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1. Introduction

Only authorized personnel may switch the machine ON. Before running the software, the operator must therefore be authorized to operate and run the KC5 machine.

It is important to read this software manual carefully before using the software to operate the Key Cutting Machine. This will ensure proper use of the system and prevent possible accidents during work or maintenance.

As Mul-T-Lock Technologies Ltd. continuously develops its software and machines to their maximum potential, this manual, though completely up-to-date when issued, is subject to future changes.

The software version is indicated in the manual.

The KC5 Key Cutting Machine can be operated with this software. This software can be run on a PC connected to a KC5 Key Cutting Machine.

General: the software enables the locksmith to operate all the manual functions of the machine in computerized mode through a user-friendly interface (HMI – Human Machine Interface). In addition, it enables more operation functions, such as building batch files, editing existing files, using MASTERpiece files to cut keys for master key systems, marking keys, machine maintenance, and upgrading the software.

We highly recommend that you read this manual in full color print or on screen. To read a PDF file, download Acrobat® Reader or Foxit® Reader (Acrobat and Foxit are trademarks).

Refer to <http://www.foxitsoftware.com/downloads/> to download.

Note: this software cannot run if the PC is not connected to a turned ON KC5 machine. The software is not a Master file editor.

Introduction

Introduction

1.1. Translation into user's language

After receiving the machine from Mul-T-Lock Technologies Ltd., the user can contact Mul-T-Lock's Marketing Communication Department and ask for permission to translate this manual into the user's language.

When the translation has been completed, the user must return the translated copy as a Word file (*.doc), and if possible, provide an additional copy in PDF file format.

1.2. File extensions used by this software

The software uses different types of files. All files have a name and extension. The structure of the file name is as follows: name.ext

In this book, files appear as *.ext. Only the extension names are important, and the user can select the file name.

Update: *.out, *.xtc, *.xtl

Batch: *.csv

Master: *.exk or *.exx Master files generated by Mul-T-Lock Ltd. MASTERpiece software

Marking (Engraving): The Icon is a *.dxf file. The drawing files can be generated by AutoCAD®, Solidworks®, or a similar CAD program (AutoCAD and Solidworks are trademarks).

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2. Safety notice

2.1. Safety notes in this manual

The following safety notations are used in this manual:



CAUTION

Operating procedures, practices and conditions must be strictly observed to prevent equipment damage or destruction.



WARNING

Operating procedures, practices and conditions must be strictly followed to prevent personnel injury or death.

It is therefore essential to read this manual carefully before proceeding with start-up, use, maintenance, running or any other software or machine jobs.

The machine is equipped with all the safety devices necessary to ensure risk-free use under standard conditions.

Software installation, maintenance and adjustment must be carried out in observance of all safety standards and in observance of all the precautions deemed applicable for each task.

The operator must be qualified, have expert machine knowledge, and must have read this manual.

Extreme care must be taken to ensure a constant operator safety standard.

We advise strict observance of the work safety standard as defined by the relevant authorities in each country, region or nation.

The manufacturer cannot accept responsibility for damage to persons or objects resulting from noncompliance with safety standards.

Safety notice

2.2. Safety notes for machine use



WARNING

The user must comply with the following safety rules and procedures:

- Observe **CAUTION** and **WARNING** notices posted on the machine and safety notes in this software manual and/or the machine manual.
- Only qualified personnel may operate the machine and/or perform maintenance on the machine. Operating personnel must not remove covers or panels.
- Do not start the machine or software system if any safety cover is missing.
- Ensure that all control panels and electrical panels are covered.
- While carrying out maintenance on the system, post highly visible warning signs.
- Before switching the system **ON**, the operator must examine the machine, undertaking the following steps:
 - Perform a visual examination of the system's components (e.g. ensure that the equipment is properly placed, view any messages on the display screen, etc.)
 - Verify that the system is not undergoing maintenance.
- The operator must always directly check that emergency commands are operating perfectly.
- When the machine is in use, do not leave the machine unattended, except in cases where this is allowed.
- During a pause in the work cycle, switch the machine **OFF**. During a prolonged pause, turn the main switch **OFF**.
- The machine may stop during work cycle for any number of reasons. Whenever this happens and the situation requires access to the inside area containing electrical equipment, always set the main switch **OFF**, or unplug the main electrical lead or cable.
- The protective door is attached to a safety sensor, which does not allow the door to open while the machine is in operation. The door can only be opened after machine has stopped operating.
- Never try to open the door or a cover when machine is switched ON.

MOVING PARTS – Moving parts may bruise and cut the operator.

Safety notice

WARNING

Keep away from moving parts.

- Do not wear rings, wristwatches or other jewelry while working on live electrical circuitry.
- Do not permit smoking or food in the work area.
- Close and secure the safety door after completing set-up, troubleshooting and maintenance procedures.
- Report any unsafe conditions to the supervisor.
- Secure electrical wires and cables to prevent damage.
- Ensure that all personnel know where the main power and emergency switch are located, and how to react in case of an electrical emergency.
- Locate approved types of fire extinguishers near the equipment.
- Arrange the material to be worked in a rational manner, so as not to hinder the work cycle.

2.3. Safety notes concerning maintenance

WARNING

- Do not allow unauthorized personnel to carry out repair or maintenance tasks.
- Read the machine's user manual carefully before starting the machine or carrying out machine maintenance tasks.
- To avoid being trapped in moving parts, do not repair or adjust the machine while it is in operation, unless expressly stipulated in the machine's user manual.
- Stop the machine according to the procedures laid down in the machine manual and maintenance manual before cleaning or carrying out other tasks.
- Do not use matches, cigarette lighters or torches as a means of lighting during work on the machine.

3. Software installation

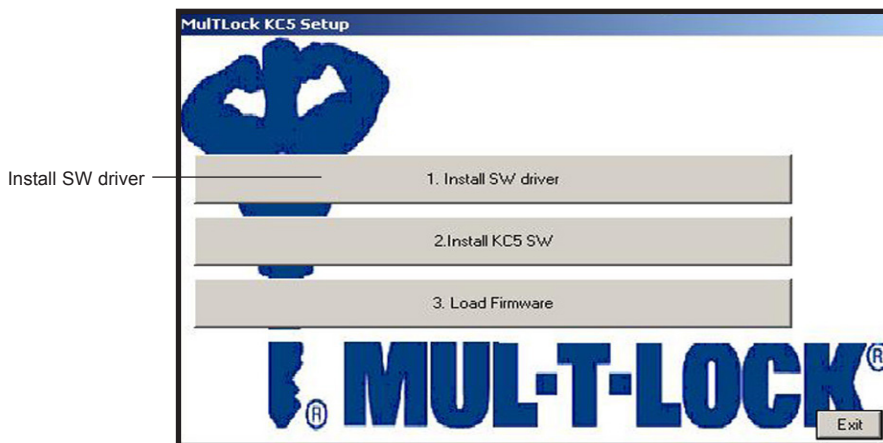
3.1. System requirements

Minimum system requirements:

1. PC with operating system XP (SP1), Vista, Win7. All 32 or 64 bits
2. PC internet connection. During installation the SW will look for Microsoft® .NET framework 3.5 or higher. If not found, it will need to download it from the internet. This is especially relevant for old XP platforms.
3. Screen resolution of 1024x768

Note: verify that the KC5 machine is connected to the computer and switched ON.

Unzip the installation package and run setup launch.



To start the installation click on **1. Install SW driver**



Click **Next** to continue

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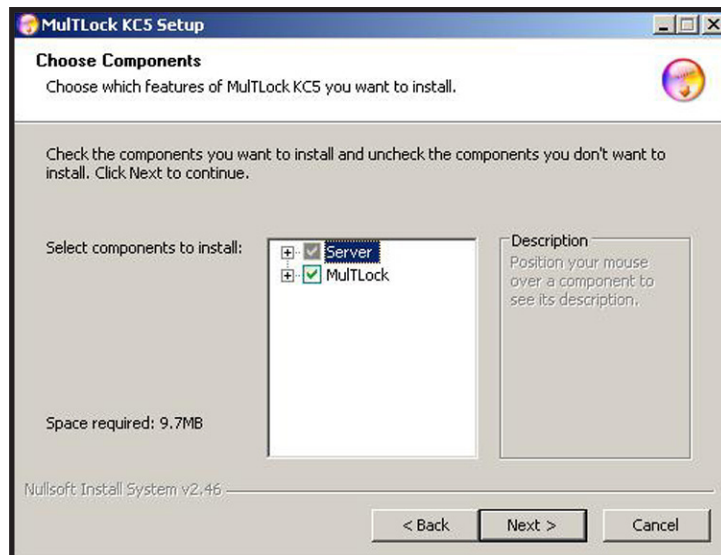
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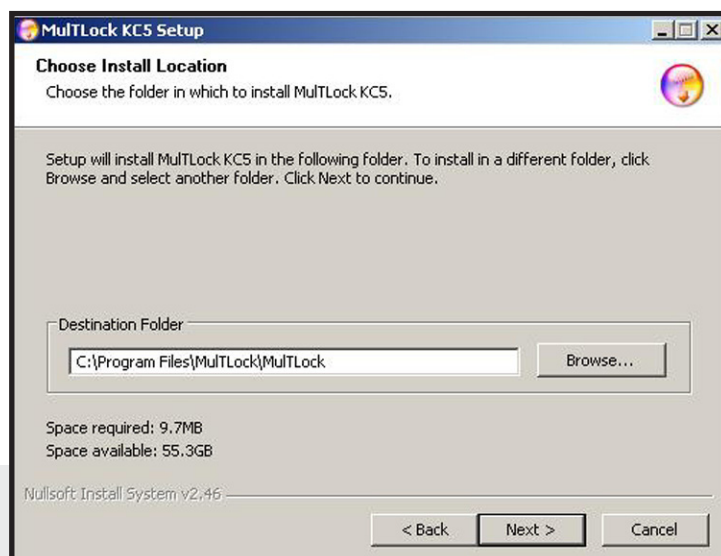
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Select components to be installed. Click **Next** to continue.

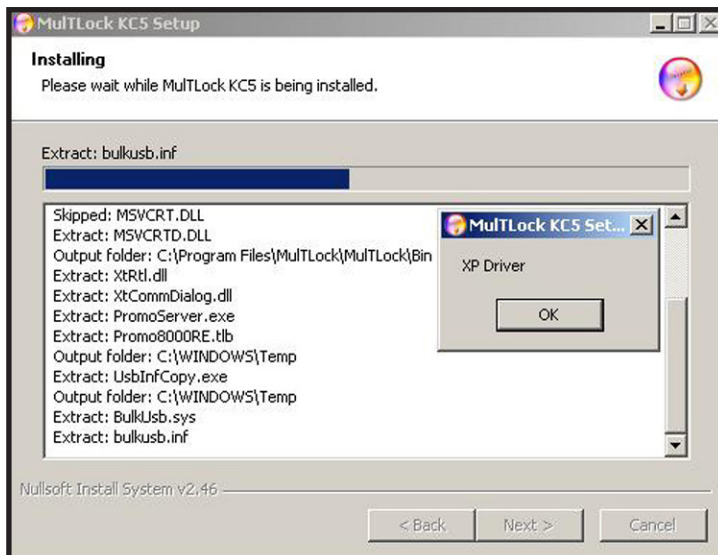


Use the default location or browse for a different location for the installation. Click **Next** to continue.



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The installation wizard will indicate the Windows platform it is installing to. Click **OK** to continue.



When done click **Next**. To complete the installation process you need to restart your computer.



Click **Finish** to reboot.

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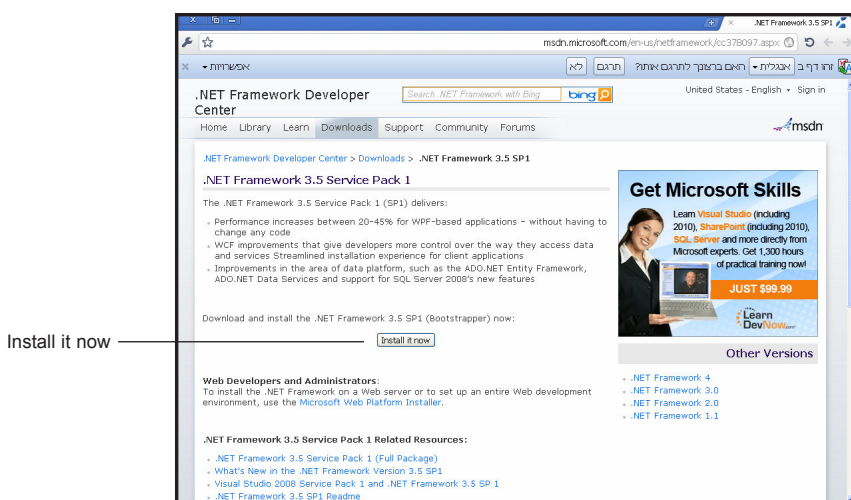
Software installation

3.2 Microsoft®.NET Framework installation

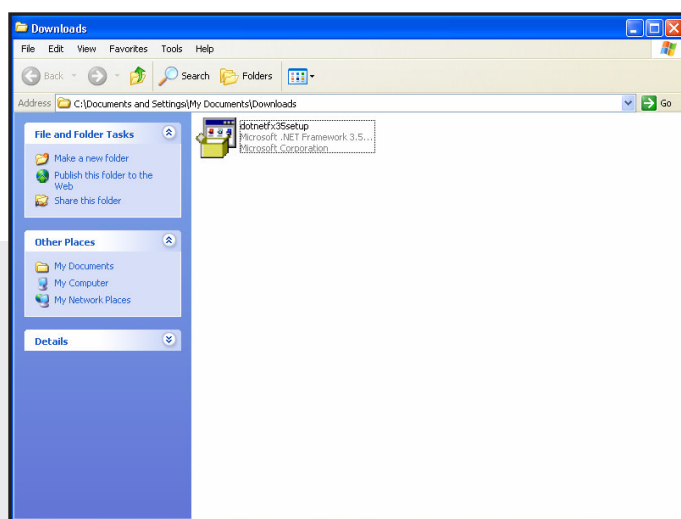
Note: the installation requires Microsoft® .NET 3.5 Framework. If not found, it will connect to the internet to download the SW from Microsoft® website.

Microsoft® .NET Framework software will be installed automatically. If this process does not start automatically, the Microsoft® .NET Framework can be downloaded from the Microsoft® website at the following link: <http://msdn.microsoft.com/en-us/netframework/cc378097.aspx>

Click **Install it now** to download the software setup.



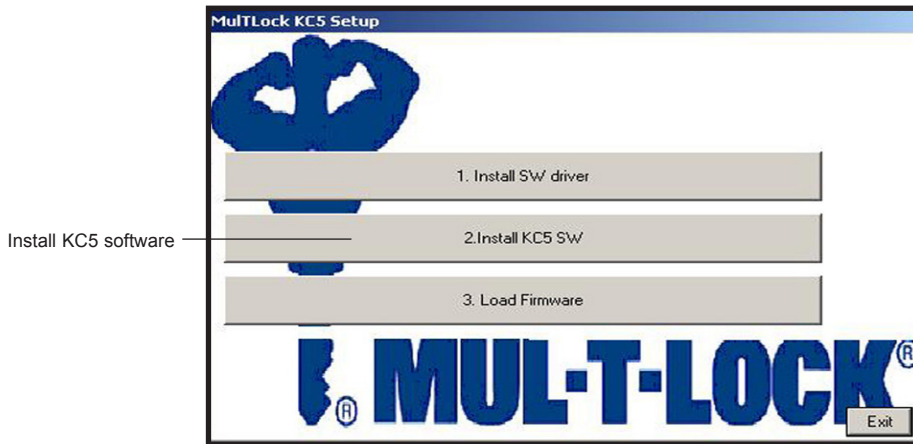
When you click on the **Install it now** button the setup file will be downloaded to the PC at the default folder location: C:\Documents and Settings\My Documents\Downloads.



Click on the setup file and follow the on-screen instructions.

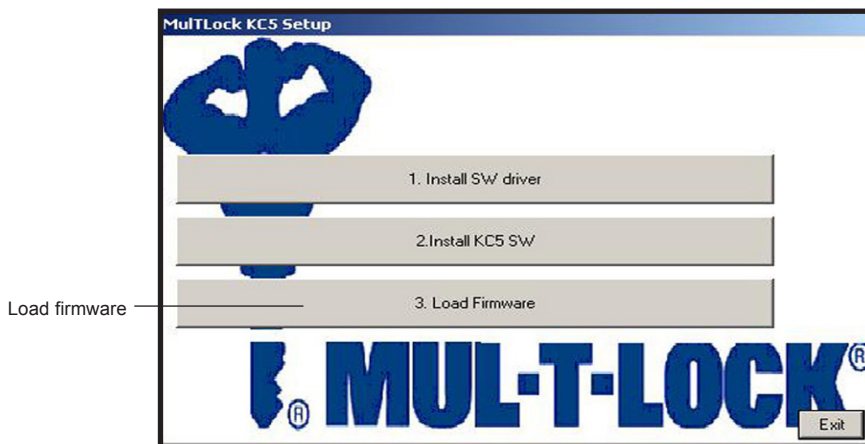
Software installation

Run setup launch. Click **2. Install KC5 SW**



Follow the on-screen instructions. When installation is done 2 new icons will be added to your desktop, KC5 and Loading utility.

Run setup launch. Click **3. Load firmware**



This process will upload the required firmware version onto your KC5 machine. Once done, your system is ready to start the new SW.

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4. Running the software

The software can run when a PC is connected to the KC5 machine, and the machine is switched ON (see the machine operation manual).

4.1 Setting language

To set up the preferred language double click on the **Loading utility** icon on the desktop. Select your preferred language, click on **Set** and close the utility.

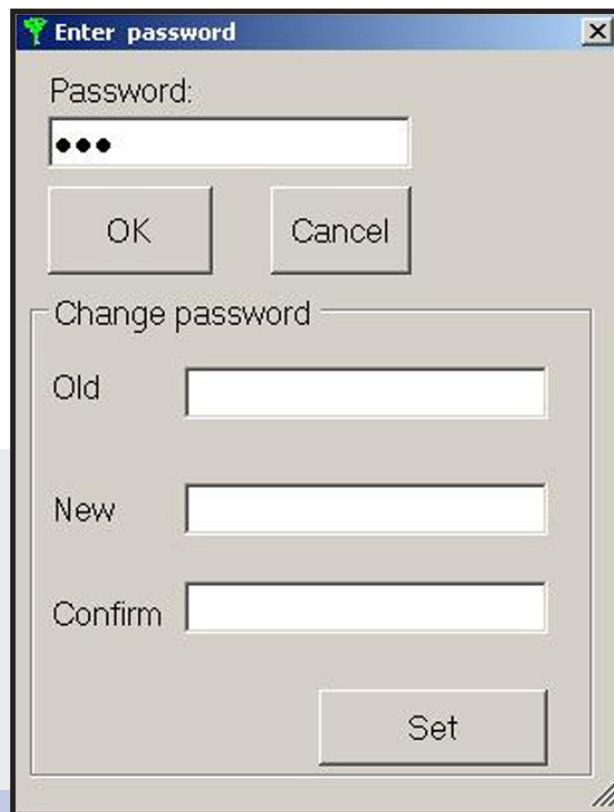
4.2 Starting the software

Double click on the **Starting** icon on the desktop.



Note: the default password is kc5. This password can be changed later.

4.3 Changing password

A screenshot of a Windows-style dialog box titled "Enter password". It has a standard window border with a close button (X) in the top right. The dialog contains a "Password:" label followed by a text input field with three black dots. Below this are "OK" and "Cancel" buttons. A section titled "Change password" is enclosed in a rounded rectangle and contains three text input fields labeled "Old", "New", and "Confirm". A "Set" button is located at the bottom right of this section.

5. Main screen

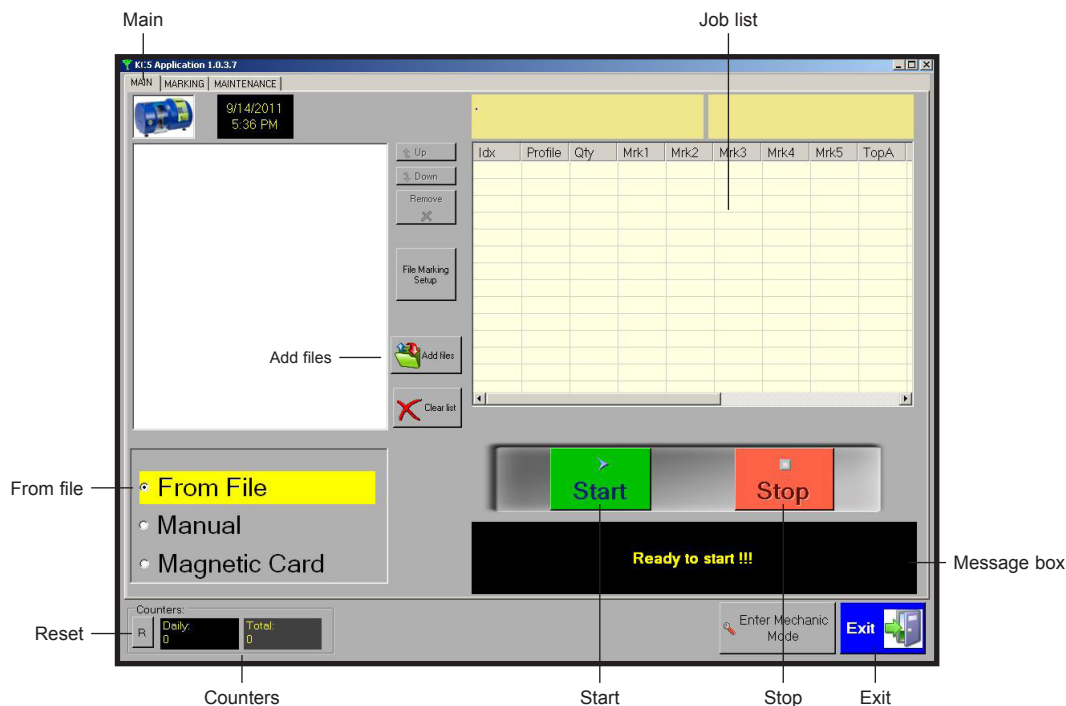


Fig 1. Main screen – general view

5.1 From file mode

This option allows the user to load master suite files generated by the Masterpiece software or files typed into the KC5 software in the **Manual** mode and saved as *.csv file format.

Add Files: open and load master file into the file queue. Click on the **Add Files** button. Select one or more *.exx files from any folder and load them into the jobs list. Files saved in the manual mode have the extension *.csv

Clear List: select this button to clear files in the queue. The *.exx files added can be seen among all the others in the queue.

Up/Down: the locksmith can change the position of a specific file in the queue, thereby changing its priority. Select the file from the list and use the up/down buttons.

Note: Only the content of the first file on the list is displayed on the right side of the screen, since this is the active file. To view other files use the up/down buttons.

Remove: select this button to remove a selected file from the job list.

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Start: once a file has been loaded the locksmith may begin to cut the keys. Select **Start** on the screen or press **Enter** on the keypad. The machine starts cutting the selected key. If no key has been selected, it begins to cut the first key in the queue. During the key cutting process, the system sends the locksmith messages through the message box. (e.g. rotate the key, select start for homing, etc.)

Stop: clicking **Stop** during the key cutting process stops the cutting of the current key.

Note: each key line is marked in yellow when done. The job file is removed from the queue automatically only when the job has been completed.

On screen information: at the top right hand corner of the screen the user can see the name of the current job and the number of keys it contains. At the bottom of the screen the user can find information about the total number of keys produced during the machine's lifetime, and the number of keys cut from the last reset.

Reset: the daily quantity can be reset by selecting the reset button **R**.

Main screen

5.2 Manual mode

When selecting **Manual**, the software opens the main screen and the screen's appearance changes:

Note: Platform screens may look different. This depends on specific KC5 authorizations.

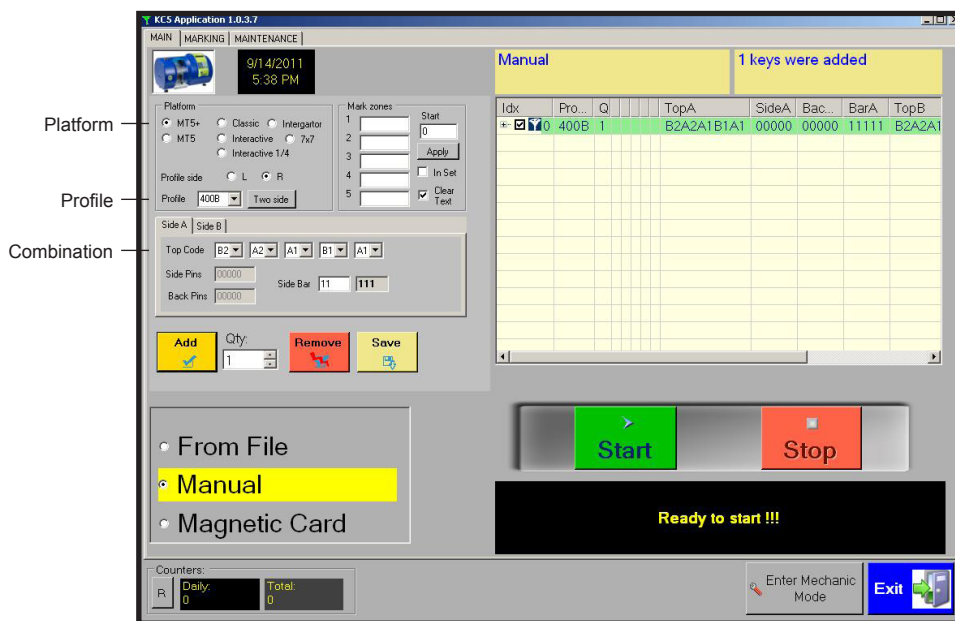


Fig 2. Main screen - manual mode

Platform: select a platform you wish to create manual entry for (i.e Classic, Interactive etc).

Profile: select right or left profile and choose the profile number from the list. You can click on **two side** to enable the entry of 2 different combinations for the 2 sides of each key (double-sided keys).

Side A/B: enter the combination from the list of combinations pack. If the profile is permitted to have side or back pins, those fields may be editable by the user. If not, they are grayed out and the user can't access them.

Add: add a line with the selected combination to the table.

Quantity: determine the number of copies from this key.

Remove: remove a line from the table.

Save: save the list of keys in the table in a *.csv file format.

Note: for loading a list in file mode, make sure the filter is set to *.csv so you will be able to find the file in the directory.

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Mark zones: when adding keys to the table, the user can place up to 5 different strings for the mark zones. Zones 1 & 2 are for one side of the key, and 3, 4 & 5 are for the other side. The mark zones are set through the marking tab.

Consecutive numbers: after adding the keys to the table, the user can give consecutive numbers to the keys. The user can mark a ~ where a consecutive number should be placed, or a * where he wants to keep the already installed text.

Example:

The user wants to produce 3 keys and 3 copies of each key. After adding the keys to the job list the table looks as shown in Fig 3.

Mark zones Start Marking

Manual 12 keys were added

Idx	Pro	Q	Mrk1	Mr	M	TopA	SideA	Bac
1	400B	1	2342	121	51	B2A2A1B1A1	00000	0000
2	400B	3	2342	121	51	B2A2B2B2A1	00000	0000
3	400B	1	2342	121	51	B2A2B2B2A1	00000	0000
4	400B	1	2342	121	51	B2A2B2B2A1	00000	0000
5	400B	1	2342	121	51	B2A2B2B2A1	00000	0000
6	400B	3	2342	121	51	B2A2D3B2B1	00000	0000
7	400B	1	2342	121	51	B2A2D3B2B1	00000	0000
8	400B	1	2342	121	51	B2A2D3B2B1	00000	0000
9	400B	1	2342	121	51	B2A2D3B2B1	00000	0000
10	400B	1	2342	121	51	B2A2D3B2B1	00000	0000
11	400B	5	2342	121	51	A1A2D3C2B1	00000	0000
12	400B	1	2342	121	51	A1A2D3C2B1	00000	0000
13	400B	1	2342	121	51	A1A2D3C2B1	00000	0000
14	400B	1	2342	121	51	A1A2D3C2B1	00000	0000
15	400B	1	2342	121	51	A1A2D3C2B1	00000	0000
16	400B	1	2342	121	51	A1A2D3C2B1	00000	0000
17	400B	1	2342	121	51	A1A2D3C2B1	00000	0000
18	400B	1	2342	121	51	A1A2D3C2B1	00000	0000

Key 1
Key 2
Key 3

Start Stop

Attach blank key : 400B into the main key cutting groove
press enter
Key #1, 3 of 3

Fig 3 - Job list

At this stage all 3 keys have the same text in the marking fields.

To replace MRK2 with key numbers: add * to mark zones 1 & 3, to ensure the current text doesn't change. Add ~ to the MK2 field. Enter the number 1 in the start field to indicate the first number to appear on the key. Confirm by clicking **Apply**.

Main screen

The marking of the keys in the job list will be presented as shown in Fig 4.

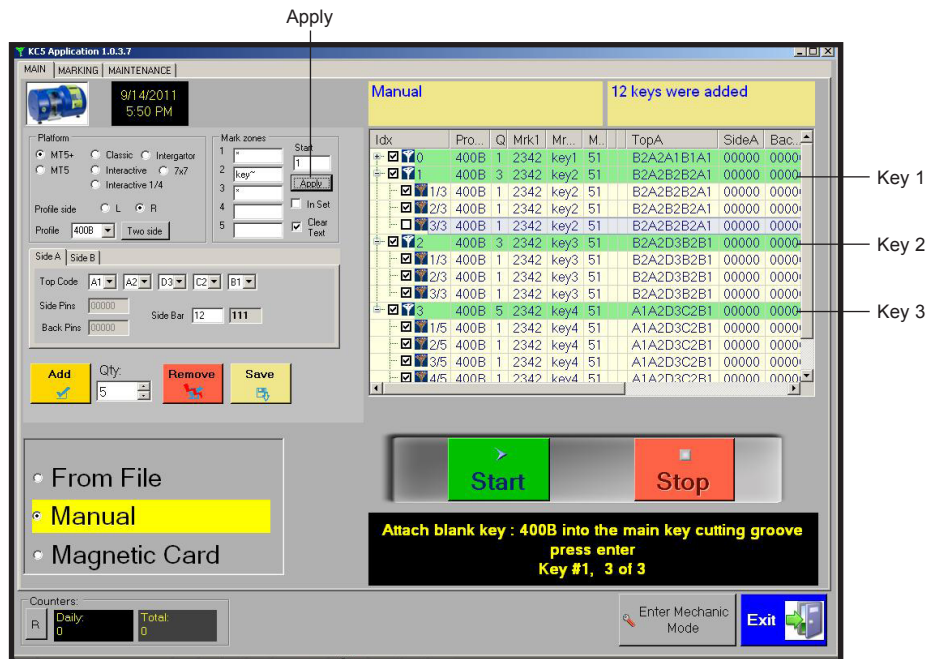


Fig 4 - Key numbers

All 3 copies of each key are marked with the same number.

In order to change MRK3 to the number of each copy enter * into the mark zones of fields 1 & 2, to ensure the current entry does not change.

Enter ~ in the MRK3 field. Select **In set** to order the SW to mark only the copies, and not the keys. Confirm by clicking **Apply**.

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The marking of the keys in the job list will be presented as shown in Fig 5.

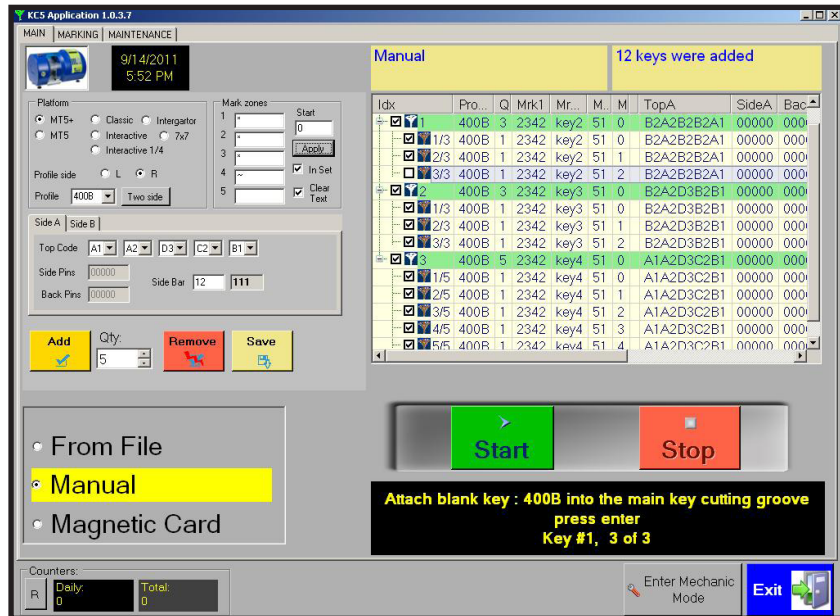


Fig 5 - Key marking

Note: this procedure can be applied to each of the marking zones.

5.3 Magnetic card

To cut a key from a magnetic card, select the **Magnetic card** option.

Swipe the magnetic card through the machine's card reader. Insert the key blank and follow the instructions displayed on the SW screen. Press **Enter** on the keyboard or on the machine's keypad.

6. Marking

6.1 Marking screen

On the marking screen, the locksmith controls the marking options. The locksmith may add his own text to be marked on the key or import an icon.

Note: the icon is a *.dxf file. The drawing files can be generated by AutoCAD®, Solidworks®, or any similar CAD program (AutoCAD and Solidworks are trademarks).

There are several marking tabs for each authorized platform. Each tab allows 5 different marking zones.

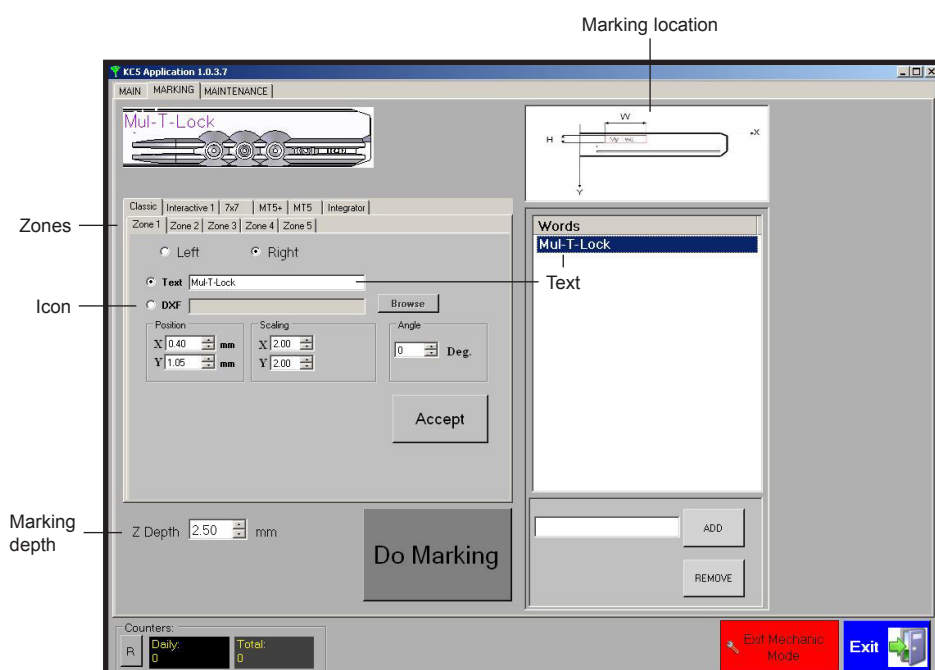


Fig 6 - Marking screen

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Marking

6.2 Marking parameters

Text: edit the text to be marked on the key. The user can also select a word from the words list.

DXF: browse for a dxf file.

Note: the software does not support spline DXF.

Browse: browse for an Icon file. This is a *.dxf drawing file that can be generated by Computer-Aided Design software such as AutoCAD®, Solidworks® or any similar CAD program (AutoCAD and Solidworks are trademarks). The drawing must be in one layer.

Close: close an open file.

Position:

X: location of the rectangle, 0 on top left of the key (on the X axis)

Y: location of the rectangle, 0 on top left of the key (on the Y axis)

Note: changing the position of the marking is also possible by clicking the text on the key image and dragging it to the desired position.

Scale: marking scale relative to window size

Rotation Angle: rotation angle in degrees of the string inside the window.

Accept: set rectangle data.

Z Depth: marking depth. Controls the depth of the marking with option of saving as default.

Note: when starting the SW for the first time, it is important to calibrate the marking depth. Start from minimum of 2.5 mm and reduce the value with 0.2 steps until the marker reaches the surface of the key blank.

Do Marking: mark the key with the currently displayed marking zone.

Text database: the user has the option of adding or removing text from the database. The user can enter a text to be marked from the words list, and then select **Add**.

By clicking on a text and selecting remove, the text will be deleted. Selecting a different text will change the entry at the text line of the current zone.

7. Maintenance screen

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Note: to enter the maintenance screen use the password '123'.

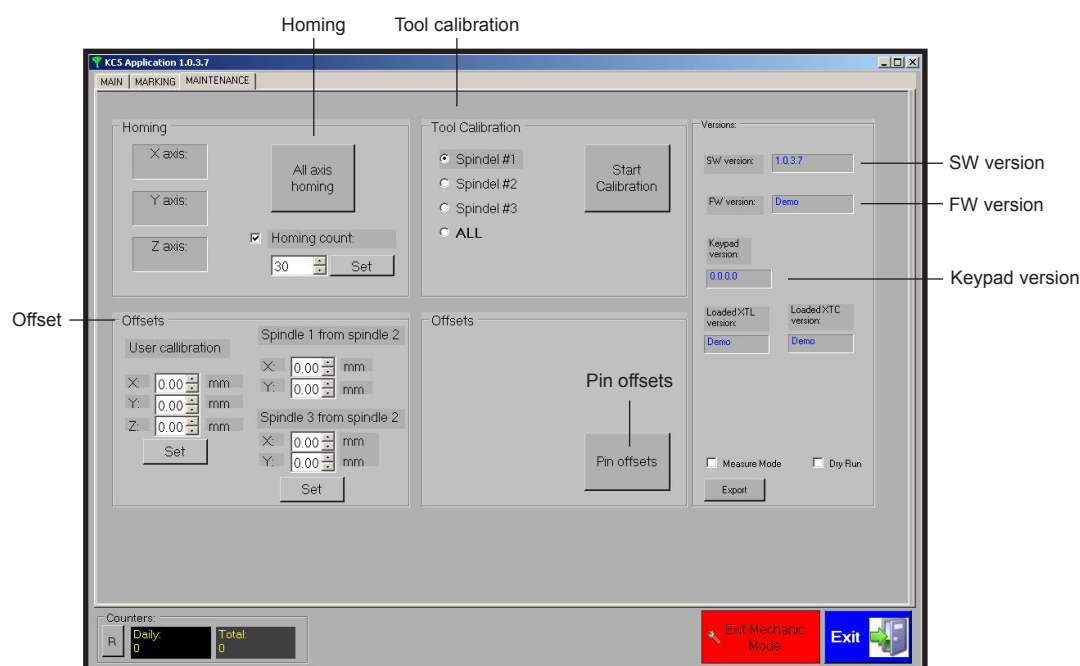


Fig 7 - Maintenance screen

7.1 General description

In the maintenance screen the user can perform service operations such as tool calibration or changing tools' offset measurements if needed.

The user may view the SW, FW and keypad versions currently installed.

Maintenance

7.2 Machine spindles

The spindles are numbered from top to bottom. Spindle #1 is the uppermost and spindle #3 is the lowest.

Spindle #1 - cuts external combination cuts.

Spindle #2 - cuts internal and 7x7 combination cuts.

Spindle #3 - cuts the milled pattern groove in MT5+.

Spindle 1 from spindle 2:

X Axis: correct the location of spindle #1 relative to spindle #2 in the X direction.

Y Axis: correct the location of spindle #1 relative to spindle #2 in the Y direction.

Spindle 3 from spindle 2:

X Axis: correct the location of spindle #3 relative to spindle #2 in the X direction.

Y Axis: correct the location of spindle #3 relative to spindle #2 in the Y direction.

SET: set the newly entered data.

Note: the offset above is the location of the milled pattern groove relative to the internal combination.

All Axis Homing: find the reference for each Axis (Home). This needs to be done every time the machine is started or after the Emergency button has been pressed.

Start Calibration: whenever a tool is replaced (cutter, engraver) tool calibration must be performed. Select this button to perform calibration of one or all (recommended) tools.

Maintenance

7.3 Machine axes - names and directions

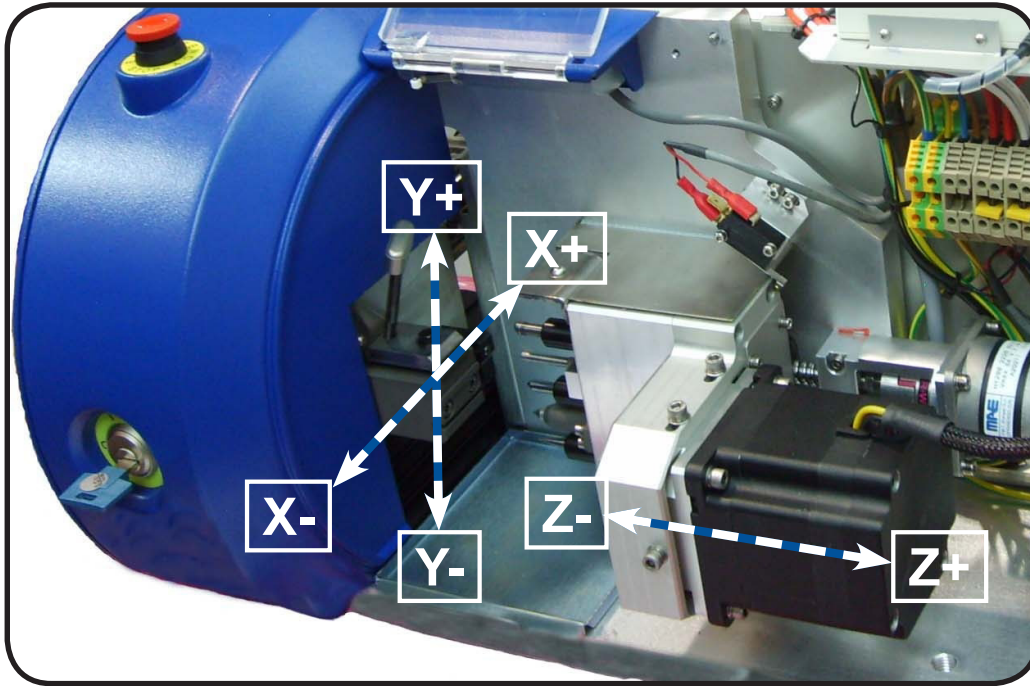


Fig 8 - Machine axes - names and directions

X axis: controls chamber position from key tip to chamber center.

Y axis: controls chamber position from key side surface to chamber center.

Z axis: controls depth of combination cuts.

Example:

If the depth of a combination cut is deeper than 0.12 mm according to drawing tolerance stipulations, you need to add 0.12 to the number in the Z window (Z axis +0.12). Cut another key and measure the depth once again, and repeat until the measured dimension is at the middle of the tolerance.

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Pin Offset: this option is used to define pin offsets on the z axis.

Do not change any of the parameters.

The relevant parameter in this screen is the **Pin Side Location 2**. Select this button if during the process of cutting side pins the machine goes lower than the key to perform the side pin cuts.

Note: 2 types of key clams are used in the KC5 machines. In one type the side pin groove is located under the main key groove, while in the other type the groove is located approx. 17 mm below the main key groove.

The screenshot shows the 'frmCompensation' software window. It contains several sections for configuring pin offsets:

- Classic, Interactive:** Includes input fields for A, A*, B, B*, C, C*, D, and a 'Side pin' field. Below these are numbered inputs 1 through 5. A 'RESET' button is present.
- MT5:** Includes input fields for A, B, C, D, and a 'Side bar' field. Below these are numbered inputs 1 through 5. A 'RESET' button is present.
- 7x7, Integrator:** Includes numbered inputs 1 through 6. A 'Side pin' field and a 'RESET' button are also present.
- Side Pins Offset:** This section is highlighted. It contains 'Side pin X' (set to 0) and 'Side pin Y' (set to 17.83). A button labeled 'Pin Side Location 2' is selected and highlighted in blue. A label 'Pin Side Location 2' points to this button.

At the bottom of the window are two large buttons: 'Set' and 'Close'.

Fig 9 - Pin offset screen

Maintenance

7.4 Loading utility

An extra utility, the loading utility, will be set up with the installation process, and a shortcut will be placed on the desktop. Double click on the icon to launch the utility.

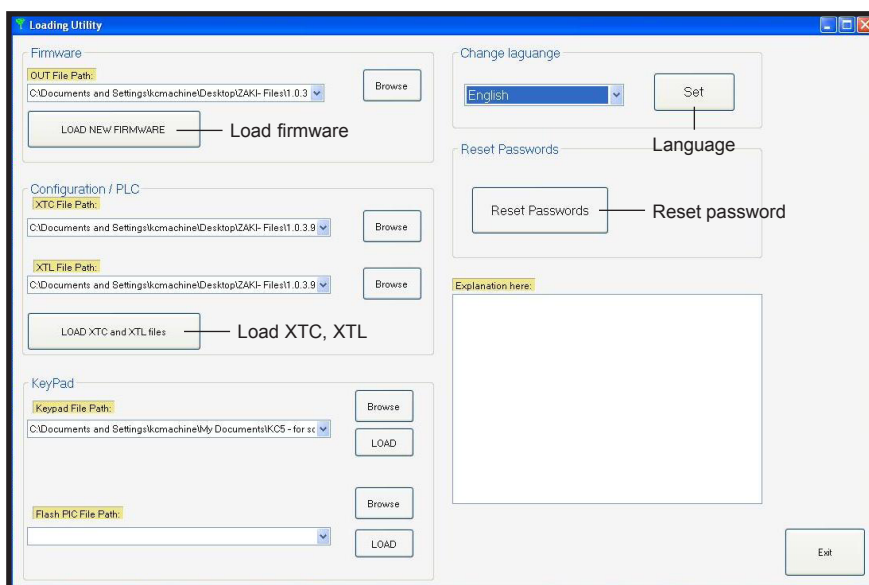
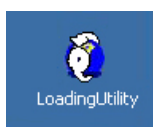


Fig 10 - Loading utility screen

Loading utility main functions:

1. Loading the KC5 controller with an updated firmware, XTL and XTC files.

Note: upload firmware updates, XTL or XTC files only if instructed to do so by Mul-T-Lock Technical Support.

2. **Selecting user language:** The default user interface language is English. The user may change it to the preferred user language. Supported languages: English, French, Dutch, Hebrew, Spanish and Italian.
3. **Reset password:** Click **Reset** to reset passwords to default options.
SW: kc5
Maintenance: 123

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Notes

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. At the very bottom, there is a solid gray rectangular area. There is no handwriting or other markings on the page.