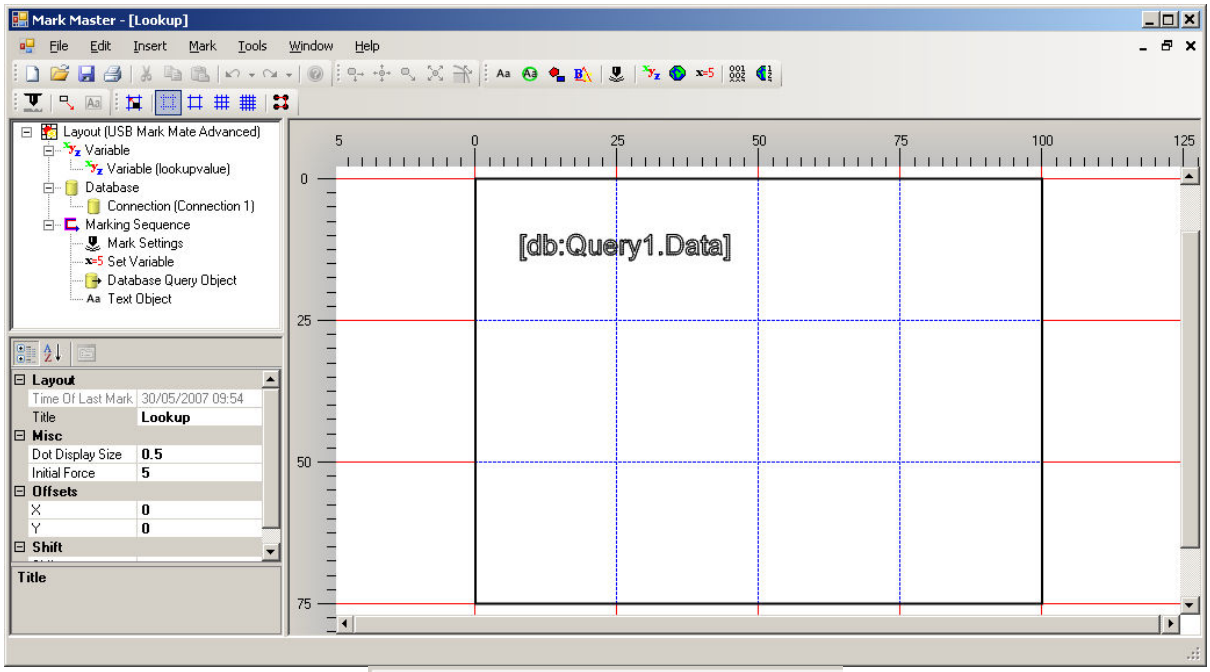


DuplicateCheck : Table

	serialNumber	markedTime
	1	30/05/2007 09:58:43
▶	3	30/05/2007 10:03:30
*	0	

Lookup Sample

The Lookup sample layout connects to an Access database called Sample.mdb. When the layout is marked the user is prompted to enter a value between 1 & 10. When the value is entered the Query object searches for the entered value in the Value column of Lookup table in the database. It then returns a single record which is linked to the text object in the layout and is ultimately marked. This is a good example of database searching based on a user input. Pay attention to the Parameter tab on the Query tab of the Database Test Dialog.



Lookup : Table

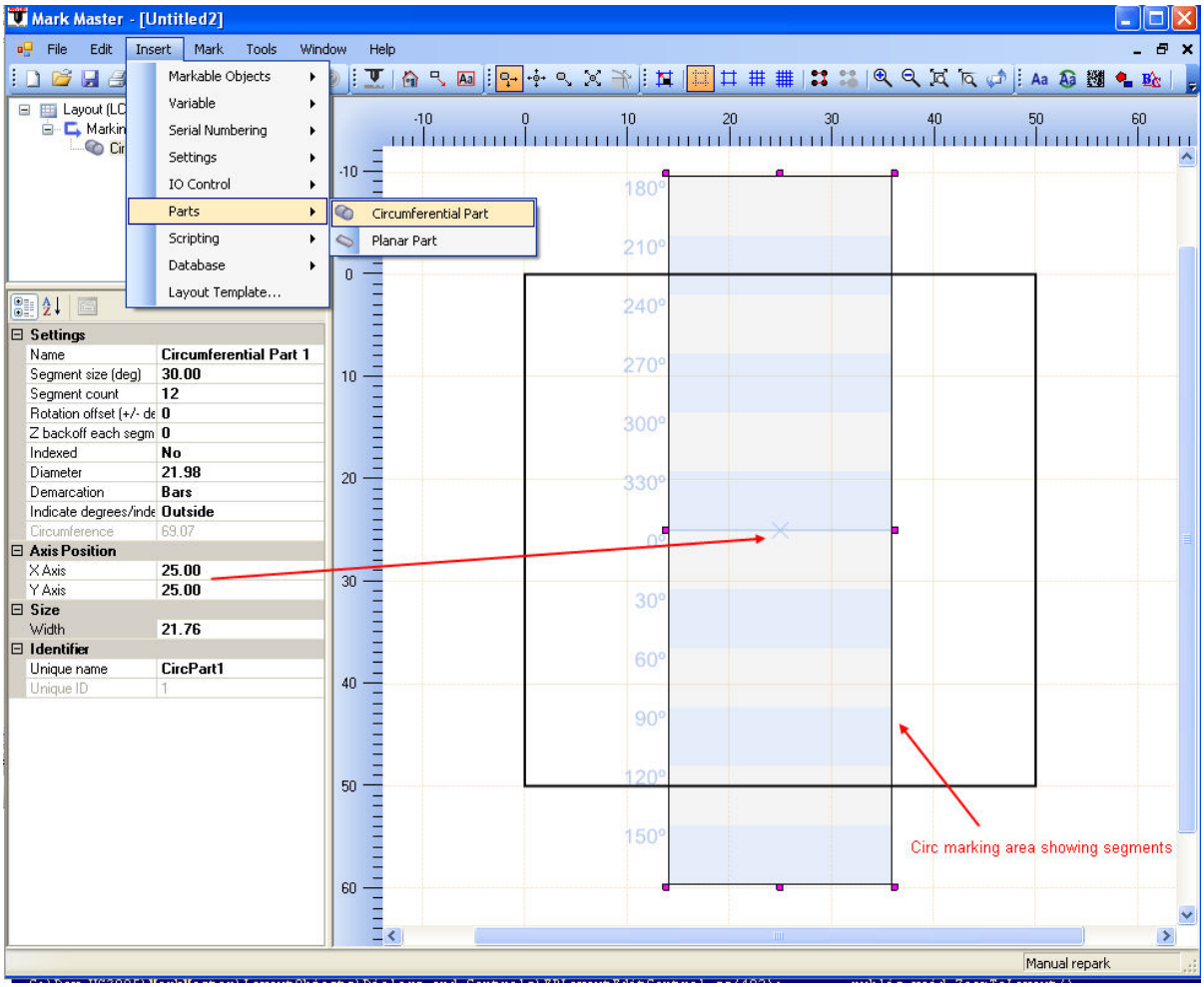
	Value	Data
▶	1	Data 1
	2	Data 2
	3	Data 3
	4	Data 4
	5	Data 5
	6	Data 6
	7	Data 7
	8	Data 8
	9	Data 9
	10	Data 10
*	0	

SECTION 9
CIRCUMFERTIAL MARKING

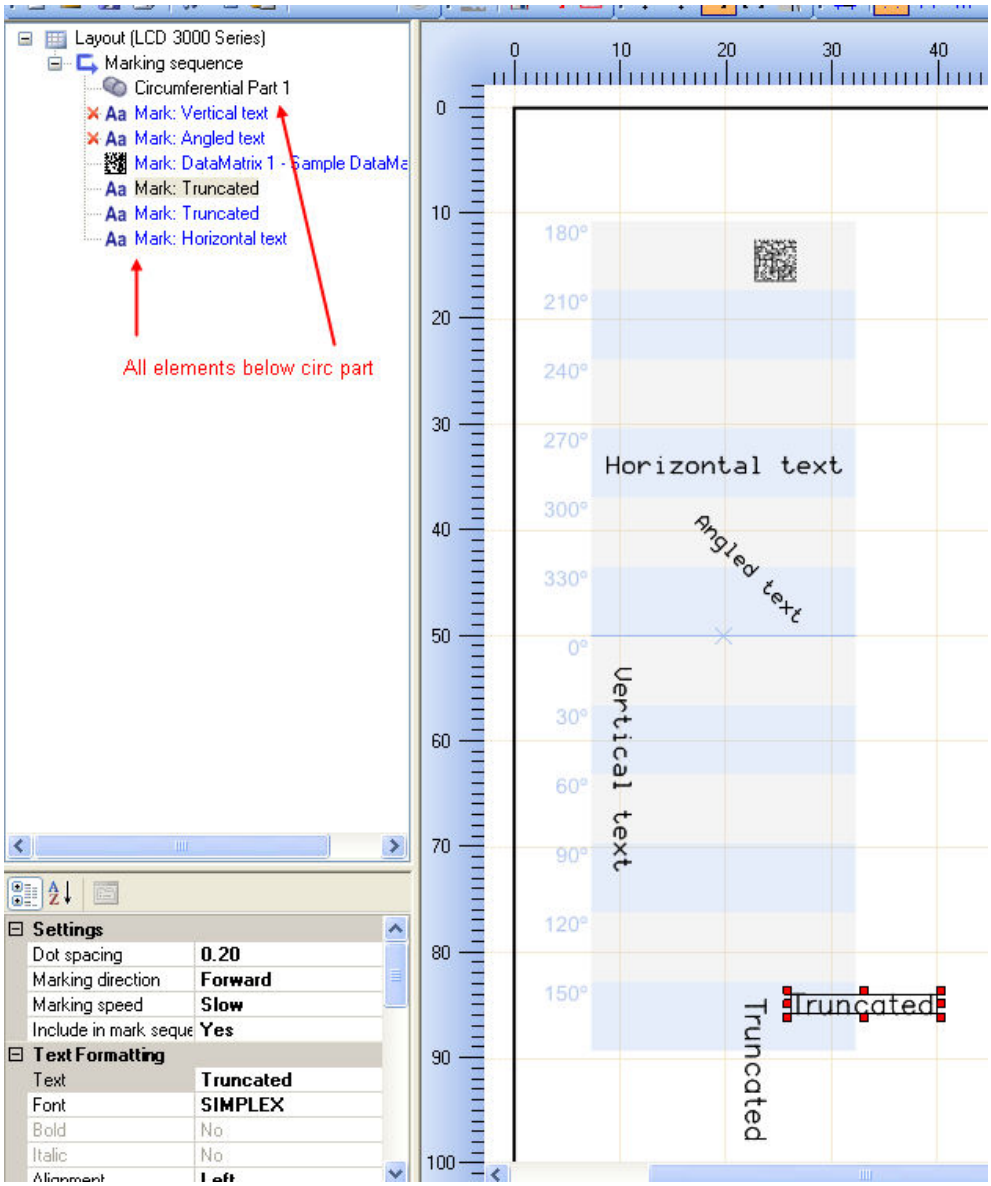
If attached, the circ axis fixture device settings can be accessed and enabled via Mark, Device Settings. Elements are marked on a circ axis by overlaying a marking area on top of a standard layout, as shown below

The circ marking area is shown as a series of blue and grey bands, representing the individual marking areas that the marking head will cover. The head will effectively mark the first segment, 0-30º, then reposition itself as the circ rotates to the 30º-60º segment, mark that, etc. Hence the representation on screen is of the surface of the cylinder being marked – imagine peeling off the label wrapping a tin can and laying it flat. For this reason it can extend outside the apparent layout boundary, as can be seen below.

The circ area can be selected and dragged around the layout. This simulates moving the circ fixture around the marker base plate. A part with numerous diameters can be marked by adding a number of circ marking areas next to each other (working to the right) and setting their diameters accordingly.



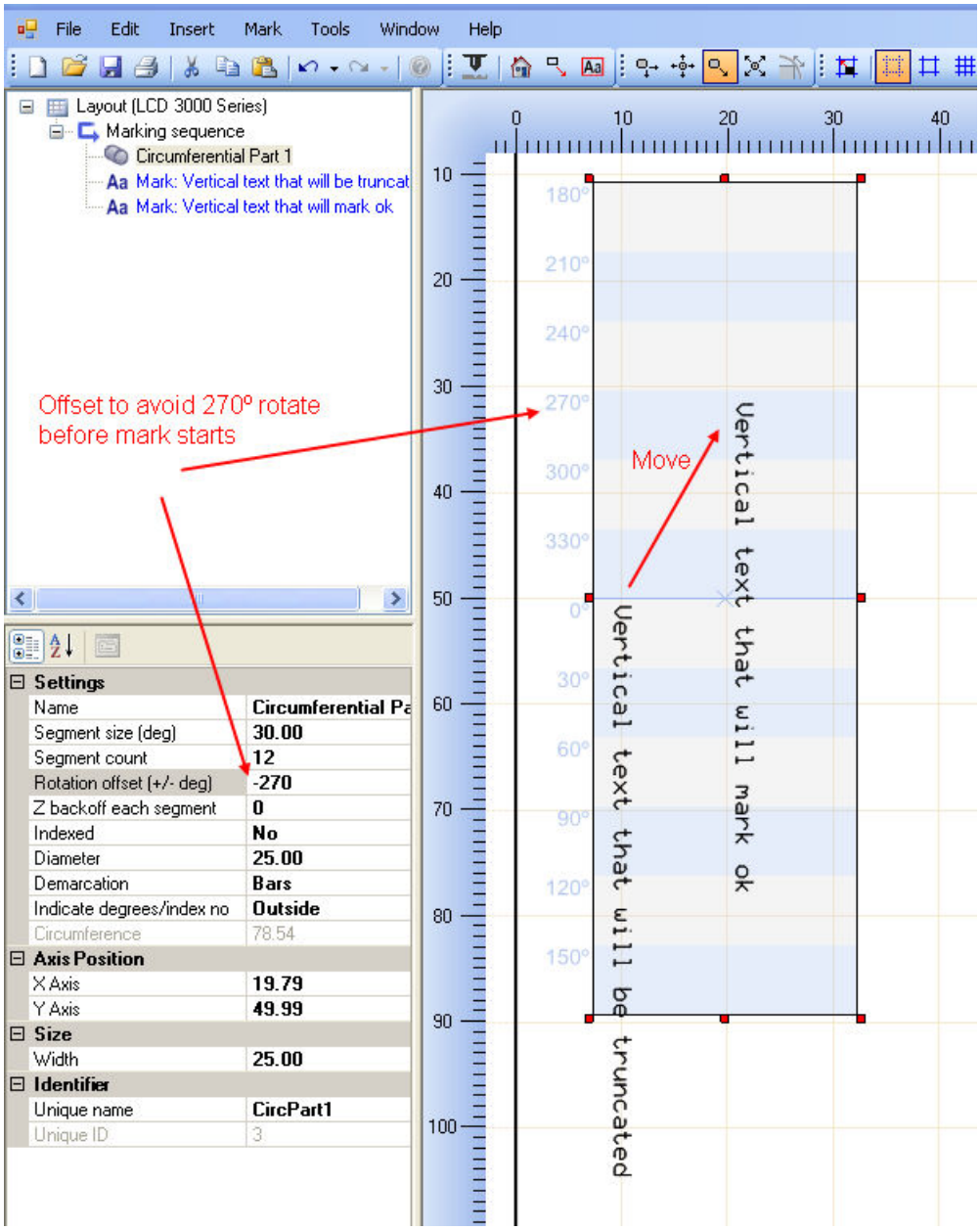
All standard elements can be added to the circ layout area as shown in the example below. It is important that the marked element sits below the circ part in the marking sequence or they will be treated as standard flat part marks. Also the element should not extend outside the circ marking area. The two elements marked ‘Truncated’ will be.



It is important to note that marking will start from the 0º position, so in the example above, the 'Vertical text' mark will be made first. As the circ rotates, the two 'Truncated's will be marked, then the Data Matrix at the top etc

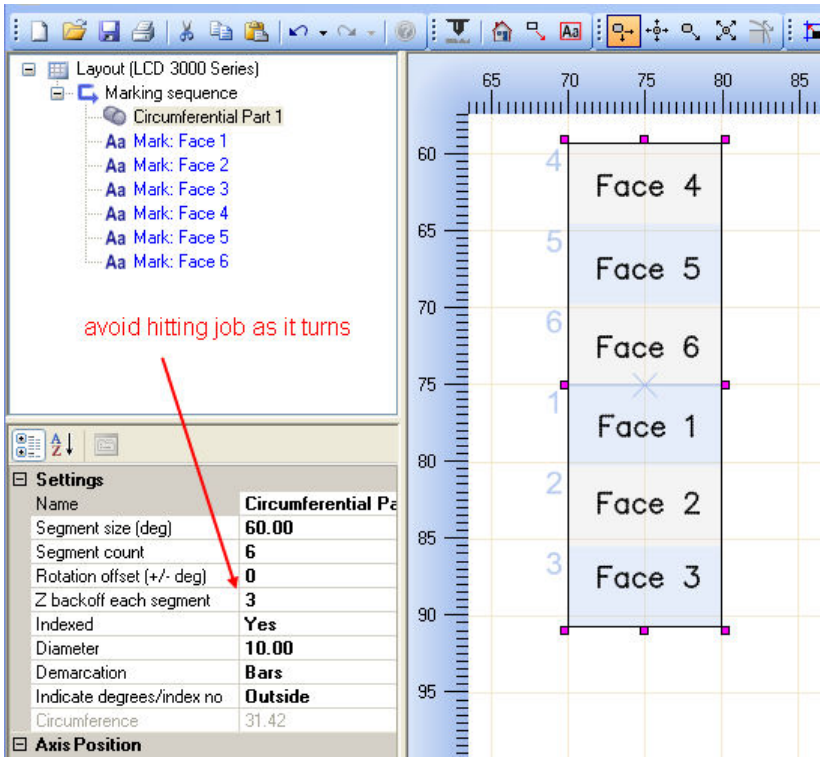
The example below shows how to handle a long string of text that ideally starts from the 0º point for fastest marking. As the text will not fit, it must be moved 'up' the circ part to fit, leaving its start point around 270º. On marking, the circ would rotate through ¾ of a turn before starting, then mark through approx 180º as the text was marked. At best this is slow, at worst it could run up against a proxy that disallows marking past 360º.

A rotational offset can be applied to allow for this. In the example, the text will start at 270º so an offset of -270º has been applied to negate this. Marking will begin at the 0º position.



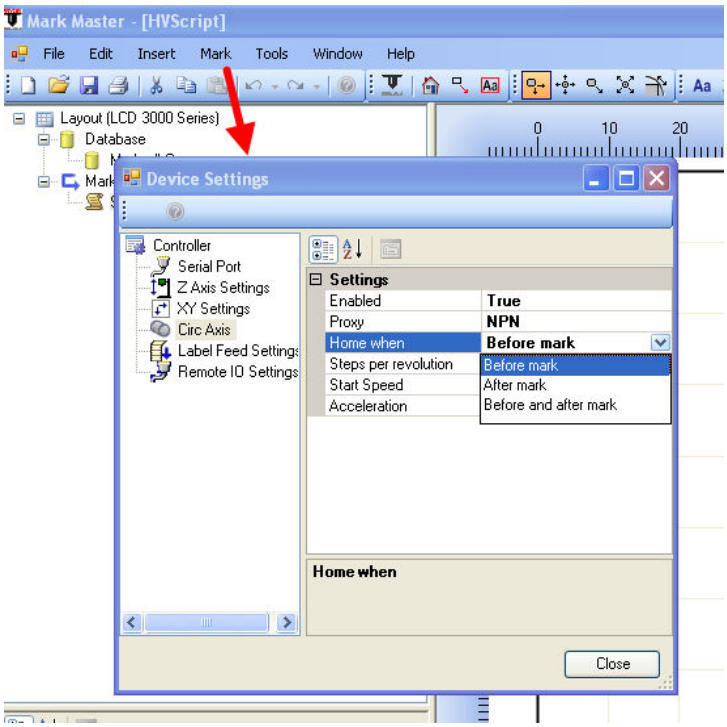
Indexed marking

The examples above assume a smooth circular part. To mark items with flats, such as nuts, indexed marking can be used. The example below has indexing turned on and is marking a 6 faced part. A 3mm Z backoff has been applied that will lift the head away from the job as it rotates, to avoid hitting the face edges as the nut rotates.

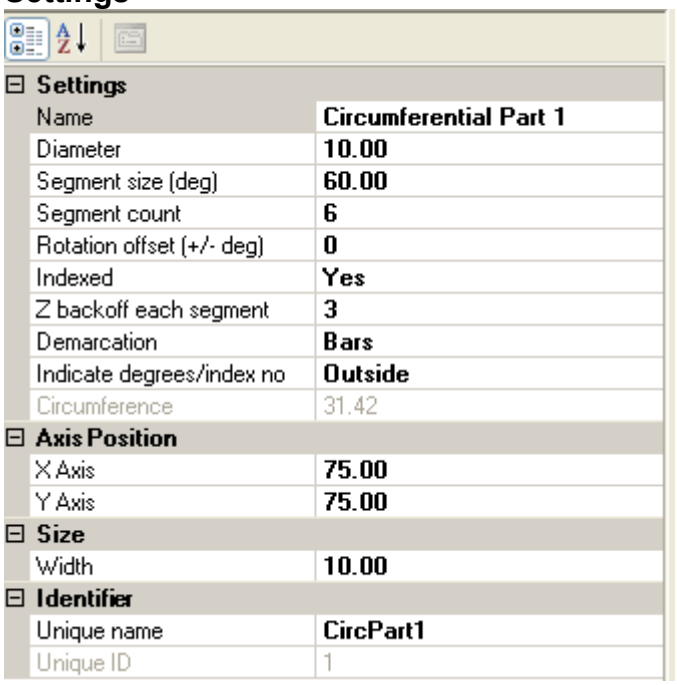


Axis homing

The circ can be set to home before, after or both before and after the mark, if a proxy is enabled.



Settings



Settings	
Name	Circumferential Part 1
Diameter	10.00
Segment size (deg)	60.00
Segment count	6
Rotation offset (+/- deg)	0
Indexed	Yes
Z backoff each segment	3
Demarcation	Bars
Indicate degrees/index no	Outside
Circumference	31.42
Axis Position	
X Axis	75.00
Y Axis	75.00
Size	
Width	10.00
Identifier	
Unique name	CircPart1
Unique ID	1

Name
Appears in the layout, doesn't have to be unique but is advisable

Diameter
Of the part to be marked

Segment size (deg) / Segment count
Related, setting one will amend the other. Limited to max of 200 segments (1.8º)

Rotation offset (+/- deg)
Fastest marking will always be achieved when the marked elements are positioned at or near 0º. If this is not possible, setting this will reposition the effective start point as explained in the example above

Indexed
Turn on to mark parts with flats, such as nuts

Z backoff each segment
Lifts the head to clear any edges when turning a nut for example

Demarcation / Indicate degrees/index no
Allows user control over how the circ part marking area looks on screen

X Axis / Y Axis
The centre point of the circ marking area on screen. Marked with a small blue cross

Width
The width of the circ marking area on screen, which will probably be matched with the part to be marked (or a significant portion of it)

SECTION 10
RS232 CABLE DETAILS