

User Guide

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1. INTRODUCTION

This **Ma7 Driver** software has been written to interface between the **touch foil** running in Windows 98/2000 XP, Vista and NT operating systems.

The software comes in two executable files:

The Driver (**Ma7_Driver.exe**) controls the mouse pointer and activates the mouse left button in various modes when a user touches the touch display.

The Control Program (**Ma7_Control_En.exe**) is used to set up the driver.

The configuration of the touch foil is stored in a file called **Ma7.ini** and this is saved in the same directory as **Ma7_Driver.exe**. Once set up, only these files are required to run the driver.

2. COMPATIBILITY

This program is compatible with Windows 98/2000 XP, Vista and NT.

Note:

1. **Please note: The touch screen touch function is disabled on first start up, you must enable (see section 6) only after you have set up the calibration and touch sensitivity.**
2. **You must save the configuration before closing the MA7 after the following setup procedure.**

3. INSTALLATION

Auto Installation CD

Our driver software CD has an auto installation function built in. On the CD you will find 5 touch drivers. Primarily drivers 0, 2, and 3 will be the most commonly used. Drivers 4 and 5 are for special long narrow foils.

The files in the Drivers' folders **must not have their names or locations changed** otherwise the auto install process will not function correctly. You may add/modify/remove files in the Touch Documentation folder as these are not used for the auto install, but for your use in installing the foil and rebranding the software.

Any updates to the drivers, PDFs, or bitmap files must be made in each of the driver folders to achieve consistency and allow the auto install to function. Again be aware that names and file locations must remain the same as their original state.

Loading the Touch Driver Software onto PC

1. Switch on projector/LCD and align image with the active area of the touch foil.
2. Insert the ViP Interactive driver disc into the PC. Installation will start automatically
3. Follow instructions on the screen
4. During the installation process ensure that you create a new folder (named in accordance with the driver number) and remember the location of this folder
5. Further documentation can be found in the Touch Documentation folder on the touch CD

4. NT USERS ONLY

Upon starting, Windows NT interrogates the comms ports, information sent by the touch foil is wrongly interpreted as a mouse and the operating system sets the port accordingly. This prevents the comms port from being used by the touch foil. To stop this happening do the following:

Cold-boot the machine **WITHOUT** the touch foil connected.

Once booted-up connect the touch foil to a free serial port and run Ma7_Control_En.exe. Note which port the touch foil is connected to.

Using NT Windows Explorer find the file BOOT.INI and change the file attributes so that the file is **NOT** read-only.

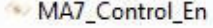
Add with one space the following /NoSerialMice:COMX (where X is comm port) to the following line:

```
multi(0)disk(0)rdisk(0)partition(3)\WINNT="Windows NT Workstation Version 4.00"
```

Therefore for an installation where COM1 is to be used by the touch foil the typical BOOT.INI would be:

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(3)\WINNT
[operating systems]
multi(0)disk(0)rdisk(0)partition(3)\WINNT="Windows NT Workstation
Version 4.00" /NoSerialMice:COM1
multi(0)disk(0)rdisk(0)partition(3)\WINNT="Windows NT Workstation
Version 4.00 [VGA mode]" /basevideo /sos
C:\="Microsoft Windows"
```

5. STARTING THE DRIVER CONTROL PROGRAM

1. To start the driver, go to the new directory and **double click Ma7_Control_En.exe** icon.

2. If it is required to start the driver every time Windows is started then a **short cut to Ma7_Driver.exe (not the program)** is installed in the **Start-Up folder**

When the program is started it displays the following window:

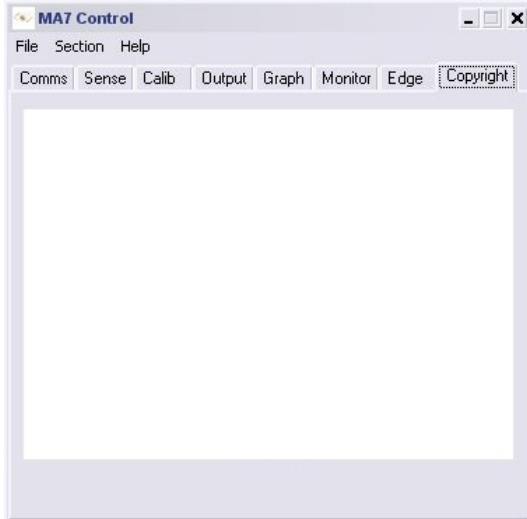


Fig 1

6. CONFIGURING THE COMMUNICATIONS PORT

Serial Communications

When the program has loaded:

1. Select the Comms tab
2. If you are using a Serial to USB convertor with Win 98 or XP, please install the driver software **before** you connect the USB cable. With Windows Vista you connect the cable first to collect the driver from the internet
3. Connect to a free serial port or USB port if you are using a Serial to USB adaptor. Other devices, drivers or programs **must not** address this port.
4. Make sure the driver box called '**Present**' is red and select the appropriate port that the touch foil is connected to. **Do not use the USB port selection**
5. Select 19.200 Baud rate
6. Tick the '**Open**' box in the **Status section**
7. When the driver recognises the touch foil, the **Open**, **Active** and **Valid** boxes will go red
8. The button called **Reset** will reset the touch foil driver when pressed

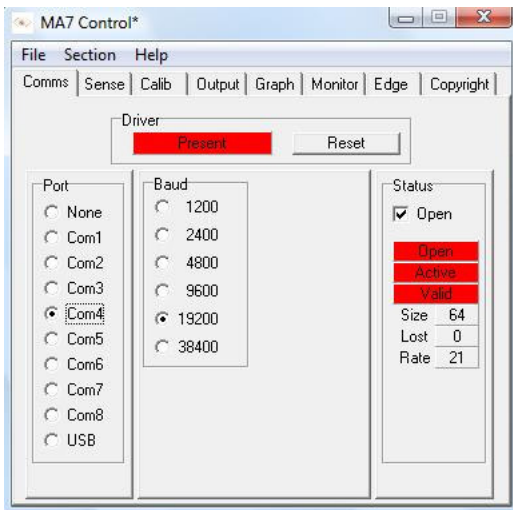


Fig 2

USB Communications

When the program has loaded: Select the **Comms** tab

1. Connect to a free USB port.
2. Select **USB** option in the **PORT** section.
3. Make sure the driver box called '**Present**' is red indicating that the driver has loaded.
4. Tick the '**Open**' box in the **Status section**
5. When the driver recognises the touch foil, the **Open**, **Active** and **Valid** boxes will go red
6. The button called **Reset** will reset the touch foil driver when pressed.
7. Select the **SampleTime** you require which changes the scans per second as shown in the box called '**Rate**'. The faster the scan rate the more responsive the touch but the capacitive field generated is less and therefore goes through less material. **Sample Time** against **Rate** is shown in the table below:

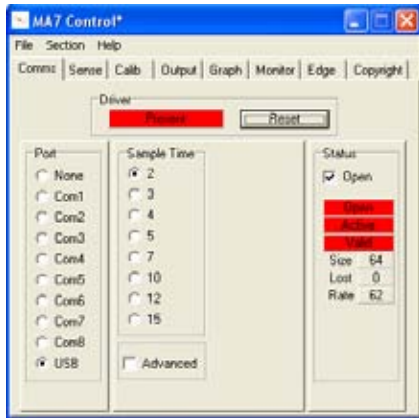


Fig 3

Sample Time	Rate (Scans per second)	Material thickness and response
2	61 - 62	Thin e.g. approx 4mm non-metallic material – sheet of glass for LCD Integration
3	49 - 50	
4	46 - 47	
5	40 - 41	Medium e.g. approx 10- 12mm non-metallic material – standard window for through window touch
7	33 - 34	
10	27 - 28	
12	24 - 25	
15	20 - 21	Thick e.g. approx 20mm non-metallic material – double glazing* – total construction of glass and air gap

* In this mode we recommend only touch not the touch and drag function. Due to the variation in double construction glass we recommend testing with a foil during the survey of each individual site since it is impossible to guarantee the foil will function in all cases.

Follow the above scan rates beginning with a lower sample time to determine the best response for your touch system. Different materials have different characteristics which will determine how the foil performs. Therefore we provide a flexible choice of sample times to ensure that your touch system is as responsive as possible.

Adjustment of the **Coarse Sensitivity**, **Press Threshold** and **Finger Pressure** in the '**Sense**' section of the driver may be needed after each Sample time adjustment. Experimentation is required for new users of this system to gain the knowledge required to make future installations very easy.

7. EXPLANATION OF THE STATUS SECTION

The following explanation of the **Status** section assumes that the touch foil is physically attached to a serial port of the PC:

Open - will go red and remain red only when the driver is present, the correct port is chosen and the Baud rate is set correctly.

If the **Open** box does not go red then the driver is not loaded or another driver has taken the port.

If the **Open** box goes on and off repeatedly then the driver is loaded but another piece of hardware is on that port or the Baud rate is set incorrectly.

Active - will go red and remain red only when the driver is present, the correct port is chosen and set to the correct Baud rate and when **Open** is red.

Active - will flash on and off to indicate there is activity on the port but it is some other hardware device.

Valid - will only go red and remain in this state when both **Open** and **Active** are red and the Baud rate is set correctly.

Only when **Open**, **Active** and **Valid** boxes have all changed to red and remain red is the touch foil ready for the next stage of driver setup.

When communications exist between the driver and the touch foil, the three boxes **Size**, **Lost**, **Rate**, will display data. These indicate the following information:

Size - number of wires in the touch foil sensor.

Lost - how many data scans have not been captured by the driver.

Rate - how many scans of the touch foil per 1 second.

Reasons why the driver does not see the touch foil are usually:

- Touch foil on a different port to the one selected
- The Baud rate is incorrect
- Another device, driver or program is using the port

Note:

The mouse pointer will not respond to a touch until it has been enabled in the Output section of the Control Program. Details of this will follow later in this manual.

The **Reset** button loads fresh data from the touch foil. This is used as a reference for detecting any new touches. This may be necessary if the touch foil environment has been changed; for example, the touch foil has been moved relative to the display or housing.

8. ADJUSTING THE TOUCH SENSITIVITY LEVEL

Automatic Setup

1. To select the sensitivity setup click on the **Sense** tab.

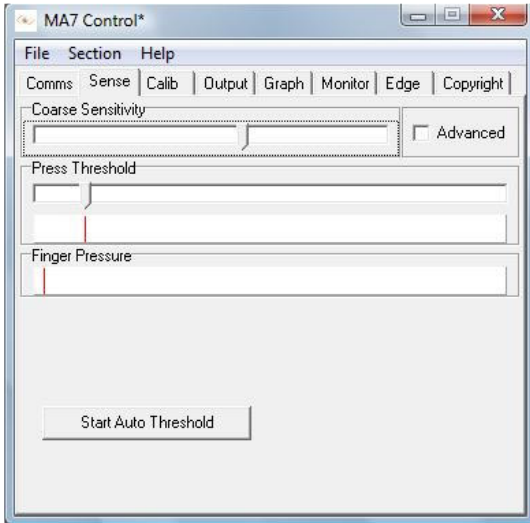


Fig 4

2. First set the course sensitivity to approximately two thirds by dragging the bar with your mouse.
3. Set the press threshold to approximately one third by dragging the bar with your mouse.
4. Click on **Start Auto Threshold**. The following image appears:



Fig 5

5. Place your finger over the centre red circle and follow it with your finger until it turns green Fig 4. Remove your finger. The automatic adjustment of sensitivity is now complete and the screen returns to Fig 4.

Manual Sensitivity Setup

6. The **Coarse Sensitivity** slider is used to set the sensitivity of the touch foil. If the slider is set to the right, the touch foil is more sensitive to detecting a touch. More or less sensitivity may be required, dependent upon glass thickness or if the system is to be used with gloved hands.
7. The moving indicator under **Finger Pressure** shows the strength of touch foil signal. Nominally the **Coarse Sensitivity** slider is adjusted so the **Finger Pressure** indicator moves about a third of the way along in response to a light touch.

8. The **Press Threshold** slider is used to adjust the sensitivity of the touch to simulate a mouse button press. The driver recognises a touch when the **Finger Pressure** indicator exceeds the position of the **Press Threshold** slider. As default this is the same sensitivity level as required for mouse movement.
9. To make certain that the touch is sensitive enough all over the display area, move a finger around the touch foil and make certain that the **Finger Pressure** indicator always exceeds the **Press Threshold** slider position.

9. CALIBRATION

1. Select the **Calib** tab as shown below, click the '**Start Calibration**' box.

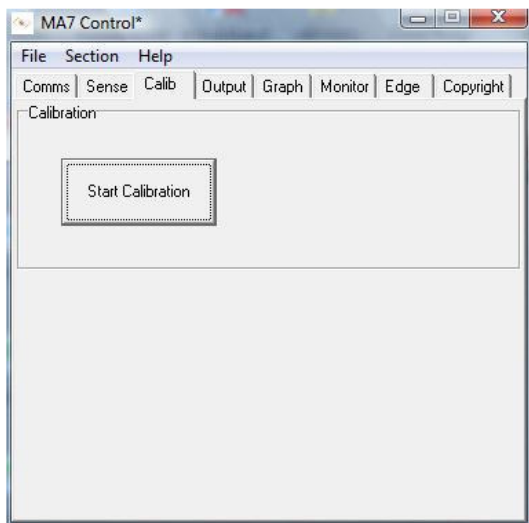


Fig 6

2. You will see the following on the screen; there are three targets to touch in total, like the one shown below:

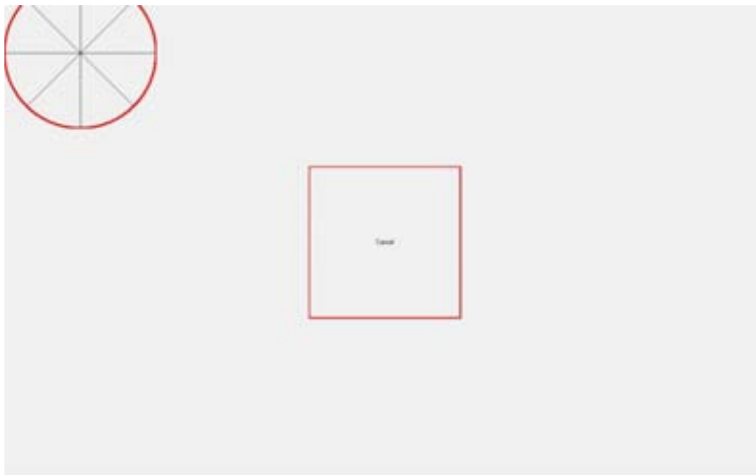


Fig 7

3. When each of these targets is displayed, **touch and hold** your finger on the centre of the target. **You must touch all three targets.**
4. The red circle in the target slowly moves towards the centre of the target.
5. Remove your finger only when the next target appears and touch that one.

If the touch calibration is not correct after this procedure, please run the process again and adjust your finger position on the targets to compensate for the misalignment.

10.MOVABLE TARGETS

Once the MA7 Control program has been opened, another program named **MA7 Configuration Settings** will be automatically saved to your folder. See Fig 8:

```

MA7 - Notepad
File Edit Format View Help
Copyright=Copyright (c)2002-2007, vis
Company=Visual Planet Ltd
Address1=Cambridge
Address2= Version E .General
Address3.VersionE.General=VersionE.Ge
Address4=England
Telephone=+44(0)8451235370
Patents_US=4954823,5844506,6137427.

[Calibrate]
TargetPos=0.100000001490116
Ref_TL_X=0.100000001490116
Ref_TL_Y=0.100000001490116
Ref_TL_A=0.0149999996647239
Ref_TL_B=0.920000016689301
Ref_TR_X=0.899999976158142
Ref_TR_Y=0.100000001490116
Ref_TR_A=1.30299997329712
Ref_TR_B=1.51400005817413
Ref_BL_X=0.100000001490116
Ref_BL_Y=0.899999976158142
Ref_BL_A=0.0769999995827675
Ref_BL_B=0.0489999987185001
    
```

Fig 8

Under the “Calibrate” heading in the MA7 Configuration Settings program there is a line starting with:

- TargetPos=0.x

Here, “x” is a value between 0.05 and 0.4. The value equates to a percentage of the screen size on the “X” and “Y” axis. See below:

- 0.05 = 5%
- 0.1 = 10%
- 0.2 = 20%
- 0.3 = 30%
- 0.4 = 40%

Therefore, changing the TargetPos figure will alter the position of the Calibration target on the screen. See Fig 8:

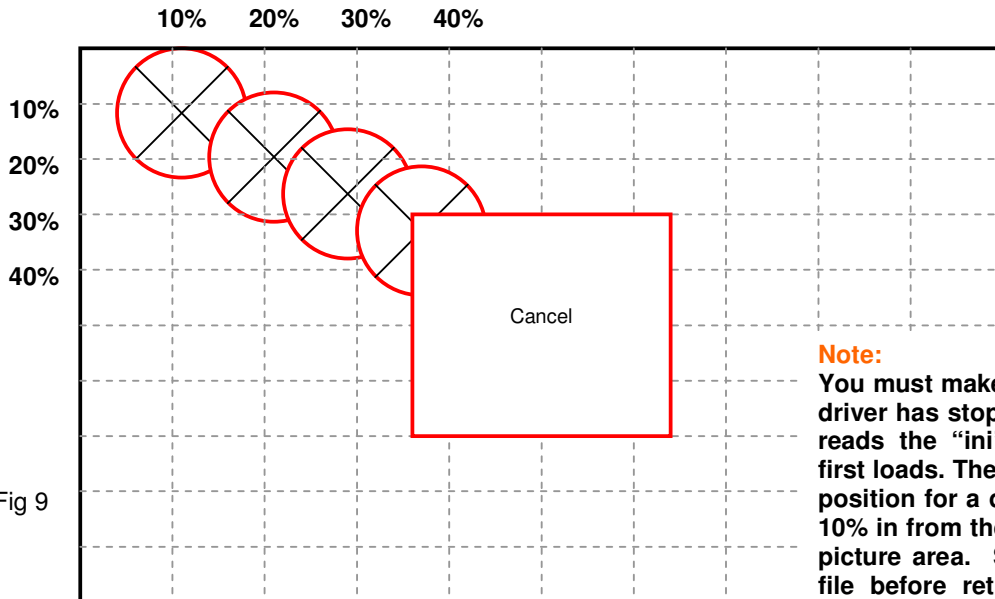


Fig 9

Note:

You must make sure that the driver has stopped as it only reads the “ini” file when it first loads. The normal target position for a driver is 0.1 or 10% in from the edges of the picture area. Save the “ini” file before returning to the MA7 Control program and re-starting the calibration process.

11. SETTING THE TOUCH OUTPUT TO SUIT THE APPLICATION PROGRAM

1. Select the **Output** tab.



Fig 10

2. **To enable the touch function on the screen check the enable check box.**
3. Select the required mouse control required for your application.
4. No action selects no mouse pointer movement or button pressing when touching the touch foil.
5. Move mouse only enables mouse pointer movement but no button movement when touching the touch foil.
6. Click on press enables mouse pointer movement and left button click when touching the touch foil.
7. Click on release enables mouse pointer movement when touching the touch foil and left button click when the finger moves away from the touch foil. This can be used in applications where the user needs confirmation the correct target has been selected before being activated with a button click by removing the finger.
8. Select/Move/Release (Previously Drag and Drop) enables the mouse pointer movement and left button down when the touch foil is touched. The left button stays down as the finger is moved around the screen and left button up does not occur until the finger is removed from the screen. The item selected is dragged around the screen following the mouse cursor movement and it is released only when the finger is removed from the screen.
9. Select/Hold/Release enables the mouse pointer movement and left button down when the screen is touched. The left button stays down as the finger is moved around the touch foil and left button up does not occur until the finger is removed from the touch foil. The item selected remains selected but remains in its original position, it stays selected until the finger is removed from the touch foil.

This mode is useful for Web pages where scroll bars can be manipulated by touching the end buttons but text cannot be highlighted. If the user selects a target and then moves away from target when removing the finger, the target selection is still valid.
10. Select/Move/Release/RC enables right-click menus to be activated by holding the touch on the foil for several seconds

12. YOU MUST NOW SAVE THE CONFIGURATION

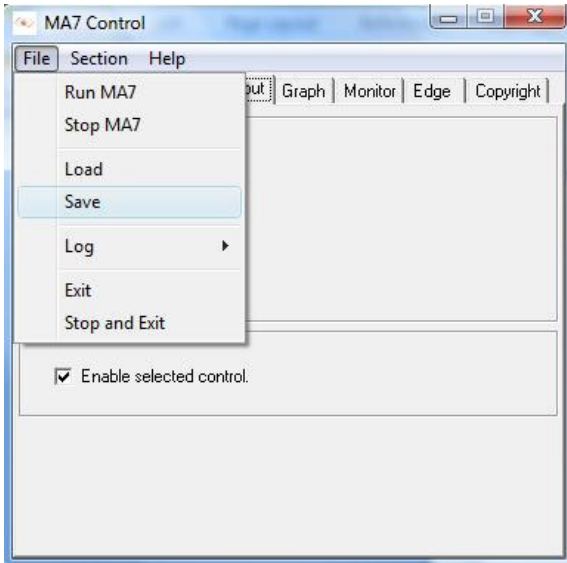


Fig 11

1. Click on file.
2. Click on save to save the current settings.
3. **When the touch foil driver has been set up and there is no requirement to change it.**

13. DIAGNOSTICS AND FREQUENTLY ASKED QUESTIONS

Testing the Hardware with 'Graph'

1. Select the **Graph** tab. (Depending on the Driver you are using, please see Driver number on Electronic Control Board and CD Label, your graph tab will look different)

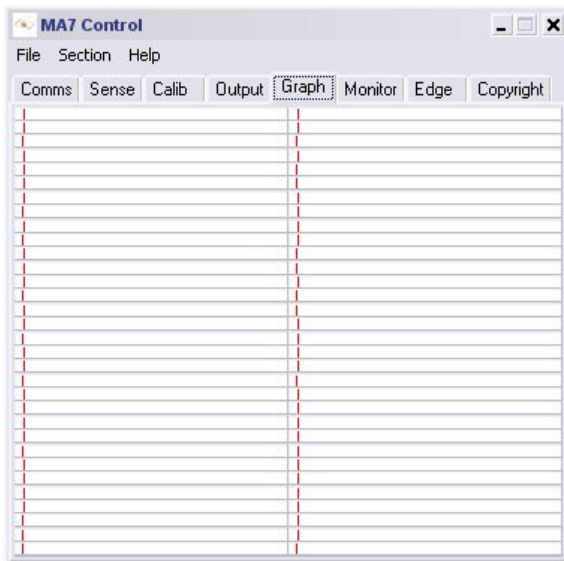


Fig 12 – Driver 0

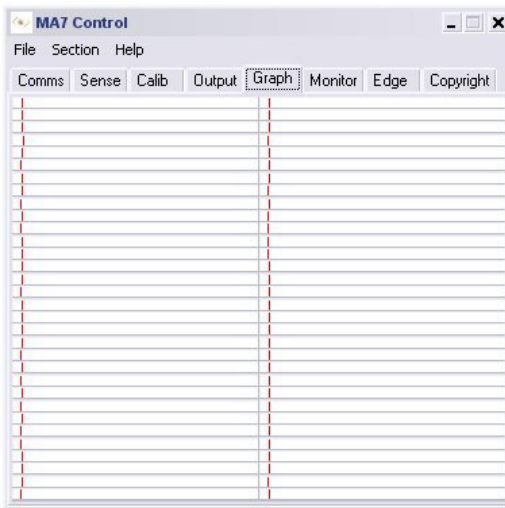


Fig 13 – Driver 1 (Rarely Featured)

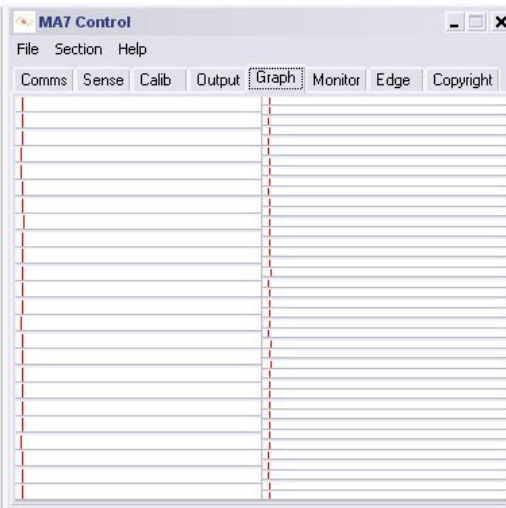


Fig 14 – Driver 2

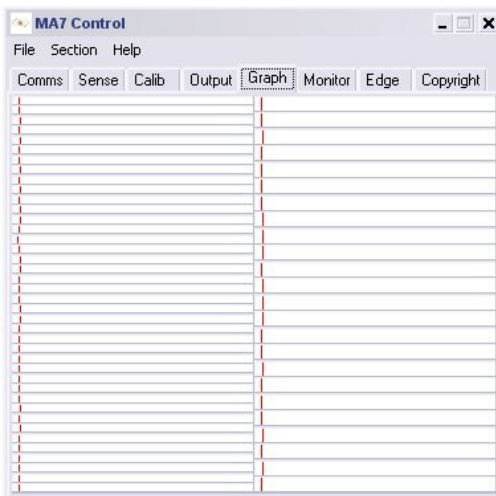


Fig 15 – Driver 3

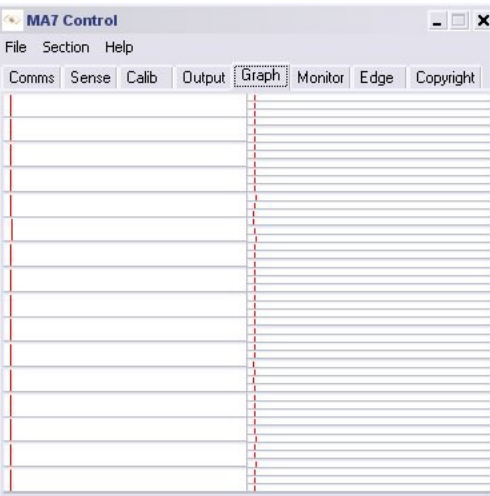


Fig 16 – Driver 4

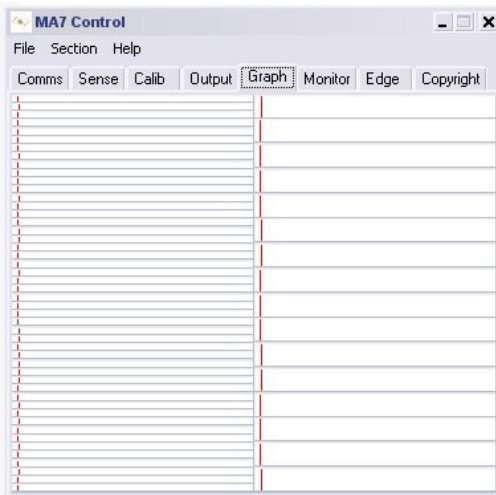


Fig 17 – Driver 5

2. Run a finger around the sensor, the effect of the finger on nearby wires can be seen by a visible movement on the indicators, each representing one wire. The algorithm in the driver interpolates the response curve to generate an accurate co-ordinate for the finger position.

The following hardware checks can now be made:

Wire Integrity Test

3. Run a finger in both horizontal and vertical directions slowly and check that each wire indicator moves in a similar manner to the others. This test will identify touch foil hardware and communication problems, which must be resolved before continuing with the driver setup.

Signal to Noise Check

4. There will always be some noise pickup on the touch foil; this can be seen by slight movement of the 64 indicators. The system can cope with this providing the noise is not excessive. Compare the signal strength of a finger against the noise. The touch foil should function acceptably providing the peak noise is no more than one-third worst-case signal strength.
5. If the system is very noisy then the source of the noise must be investigated. The most likely source is high voltage switching near the touch foil either from the display or nearby electronics. Try solving problems by earthing metalwork or moving the display further away.

Inter-Wire Linearity

6. Checking the shape of the waveform in response to a touch may assist in setting up the **Inter-Wire Linearity** described in the **Monitor** section.

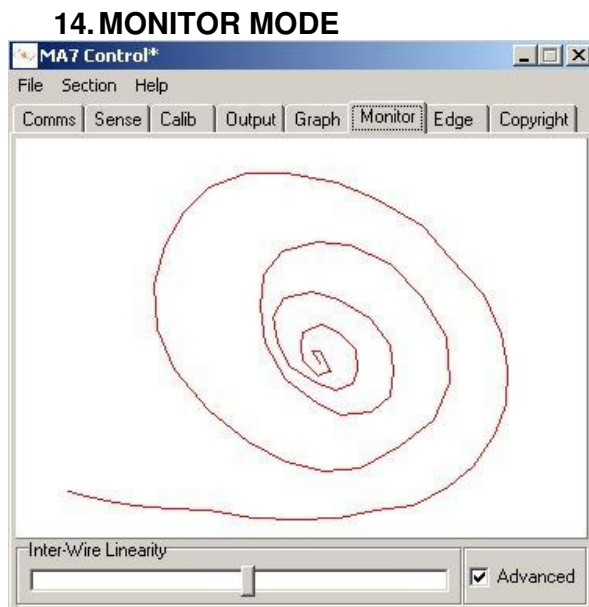


Fig 18

1. This section is used to check the output of the touch foil over the whole display area represented by the white box in the centre. It is useful in checking for any dead areas on the touch foil and the performance of the touch foil being able to follow the finger accurately and responsibly.
2. When using this feature make sure that the touch foil output is disabled by un-ticking the **Enable Selection Control** in the output section. When the finger is removed for a few seconds the display will automatically clear for more testing.
3. When the **Advanced** box is ticked the **Inter-Wire Linearity** can be adjusted if necessary. This allows the driver to handle different response curves caused by different sizes of touch foil and different glass thickness.

- The linearity can be adjusted for correct positioning between the wires. The default setting is centre, which should be satisfactory for most applications.
- If the touch sensor is large and there is a large gap between the wires or the signal is very strong the slider may need to be moved to the right. This is because the peak is very strong and involves very few wires and the algorithm to select touch position needs to change.

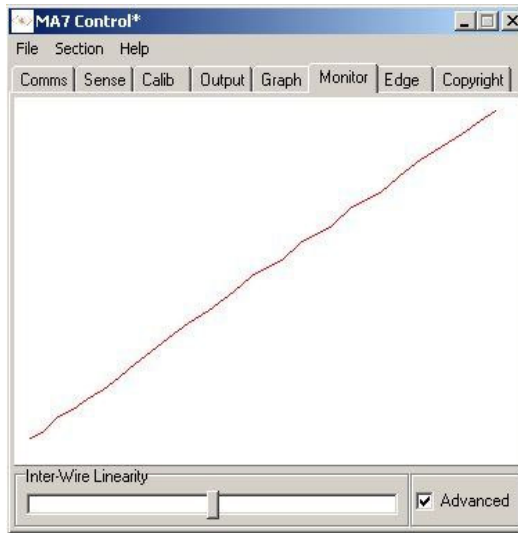


Fig 19
Inter-Wire Linearity set correctly

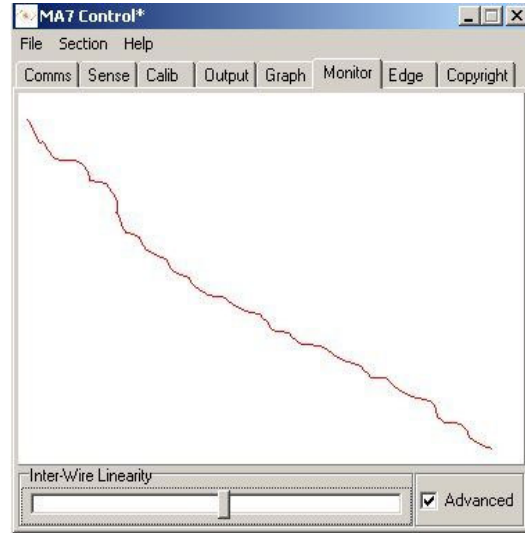


Fig 20
Inter-Wire Linearity set incorrectly

15. USING EDGE ENHANCEMENT

- To allow easy access to the sliders and buttons at the edge of the display, the cursor can be positioned nearer the edge of the screen. The amount of enhancement can be adjusted via the screen shown.

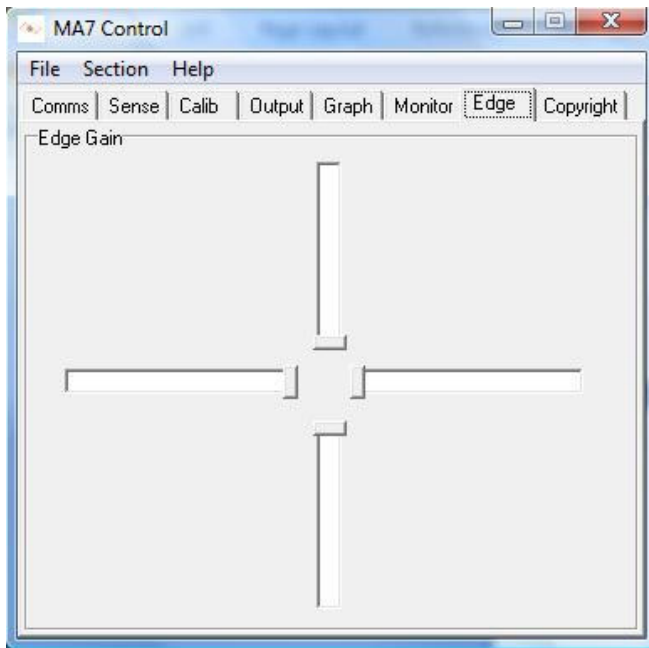


Fig 21

- Each of the sliders represents one edge of the sensor, the default position is as illustrated above.
- Edge Gain** can also be used to counteract the effects of nearby metalwork that surrounds the display area.
- The further the sliders are away from the centre, the greater enhancement is given to the appropriate edge. Too much edge enhancement will force the cursor to the edge of the display where it may not have the desired effect.

16. DELAYED STARTING OF THE DRIVER OUTPUT

1. When starting a touch foil computer system, it is sometime desirable to be able to prevent users from interfering with the start-up procedures from the touch foil. Delaying the action from the touch foil driver to the application can do this.
2. This has to be done by editing the **MA7.ini** file. This is found in the same directory as the **MA7_Control_En** and **MA7_Driver_En** programs. There is a line, **StartDelayInt1=0**. By changing the 0 to a number between 1 and 120 adds a delay of up to 120 seconds between the time when the driver is loaded and when it can be used to control an application program.

17. FAULT FINDING GUIDE

Driver Does Not See The Touch Foil

Touch foil on a different comm port than the one selected.
The Baud rate is incorrect.
Another device, driver or program is using the port.

Touch Foil Performs Badly Near The Edges Of The Display

Metal framework near to the touch foil may interfere with the touch foil performance. This effect can be diminished by increasing the distance between metalwork and the touch sensor or by coating the metalwork with an insulating paint or plastic coating. The driver can compensate by utilising the Edge Enhancement feature described in [Section 15](#) of this document. The effects of the framework can be stabilised if it is grounded.

False Touches

If the noise on the system is great, then the **Finger Pressure** indicator may move by small amounts without the presence of a finger. If the **Press Threshold** is set too low, then the noise on the system could trigger false touches. This can be remedied by adjusting **Coarse Sensitivity** to a lower level, thus making the system less sensitive.

Failure To See Touch Effect

The default settings for the touch foil driver is set so that the mouse cursor movement is disabled during setup. The user must enable this output option by following [Section 11, "Setting the Touch Output to suit the application program"](#).

If the selected option is enabled and touches are still not being registered, then adjustment to the **Press Threshold** is required to ensure the setting is to the left of the **Finger Pressure** indicator, all over the display area, when a finger is present.

Mouse Movement Is Not Smooth

Refer to [Section 14, "Monitor Mode"](#) and the effects of **Inter-Wire Linearity**. Adjustment to the **Press Threshold** may be required to ensure the setting is to the left of the **Finger Pressure** indicator, all over the display area, when a finger is present.

Changes To The Driver Are Not Being Saved

Make sure that after making changes to the setup program that the **Save** command is used, in the **File** pull down menu. Make sure no other versions of Ma6.ini or Ma7.ini files exist on the system, this problem normally occurs when an old Ma7 files exists in a Windows main directory.

Mouse Cursor Moves Randomly Or Seems Stuck

For the touch foil to work properly and effectively, it must be provided with a steady environment, therefore if the monitor or touch foil are moved this will upset the system. The driver should reset itself. However, a reset can be forced as described in [Section 6, "Configuring the Communications Port"](#). Alternatively, by pressing **CTRL+ALT+DELETE**, the driver can be stopped from running and restarted by selecting **File** and **Run Ma7** to restart.

Problems With Windows Automatically Running The Driver From Start-Up

If it is required to start the driver every time windows is started then a **short-cut** to **Ma7_Driver.exe** can be put in the **Start-Up folder**. The program itself must **NOT** be put into the **Start-Up** menu. If this is done then the driver will place a copy of the Ma7.ini into the start-up menu and Notepad will open and display the Ma7.ini file information. To correct this problem the machine must be returned to pre-MA7 driver installation condition. **ALL** MA7 related files must be removed from the machine including the Start-up Menu and the driver re-installed.

Slow Touch Screen Response When Using Windows 2000, Windows NT And XP In Power Hungry Applications

There are several ways to improve system performance.

Note:

The instructions below refer to Windows 2000, NT, XP has either the same or similar controls.

Optimise the Background performance against the Applications, to do this follow the simple instructions below:

Select the Windows START Button, go into Settings and Control Panel.
Open the System folder and select the **Advance** tab.
Press the Performance Options button.
Change the selection from Optimise Performance for Applications to Optimise Performance for Background Services.

Check or Change the Virtual Memory Settings

In the System folder under Advanced change the size of the page file. The rule of thumb is that the page size should be 1½ times bigger than the installed Ram. Therefore if the system has 256MB of ram the page size should be 384MB. If Page size is less than the above rule change it. If this rule has been followed then increase the size by say 3 times. Check the system performance each time the size has been increased.

Driver Priority Change

All Programs and Applications are given a priority. Increasing the priority given to it by Windows can boost the performance of an application. The user can do this as follows: Run Task Manager by pressing CTRL, ALT and DELETE in that order and all at the same time.

Select Task Manager followed by Processes.
Scroll down the list of running processes until the MA7 driver is found and right-click it.
Highlight the Set Priority and the following list should appear:

LOW, BELOW NORMAL, NORMAL, ABOVE NORMAL, HIGH and REALTIME

The driver should be running in NORMAL, change this to ABOVE NORMAL.
Test the response of the touch screen, the highest recommended setting is HIGH.
Do not select REALTIME as this would set the driver priority to be the same as the operating system itself; this can make the Windows operating system unstable.

Note:

A priority change is only valid on the Windows session that it was performed in. Hence when Windows is restarted or the machine is powered off then the changes are lost, the driver will be set back to a NORMAL priority level.

To set the priority settings permanently when the system restarts:

Create a touch foil_start.bat file in C:\All users\Start Menu\programs\startup

```
@echo off  
start /abovenormal c:\touch foil\MA7_Driver.exe
```

where c:\touch foil is the directory where the MA7_Driver.exe exists on your system.