Agilent Technologies

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1	New release for SJ GUI v4.06.02	February 2002 02EC-023

Please update U500mmi software to version 5.14, contact your local customer support representative.

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Agilent Technologies

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1 Backing Up and Restoring CPI and Registry Editor

You can now backup the contents of the CPI directory and Registry. These backups can then be used to replace cpi and/or Registry settings if they become corrupt. This is done using the **AgilentBackup** service, which is a standalone program that runs independently of the SJ.

1.1 Set Up the Registry Editor

The Registry Editor is used to specify where you want to save the backups of the cpi directory and Registry. The details contained in the Registry are read by the **AgilentBackup** service every time it is run, which is once every hour.

If the Backup service is unable to read the Registry settings, the error is logged in the log file ***LastBackupStatus.log*** in ***C:\temp***.

The Registry is set up using the following steps:

1. Click **Start -> Run** as shown in Figure 1-1:

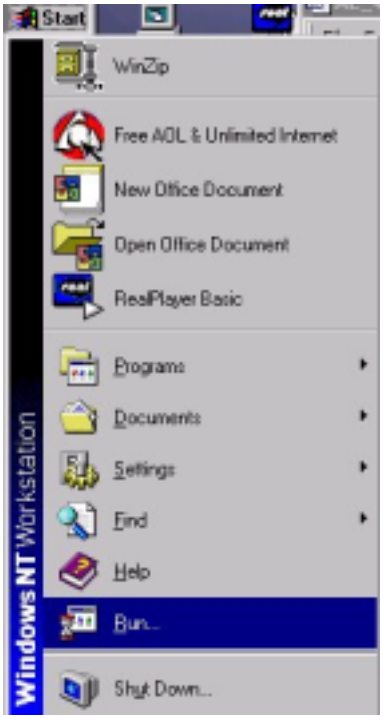


Figure 1-1 Start -> Run

2. Open the **Registry Editor** by typing '**regedit'** in the **Open** dialog box and click **OK**. This is shown in Figure 1-2:

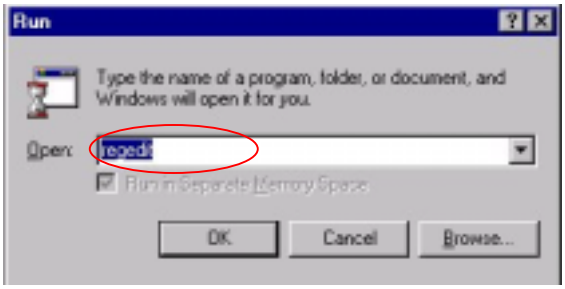


Figure 1-2 Type 'regedit' in Open Dialogue

3. Go to **\HKEY_LOCAL_MACHINE\SOFTWARE\MV TECHNOLOGY\GS-1\ServiceBackup**.

   There are two settings associated with the backup service. They are:
   - BackupDirectory
   - NextBackupDate

   BackupDirectory
   This setting is used to specify the location of the backups (in the form of a zip file) of the cpi directory and Registry. The default location is ***C:\FileMaintenance***.

   The backups of the cpi directory and Registry can be saved to any part locally on the PC or to a CD.

   The cpi backup file is called ***CPIbackup.tar.gz*** and the Registry backup file is called ***RegistryBackup.reg***.

   NextBackupDate
   This setting is used to specify the date the backups are made. The default is '**0000/00/00'**.

   When the first backup is complete, the setting automatically changes to the first day of the next month.

   For example, if you run the **AgilentBackup** service on the 15th of July 2001, when the backup operation is complete, the setting automatically changes to '**2001/08/01**'.

   This setting is also modifiable, so if you wanted to make backups for the end of every month instead of the start, you could set it to '**2001/08/31'** and then every month after this, manually set it to the last day of the month.

   Every time a backup file is created, the existing backup file is overwritten.

4. Double-click the **BackupDirectory** icon as shown in Figure 1-3:

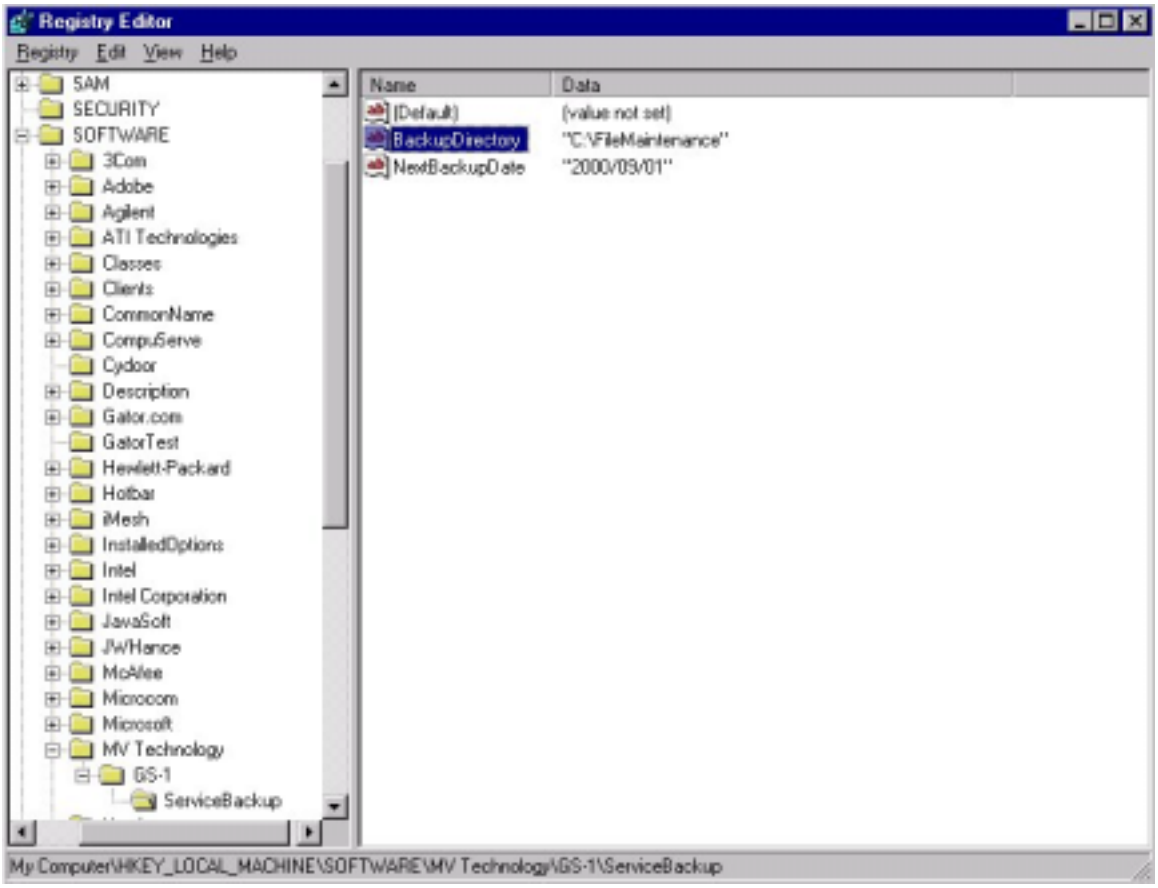


Figure 1-3 BackupDirectory Icon

5. In the **Value Data** text box specify the location of where you want the backup of the cpi directory and Registry to be stored. This is illustrated in Figure 1-4:

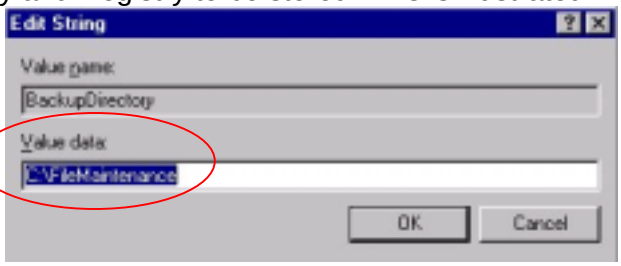


Figure 1-4 Location of Backups

6. Click **OK** to save the new value for the **BackupDirectory** setting, or **Cancel** to discard the changes made.

7. After you have made the first backup (i.e. **NextBackupDate** setting is no longer set to `'**0000/00/00'**) then you can change this setting by double-clicking the **NextBackupDate** icon and entering a new date in the format **YYYY/MM/DD**.

1.2 Start the Agilent Backup Service

1. Install the **AgilentBackup** service using the **AgilentBackup** InstallShield.

2. To check that you have correctly installed the **AgilentBackup** service open **Start -> Settings -> Control Panel -> Services**. If you have installed the **AgilentBackup** service, you can see it in the **Services** window as shown in Figure 1-5:

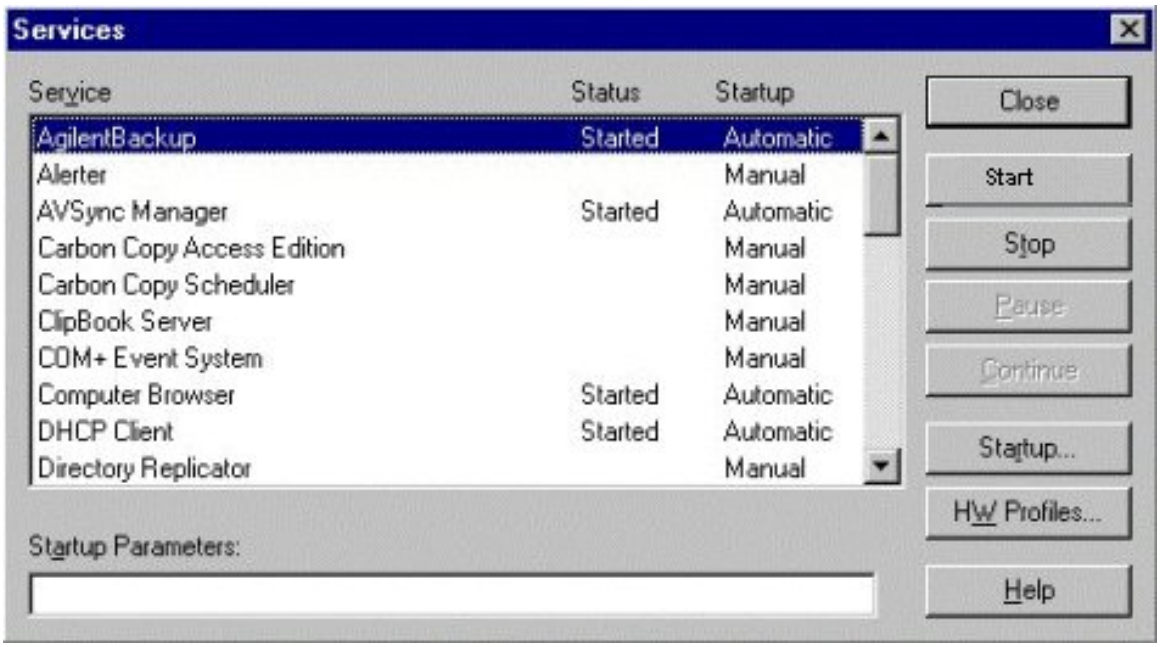


Figure 1-5 Services Window

3. The **AgilentBackup** service automatically starts running every time the system is rebooted. However you do not need to reboot every time you want to run the **AgilentBackup** service, you just need to click the **Start** button as shown in Figure 1-5.

   It is recommended that the system be rebooted after installing the **AgilentBackup** service.

4. While the backup service is running, the cpi backup file is called ***CPIbackup.tar*** and is found in the location specified in the Registry under the **BackupDirectory** setting (the default location is ***C:\FileMaintenance***).

5. When the backup operation is complete, the cpi backup directory is then called ***CPIbackup.tar.gz***.

6. When the backup of the Registry is complete, the Registry backup directory is called ***RegistryBackup.reg*** and is stored in the location specified in the **Registry**.

1.3 Backup Log Files

When the cpi directory and Registry are successfully backed up, the result is written to a back up file called ***CPIbackup.log***. This log file is stored in the same backup directory specified in the **BackupDirectory** setting. An example of this log file is illustrated in Figure 1-6:

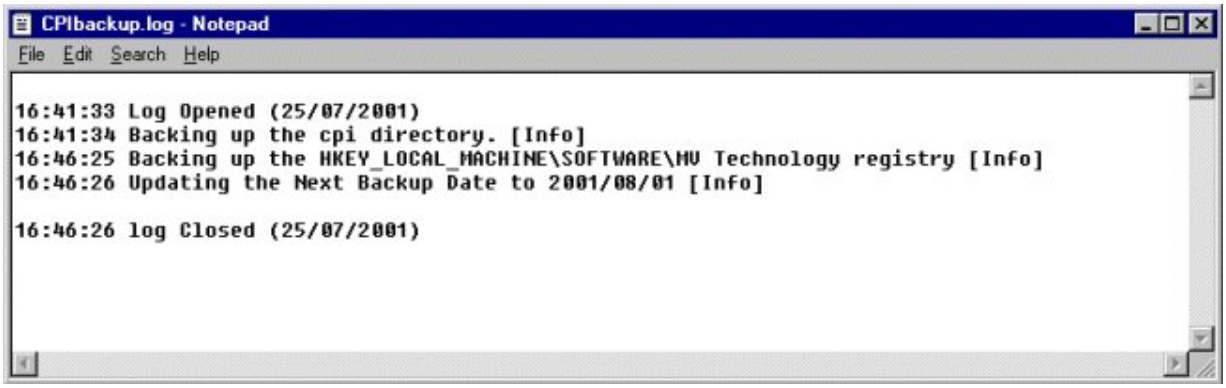


Figure 1-6 CPIbackup.log File

If the Registry or cpi directory is not successfully backed up, an error is written to the backups log file called ***LastBackupStatus.log***. This file is located in the directory specified in the **BackupDirectory** setting (i.e. in the same location as the cpi and Registry backups). An example of the ***LastBackupStatus.log*** file is illustrated in Figure 1-7:

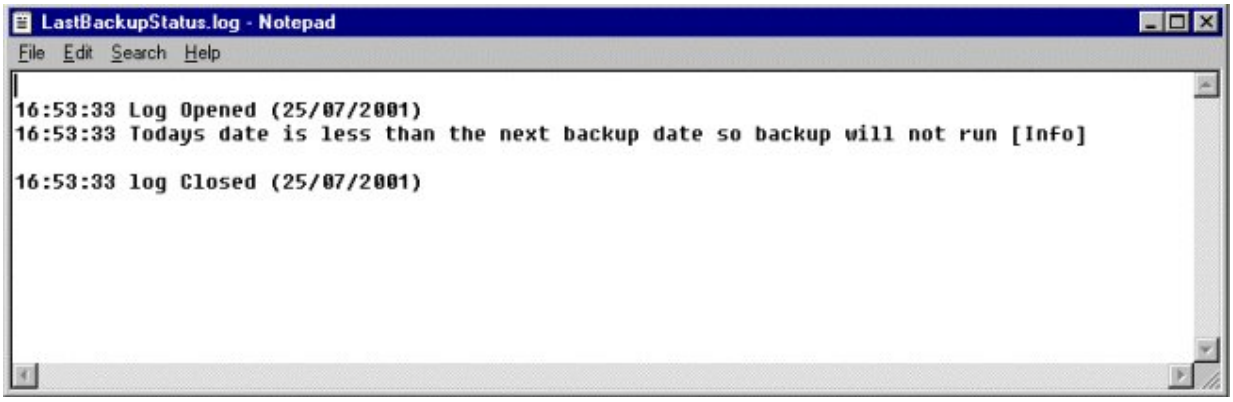


Figure 1-7 LastBackupStatus.log File

There is no transition Registry backup name, as the backup does not take long to complete.

1.4 Restore the CPI Directory

To restore the backup cpi directory to either the cpi directory or to an alternative location, carry out the following steps:

1. Click **Start -> Agilent Restore Backup**. A login window is displayed as shown in Figure 1-8. The **User Name** is '***agilent'*** and the **Password** is '***restore'***.

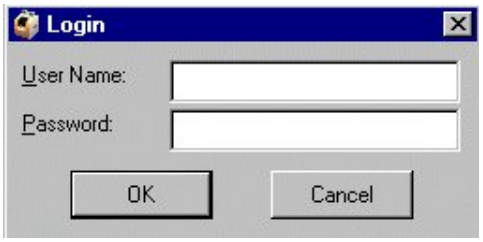


Figure 1-8 Login to Restore Menu

2. If you click **OK**, the **Restore** menu is displayed as shown in Figure 1-9. If you click **Cancel**, the following confirmation message is displayed:

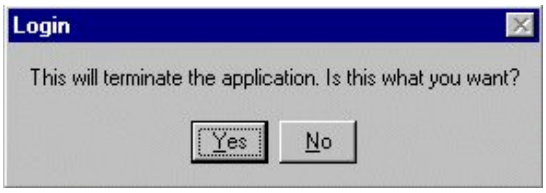


Figure 1-9 Abort Restore Operation Confirmation Message

3. There are two '**Restore'** options. Select the '**Restore CPI Directory'** menu option as shown in Figure 1-10:

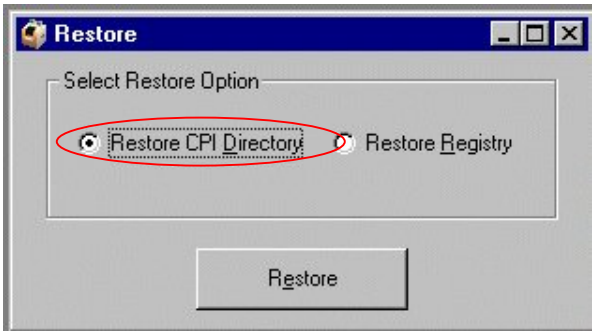


Figure 1-10 Restore Menu

4. Click the **Restore** button (as shown in Figure 1-10). The following menu is displayed:

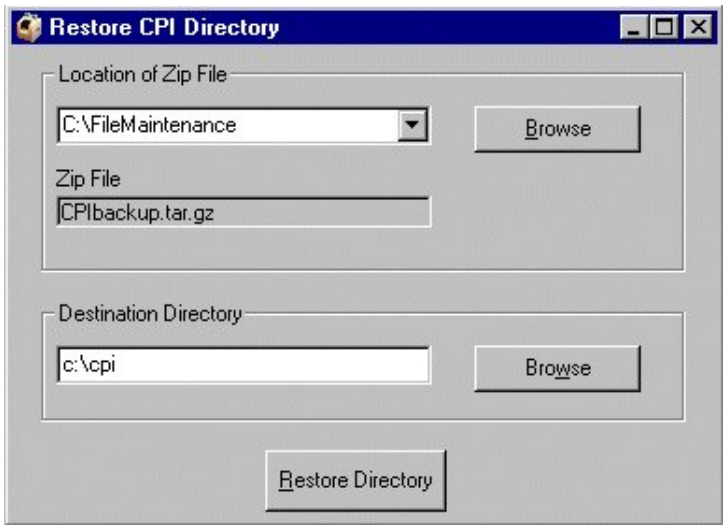


Figure 1-11 Restore CPI Directory Menu

5. Select the location of the cpi backup zip file by clicking the **Browse** button beside the '**Location of Zip File'** box.

6. If the ***CPIBackup.tar.gz*** file is not at the location defined in the previous step, the following error message is displayed in Figure 1-12:

Figure 1-12 CPI Backup Directory Error Message

7. Select the destination of where you want the cpi backup to be restored to by clicking the **Browse** button. This defaults to ***C:\cpi***. The cpi backup directory can be restored to any location locally.

   The destination directory does not have to exist before opening the '**Restore'** menu; it will be automatically created as part of the '**Restore'** operation.

8. Click the **Restore Directory** button.

9. If the '**Destination Directory**' setting you selected has only read access, it cannot be overwritten and the following message is displayed (figure 1-13), halting the restoration operation:

Figure 1-13 Destination Directory Does not Have Write Access

10. When the '**Restore'** operation is ready to continue and before the cpi backup directory is unzipped, a message is displayed informing you that the existing backup directory is not automatically backed up, and to keep it you need to manually back it up before proceeding. The following message is displayed:

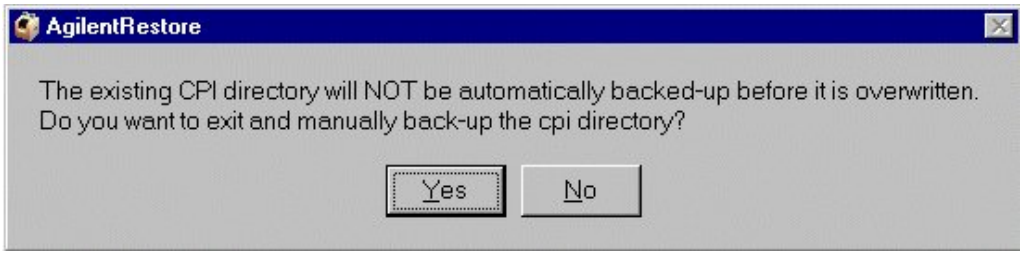


Figure 1-14 AgilentRestore Message

11. If you click **Yes** the '**Restore'** operation is postponed. If you click **No**, the message is disregarded and the '**Restore'** operation continues.

12. If you stored the ***CPIBackup.tar.gz*** file on the network, then it is copied over to ***C:\Temp***, as it will make the restoration process a lot quicker than copying it over from the network. The following message is displayed:

Figure 1-15 Copying CPI Backup file to C Drive

13. When you click **OK,** the following the '**Copying'** status message is displayed:

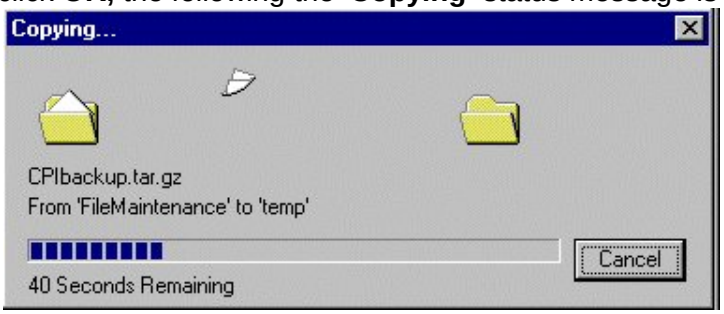


Figure 1-16 Copying 'CPIbackup.tar.gz' Status Message

14. Click the **Restore Directory** button to begin the restoration process. The following message is displayed as the cpi backup zip file is being unzipped:

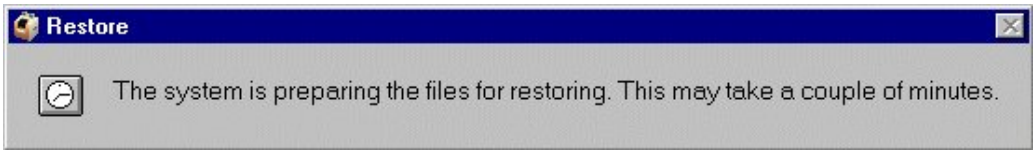


Figure 1-17 Unzipping CPI Backup Directory Message

15. If the destination directory does not have adequate space, the following message is displayed and you will have to either select a new destination or make space in the existing destination directory:

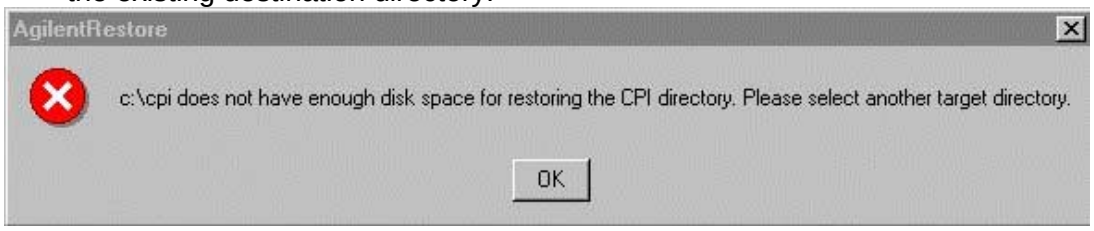


Figure 1-18 Target Directory Does Not Have Enough Space Message

16. When the file has been unzipped, the following command prompt window is displayed showing each of the files being restored (they are being restored as they are listed in the window):

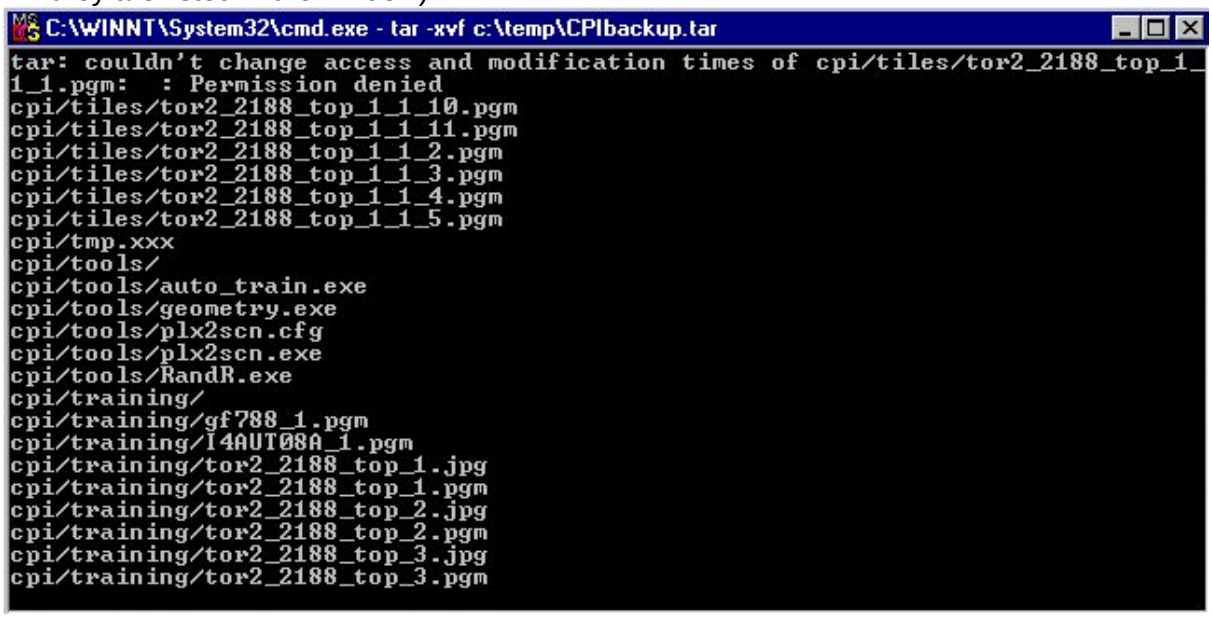


Figure 1-19 Command Prompt Listing Files Being Restored

17. When the files stop listing in the window and the command prompt **`C:\keepfiles>`** is displayed, the restoration process has finished. This is displayed in Figure 1-20:

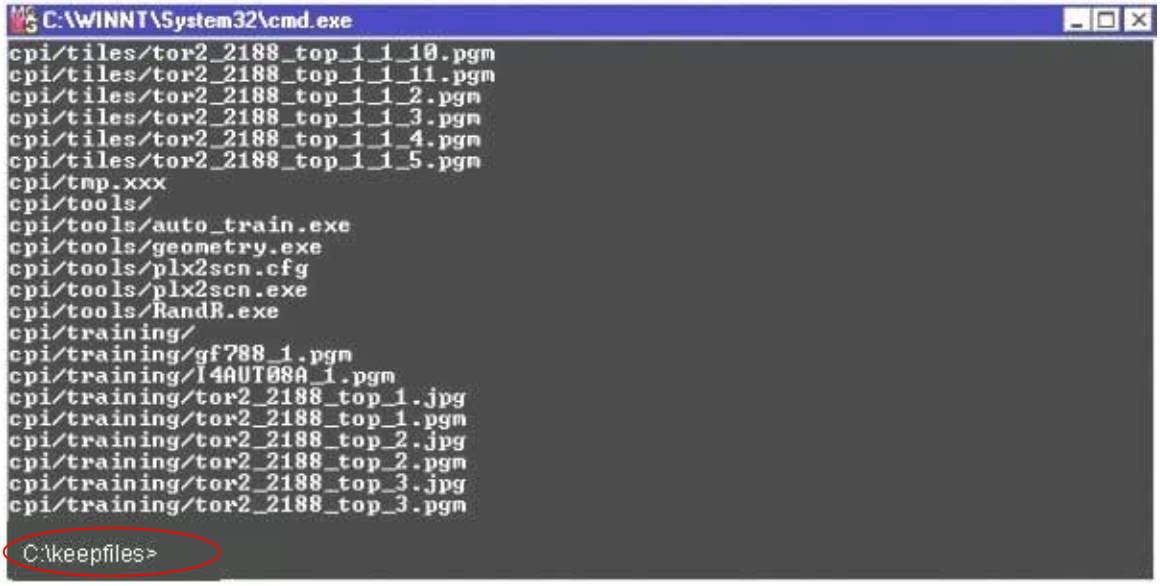


Figure 1-20 Restore Operation is Complete

To end the '**Restore'** operation, click the close icon in the corner of the command prompt window.

1.5 Restoring the Registry

To restore the backup Registry, carry out the following steps:

1. Click **Start -> Agilent Restore Backup** and log in as shown in section1.4.

2. Select the '**Restore Registry'** option and click the **Restore** button.

3. The '**Restore Registry'** menu option is displayed in Figure 1-21.

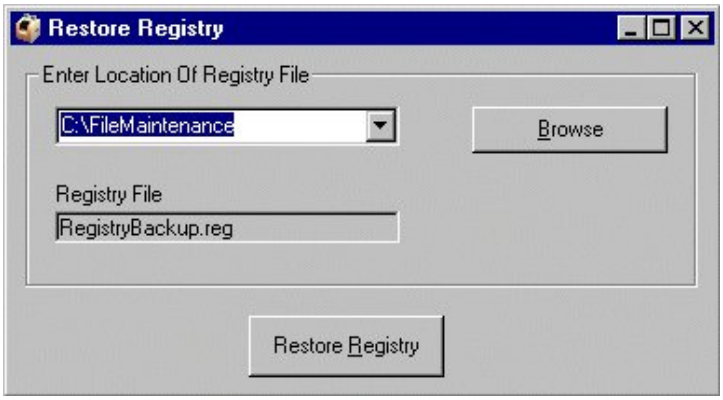


Figure 1-21 Restore Registry Editor Menu

4. Select the location of the Registry backup using the **Browse** button.

5. If the backup registry file ***RegistryBackup.reg*** is not located, the following error message is displayed:

Figure 1-22 RegistryBackup.reg Does not Exist

6. Click **OK** to return to step 4.

7. If the **\HKEY_LOCAL_MACHINE\SOFTWARE\MV Technology** Registry key already exists, then the Registry settings, before you clicked the **Restore Registry** button, are backed up to the location specified by the '**BackupDirectory'** setting. The following message is displayed:

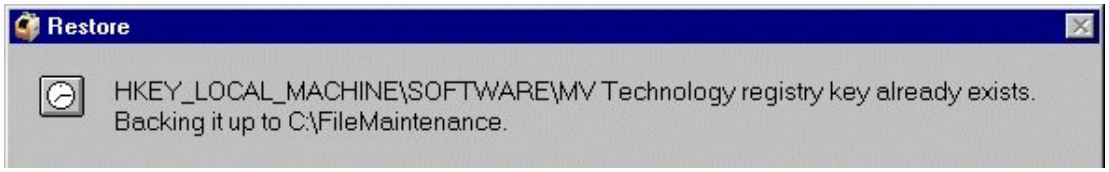


Figure 1-23 Backing Up Registry Editor Message

8. When the '**Restore'** operation is complete, the following informative message is displayed:

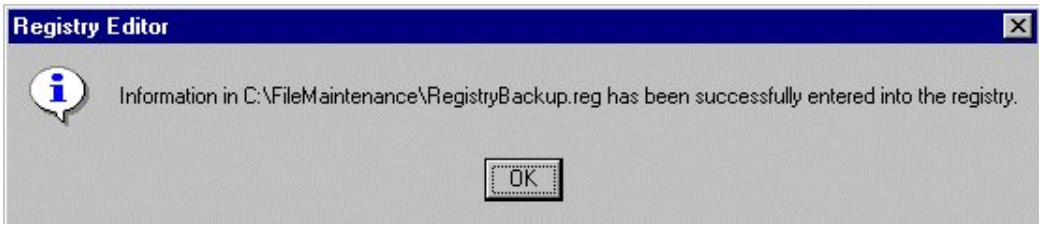


Figure 1-24 Registry Editor Successfully Backed Up Message

You can also check that the '**Restore'** operation is complete by seeing if the ***RegistryBackup.reg*** file has been replaced by the ***ExistingRegistryBackup.reg*** file. The ***RegistryBackup.reg*** file will not be present in the **Backup** directory again until the next Registry backup has been completed.

2 Correlation for Large ICs

There is a new location mode for locating the rows of leads from IC components broken up in multiple views. This is a correlation-based method, which allows for a more robust and quicker location of the row of leads.

- It uses the edge between the body and the beginning of the leads. This edge allows for a good location of the top of the leads, and of the ends of the leads, which are required for joint analysis.

- It uses the pitch (distance between the centres of leads) value specified by the user, but allows for a variation of the pitch of up to 3%. This is to compensate for variation in the pitch of the row of leads, as there is often a slight difference between the pitch at the top of the leads and the bottom of the leads.

  This correlation method is different from the one used for single view ICs and introduced in GUI 4.05. It does not inspect the leads in different channels but is used to adjust the lead pitch, hence ensure a better location of the leads. It is available for both pre and post reflow.

2.1 Aspects of Locating Leads

1. The **Linear Correlation** algorithm is used to locate the start of the leads at several locations on the component. This is used to determine the edge of the component.

2. Locations are identified as the area(s) within the green box(es).

3. The number of leads determines the number of locations. This is defined as follows:

If there are more than 17 leads in a row, three location areas are used (start, middle and end of the row) as shown in Figure 2-1:

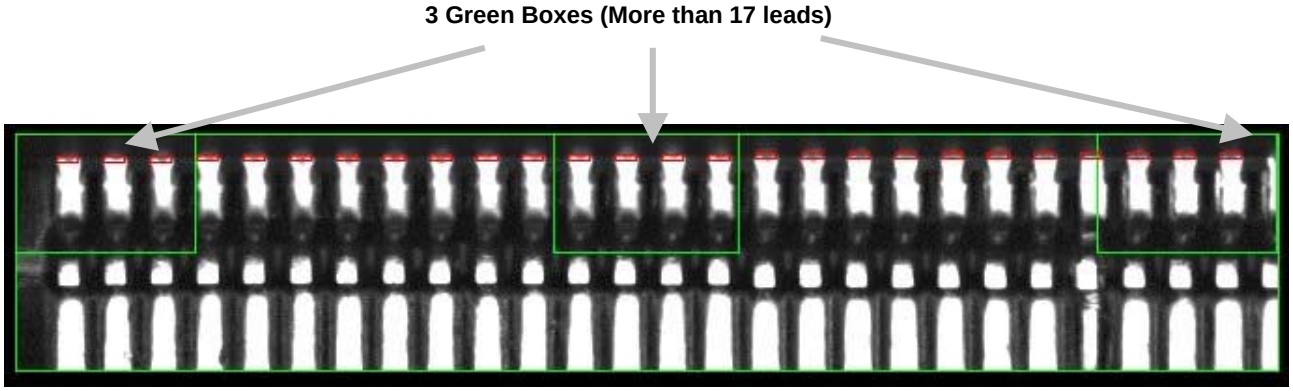


Figure 2-1 Three Location Areas – More Than 17 Leads

If there are 6 – 17 leads in a row, two location areas are used (start and end of a row) as shown in Figure 2-2:

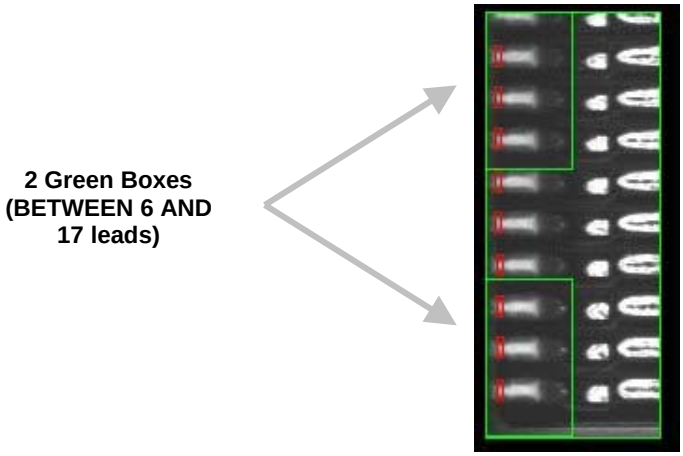


Figure 2-2 Two Location Areas - Between 6 and 17 Leads

If there are less than 6 leads in a row, there is only one location area, encompassing the entire row. This is illustrated in Figure 2-3:

Figure 2-3 One Location Area - Less than 6 Leads

4. After determining the edge, the algorithm automatically calculates the pitch between the leads.

5. You can choose to check the presence/absence or not. The presence value calculation is based on the brightness of the box-filter readings. To disable presence/absence functionality, set the parameter **Presence Large IC** to **0**. **Therefore, if Presence Large IC = 0, then there is no presence check performed.**

   Presence Large IC only works in Post Reflow.

   If Presence Large IC is not activated, the length of the lead boxes located on the top and on the bottom of the leads is set to 1/3 of the lead length. This is illustrated as shown in figure 2-4:

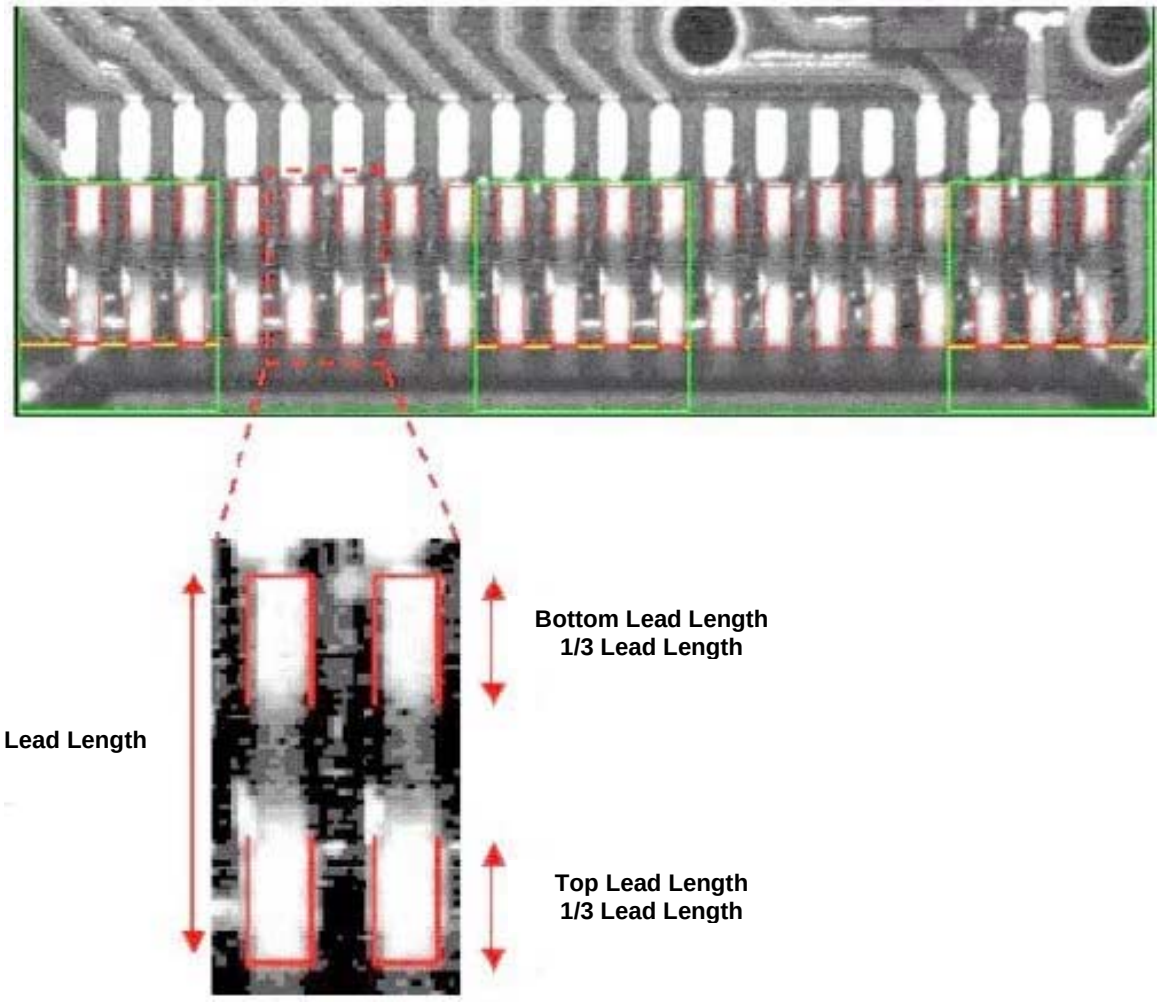


Figure 2-4 Presence Check Not Done

6. If presence check is done (Presence Large IC activated), you need to:
    1. Set the length of the green box (should be located on the slope, which is the dark area, of the leads) using the parameter **Green Box Length**.
    2. Offset the position of the green box (it should be on the slope of the leads in Post-reflow) from the top of the lead. **Green Box Shift** parameter is the green box offset in microns from the top of the lead (body of the component) to the end of the lead.
    Illustration 2-5 shows a case of a location with a presence check:

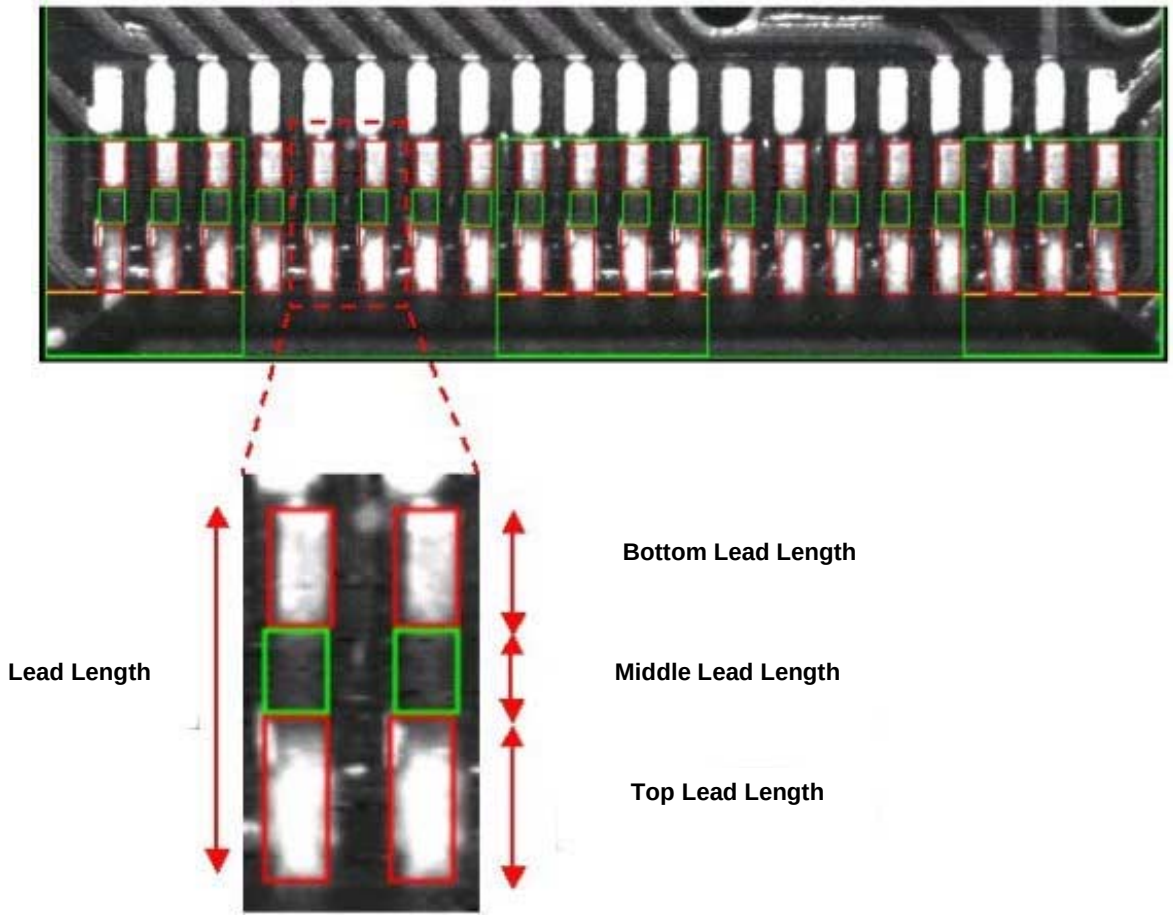
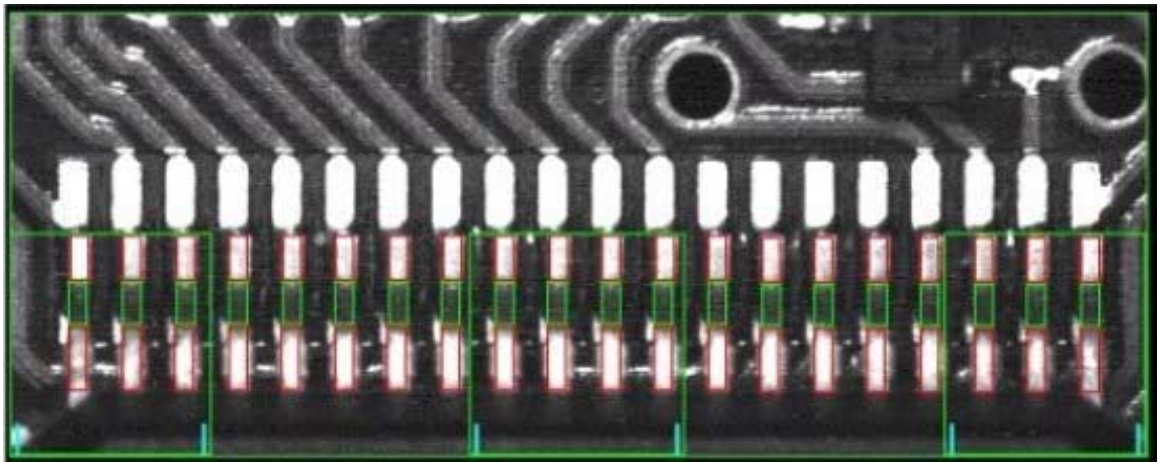


Figure 2-5 Presence Check Done

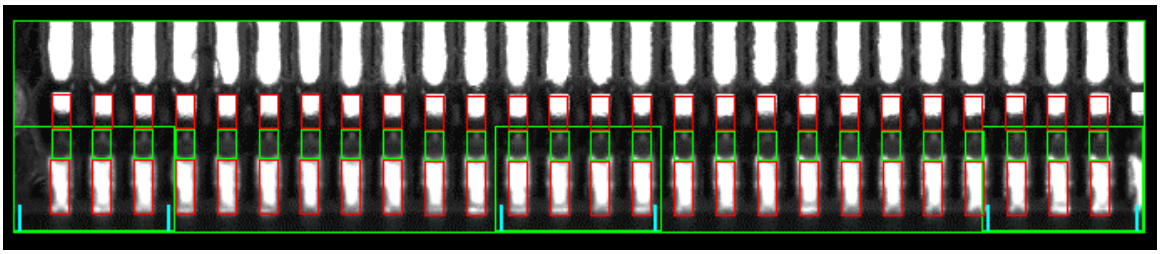
7. The presence score is calculated as follows:

```
Presence Score =
Mean of intensity of the red boxes (which are the leads)
- Mean of intensity of the green box (which are the pads)
```

Important Note: Enlarge the inspection area to ensure that edge inspection is done correctly. Part of the component body must be within the search area and the distance between the edge and the border of the image should be over 15 pixels long.
If the cyan line overlaps with the red boxes for the lead, then the search area is too small.
This is illustrated in Figure 2-6:



Good example



Bad example (Cyan lines overlap with the leads)

Figure 2-6 Enlarge Inspection Area

2.2 Step by Step on Locating the Leads using Correlation Location Algorithm

If you are not using presence/absence functionality:

1. Select an SOIC or QFP component.

2. Right-click the device and open the **Device Editor** by selected **Edit -> Device Type**.

3. Set the **Multiple View** parameter. There are two options:

    a. If the component is outside the field of view, you can view each row of leads on the component and record the results separately in the .plx file. This is done by setting the parameter '**Multiple Views'** to **1**.
    b. If the component is inside the field of views, you can view each row of leads, but then merge the results so there is only one line indicating the result in the ***.plx*** file.
    This is done by setting the parameter '**Multiple Views'** to **16**.

4. Enable the Correlation Location functionality by setting the parameter '**Correlation Location'** to **1**. It is set to **0** by default.

5. Manually set the length of the red box by setting the parameter '**Red Box Length'**.

6. The length of the red box should encompass the bright parts of the leads at the top and at the bottom as shown in Figure 2-7:

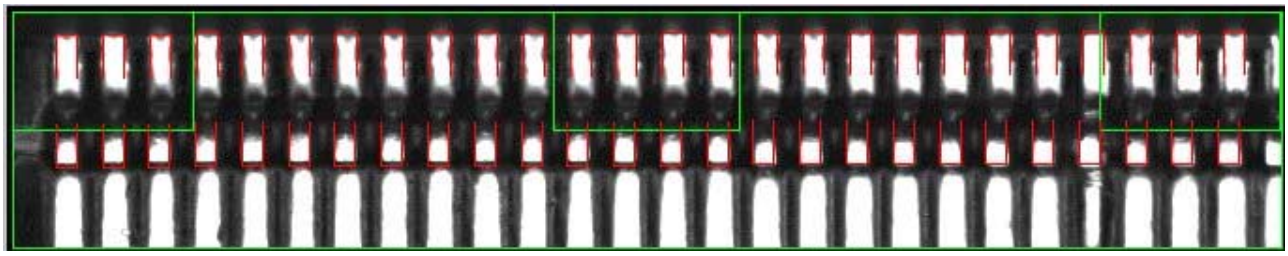


Figure 2-7 Length of Red Box Encompassing the Bright Top and Bottom Parts of Leads

7. Enter a **Lead Pitch** value. This correct value is automatically determined by the system, after inspection has taken place.

8. Enable correlation training by setting the parameter '**Correlation Training'** to **1**.

9. Press the **Inspect** button on the Device Editor and save changes.

10. Open the Device Editor again – a new and more appropriate **Lead Pitch** value will have been entered by the system.

    The **Lead Pitch** value is automatically determined by the system.

If you are using presence/absence functionality:

1. Carry out steps 1 – 8 above.

2. Enable presence/absence functionality by setting the parameter '**Presence Large IC'** to 1.This setting enables the system to check the location and presence of the component. **This is only applicable for post-reflow**. (In pre-reflow only location is checked).

3. Set an appropriate presence threshold in the **Thresholds** menu. The presence score should be **200**.

4. Set the '**Green Box Shift'** parameter to a consistent value. The box should be located on the slope of the leads which is the dark area as shown in the following illustration 2-8:

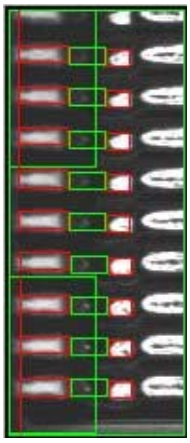


Figure 2-8 Green Box Shift

5. Set the '**Green Box Length'** parameter to a consistent value.

6. Enter a **Lead Pitch** value. This correct value is automatically determined by the system, after inspection has taken place.

7. Enable correlation training by setting the parameter '**Correlation Training'** to **1**.

8. Press the **Inspect** button on the Device Editor and save changes.

9. Open the Device Editor again – a new and more appropriate **Lead Pitch** value will have been entered by the system.

    The **Lead Pitch** value is automatically determined by the system.

3 Lighting Controller (SJ50s only)

There is a new lighting system in the SJ50, which is controlled by the user using software, eliminating the user having to physically adjust the LEDs every three weeks.

The **Lighting Controller** menu in the GUI is accessed from the **Tools** menu in the main toolbar of the SJ50 GUI. For more information on using this menu, refer to 3.3:

3.1 Enabling the Lighting Controller Tools Menu

1. Click **Start -> Run**, insert '**regedit'** in the **Open** dialogue, and click **OK**.

2. Go to **\HKEY_LOCAL_MACHINE\SOFTWARE\MV Technology\GS-1\LightingController** in the Registry Editor.

3. Double-click the **Enabled** icon and enter the value **1** to enable the menu. The value **0** (default) disables it.

3.2 Configuring the Lighting Controller Settings

1. Click **Start -> Run**, insert '**regedit'** in the **Open** dialogue, and click **OK**.

2. Go to **\HKEY_LOCAL_MACHINE\SOFTWARE\MV Technology\GS-1\LightingController\Default**.

3. Double-click the **SerialPort** icon and enter the value **COM1**. This value specifies which COM port the **Lighting Controller** is connected to.

4. Double-click the **BaudRate** icon and enter the value **9600**, which specifies the baud rate[1] to be used when communicating with the **Lighting Controller**.

5. Leave the **Parity** setting with the default value **None**.

6. Double-click the **ByteSize** icon and enter the value **8**, which specifies the number of data bits in each byte for the **Lighting Controller**.

7. Leave the **StopBits** setting at **0**.

8. Double-click the **LogEnabled** icon. This setting is used to specify what is recorded in the ***LightingController.log*** file in ***C:\cpi\log***. The values associated with this setting are as follows:

   0 – Neither events or errors are logged to the ***LightingController.log*** file.
   1 – All **Lighting Controller** errors are logged to the ***LightingController.log*** file.
   2 - All **Lighting Controller** errors and events are logged to the ***LightingController.log*** file.

[1] Signalling rate of a line, which is the number of transitions (voltage or frequency changes) that are made per second.

The GUI software should not be running when you are changing the Registry settings.

3.3 Using the Lighting Controller Menu

The **Lighting Controller** menu is in the **Tools** menu of the GUI.

1. Open the **Tools** menu by clicking the **Tools** button in the main toolbar of the GUI.

2. Click **Camera -> Lighting Controller** in the **Category** section. The **Lighting Controller** menu is then displayed, as shown in Figure 3-1:

Figure 3-1 Tools -> Lighting Controller Menu

The **Lighting Controller** menu is comprised of:

- List of Led rings.
- The LED rings current output values (mA).
- Targets for each LED ring (in mean grey level).
- **Mean**, **Sigma** and **Range** values, which are displayed above the **Light Intensity Grid**.
  These values change as modifications are made to the **Lighting Controller** menu. And the changes are updated in C:\cpi\LightingConfiguration.xml.

3.3.1 Modifying the Lighting Controller Menu

1. To turn on a LED ring, check the associated box.

2. To change the Lighting value, you can change the current output values (**mA/4**) by either using the up/down arrows beside the field or typing in a number.

3. The **Light Intensity Grid** is updated continuously so you can see the changes as they take place on camera view.

4. Any lighting (**mA/4**) combinations of the various lighting rings can be used on condition they do not exceed **4000mA**.

5. If they do exceed **4000mA**, the following error message is displayed and only the checked (enabled) LED ring checkboxes are enabled so that you can reduce the value:

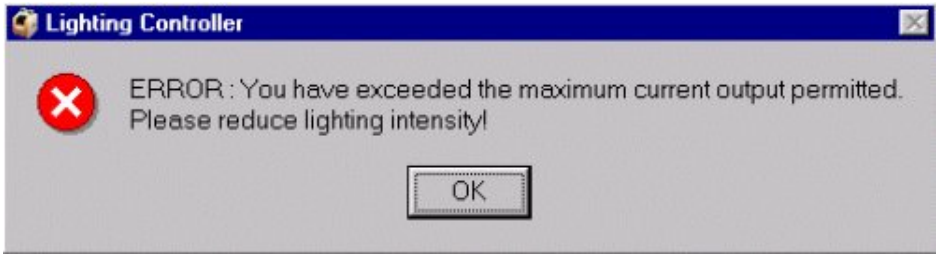


Figure 3-2 Maximum LED Output Exceeded

6. When you press **OK** on the error message, the up arrow on the scroll bar beside the lighting ring will be greyed out so that you can only use the down arrow.

7. This is because you have exceeded the **4000mA** limit and must reduce the current output value.

8. Click the down arrow to do this for one of the selected LEDs.

3.3.2 Undoing Changes Made to the Lighting Controller

Use the following steps to undo any changes you make to the Lighting Controller menu:

1. To undo (clear) any changes made to the Lighting Controller menu, click the Undo button and the following confirmation message is displayed:

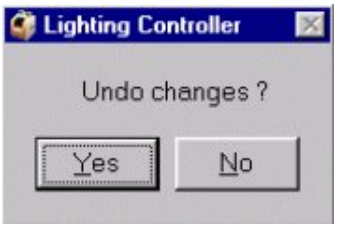


Figure 3-3 Undo Changes Dialogue

2. Click **Yes** to continue clearing the most recent changes or No to cancel the Undo operation.

3.3.3 Saving Changes Made to the Lighting Controller

When you have inserted the correct lighting values, close the **Lighting Controller** menu, and the following message is displayed asking you whether you want to save the changes you made to the Lighting set-up:

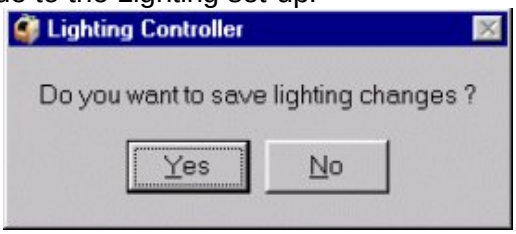


Figure 3-4 Save Lighting Changes Message

3.4 Required Files

Ensure the following files are present to run and manage the **Lighting Controller**.

3.4.1 LightingConfiguration.xml in C:\cpi\data

This file contains all the drive currents (**mA\4**) of the various LED rings and should not be modified. The contents of the file are shown in Figure 3-5:

```
- <PreMono>
    <LightingRing1 Name="80" Current="336" />
    <LightingRing2 Name="70" Current="459" />
    <LightingRing3 Name="60" Current="244" />
    <LightingRing4 Name="45C" Current="219" />
    <LightingRing5 Name="45B" Current="521" />
    <LightingRing6 Name="45A" Current="182" />
    <LightingRing7 Name="30B" Current="230" />
    <LightingRing8 Name="30A" Current="230" />
  </PreMono>
- <PreColour>
    <LightingRing1 Name="80" Current="336" />
    <LightingRing2 Name="70" Current="459" />
    <LightingRing3 Name="60" Current="244" />
    <LightingRing4 Name="45C" Current="219" />
```

Figure 3-5 LightingConfiguration.xml File

3.4.1.1. What is in the File?

The file is comprised of the currents for each LED ring based on mode.
There are 3 modes currently in use:

- Premono –shown in the sample extract in Figure 3-5 above.
- PreColour
- Post

For more information on modes, refer to the SJ-10 Engineering Mode Manual.

3.4.1.2. If the File Can Not be Found…

If the system cannot find this file when you open the **Lighting Controller** menu in **Tools**, the following error message is displayed:

Figure 3-6 LightingConfiguration.xml File is Missing Message

If this situation occurs, contact your Customer Support representative.

3.4.2 LightingControllerIntensityTargets.xml in C:\cpi\data.

This file contains the target mean that you should aim towards for each LED ring. This file cannot be modified. The contents of the file are displayed in Figure 3-7:

```
- <PreMono>
    <LightingRing Name="80" TargetGreyMean="80" />
    <LightingRing Name="70" TargetGreyMean="45" />
    <LightingRing Name="60" TargetGreyMean="65" />
    <LightingRing Name="45C" TargetGreyMean="110" />
    <LightingRing Name="45B" TargetGreyMean="110" />
    <LightingRing Name="45A" TargetGreyMean="100" />
    <LightingRing Name="30B" TargetGreyMean="100" />
    <LightingRing Name="30A" TargetGreyMean="100" />
  </PreMono>
- <PreColour>
    <LightingRing Name="80" TargetGreyMean="80" />
    <LightingRing Name="70" TargetGreyMean="45" />
    <LightingRing Name="60" TargetGreyMean="65" />
    <LightingRing Name="45C" TargetGreyMean="110" />
```

Figure 3-7 LightingControllerIntensityTargets.xml File