CoderCAM™

Evaluation Board Installation and Operation Manual

Version 1.9

7th April 2005

Revision Log

Revision No.	Description	Date
V0.9	Written and checked.	July 2004
V1.0	Redesigned the CoderCam manual.	23rd August 2004
V1.1	Reformatted after proof-reading by Moran	31st August 2004
V1.2	Added options for TC6030B0	5th September. 2004
V1.3	Revised	7th September. 2004
V1.4	Added options for TC5740	10th October. 2004
V1.5	Revised	1st November 2004
V1.6	Updated to include TC7030	10th November 2004
V1.7	Split the Kit Contents to VGA (CoderCam) and AlgoCam	22nd November 2004
V1.8	Updated to reflect new features in CoderCam 4.0.	6th January 2005
V1.9	Updated to reflect new features in CoderCam 5.0.	7th April 2005

Table of Contents

1. Introduction

CoderCam™ is a Windows-based GUI application that controls the TC-EVM units for all the TransChip sensor families (CoderCam, AlgoCam, 2 Megapixel AlgoCam). It enables you to capture still pictures and motion videos with a TransChip (TC) sensor, and to determine the format, size, degree of compression, camera controls and other parameters on the displayed image. The software is included in the TC-EVM kit.

☞ **The CoderCam family includes the VGA camera sensors (TC5740, TC5757). The AlgoCam family includes TC6030 with 1.3MP. The 2 Megapixel AlgoCam includes the TC7030 with two megapixels. The CoderCam software works with all of these families. There are two types of EVM boards. One for the CoderCam VGA family and the second for the both the AlgoCam families.**

This document describes how to assemble the TC-EVM kit and how to operate the CoderCam software.

1.1 Platform Requirements

The TC-EVM board can be connected to laptop or desktop computers, with the following minimum requirements:

1.1.1 Hardware

- Microprocessor Pentium III
- RAM (Random Access Memory) = 128MB
- VGA monitor
- Recommended: CD-ROM drive

The NEC USB controller (NEC-720101) has been found to be fully compatible with the TC-EVM board: NEC USB2 to PCI bridge and NEC USB2 PCMCIA (included in TC-EVM kit).

1.1.2 Software

TC-EVM boards and the CoderCam software operate under the following systems:

Windows XP – works well in all cases.

Windows 2000 – in most cases, CoderCam works well under Win2000, however, in some installations Win2000 may be missing a .dll (MSVCP60.DLL) which can cause CoderCam not to work

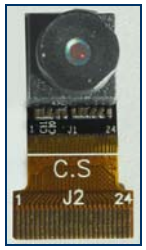
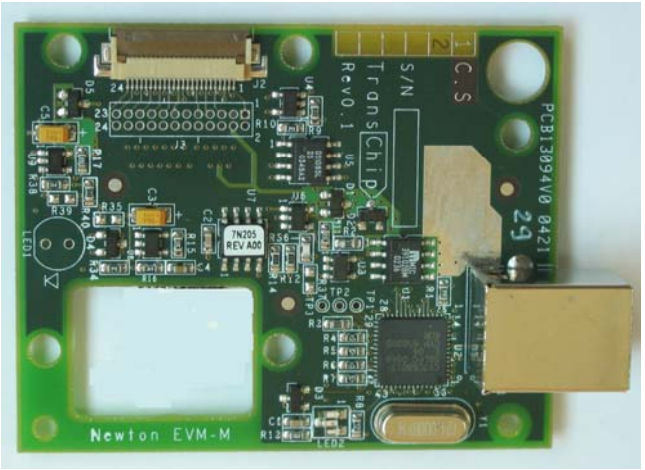
All other operating systems are **not** currently supported.

2. Contents of the TC-EVM Kit

2.1 EVM Kit for VGA (TC5700) Family

TC5740 Sensor 24-pin TCEV-5740-01 	**TC5747** Sensor 39-pin TCEV-5747-01 	**Adapter** 39 to 24pin TC5747A-24-39A 	**Tripod** 	**USB2** card for desktop **PC** 	**USB2** card & power supply for **laptop**  
EVM board for **TC5700** family 		Plastic **spacers** & **screws** 	**Support board** 		**USB2** cable 

2.2 EVM Kit for AlgoCam Family (TC6030/TC7030)

TC6030 Camera Sensor TC6030MF24D 	**TC7030 Camera Sensor** TC7030MF24A 	**Tripod** 	**USB2** card for desktop **PC** 
EVM board for **Megapixel ++** family TC6030/7030 sensors with 24-pin flex connector attach directly to the board 	**USB2** cable 		**USB2** card & power supply for **laptop**  

3. Hardware Installation

3.1 Installing the USB2 Card

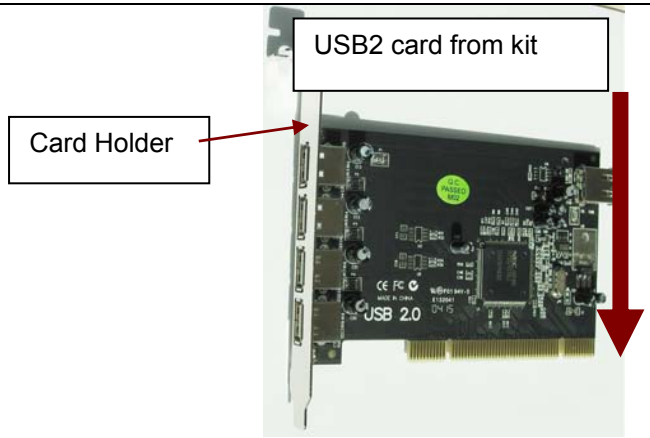
Two USB2 cards are supplied with the TC-EVM Kit, one for desktop PCs, the other for laptop computers.

Important

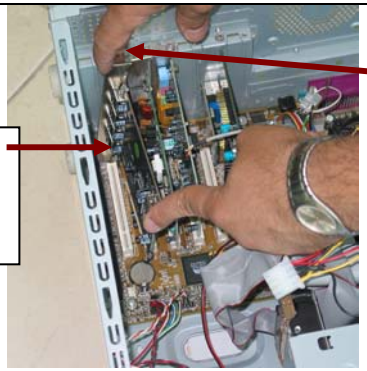
To ensure proper operation of the TC-EVM, you must use ONLY the parts supplied in the TC EVM kit. Even if you have a USB2 outlet in your computer, you should use the USB2 supplied with the kit; this card has been tested extensively and is known to be reliable.
If you are installing the USB2 on your laptop computer in a PCMCIA slot, you need to use an additional power supply as well, because the TC-EVM card needs more power than the laptop can supply.

3.1.1 USB2 for Desktop PC

This section describes how to install the USB2 card in a desktop computer, and how to check if it has been installed correctly.

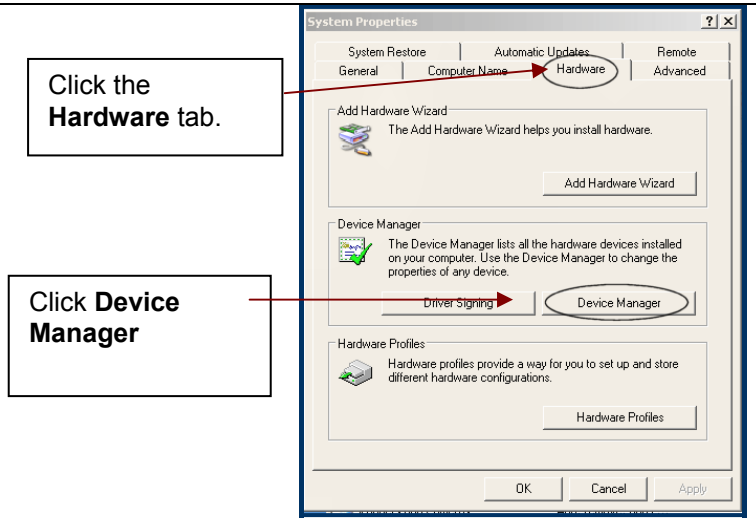
➢ Shut down • Click Start>Shut Down to shut down your desktop computer. Disconnect the power cable from the electric outlet. • Use a Philips screwdriver to open the desktop case.	

- Insert the USB2 card (from the TC EVM kit) into any one of the free slots on the motherboard. Press firmly into the slot and screw on the card holder (if a holder exists, remove it).
- Close your computer, reconnect to the main power outlet and boot the system.



➢ Check that the USB2 is connected properly, as described below:

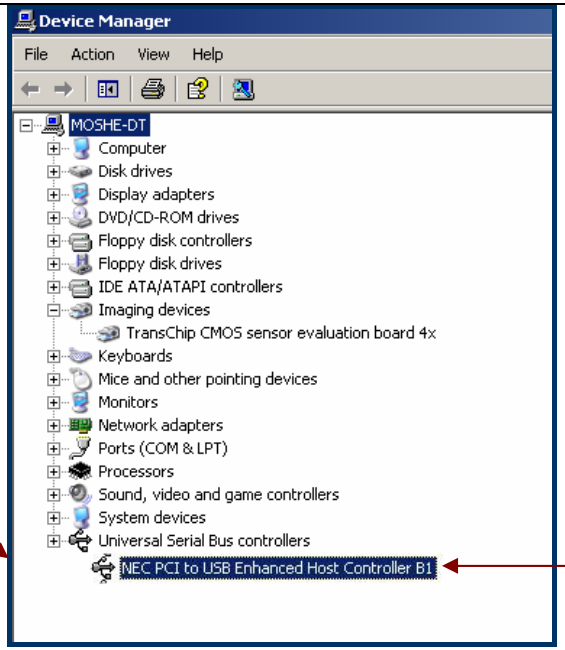
- After rebooting the computer, select **Start > Settings > Control Panel**.
- Select **System** and click the **Hardware** tab.
- Click on **Device Manager** to display a list of hardware devices active on your computer (see below).



➢ In the Device Manager window, check that USB2 Driver name appears.

- In the list of hardware devices that appears, click on:
  "Universal Serial Bus controllers"
  and check if the
  "**NEC PCI to USB Enhanced Host Controller xx**"
  device is displayed
  (where xx may appear as the controller version).

☹ If the device name is not displayed, shut down the computer, open the computer case and check if the USB2 card is firmly inserted in its slot, reboot and repeat the check.



3.1.2 USB2 for Laptop PC

This section describes how to install the USB2 card in a laptop computer, and to check in the Device Manager if it has been installed correctly.

➢ Shut down

- Click Start>Shutdown to shut down your desktop computer and disconnect it from the electric power outlet.

USB2 card for laptops

- Insert the PCMCIA USB2 card (from the TC EVM kit) and connect the power supply unit.

☝ Installing the power supply is essential. The PCMCIA USB2 card does not generate sufficient electric power to supply the TC-EVM.

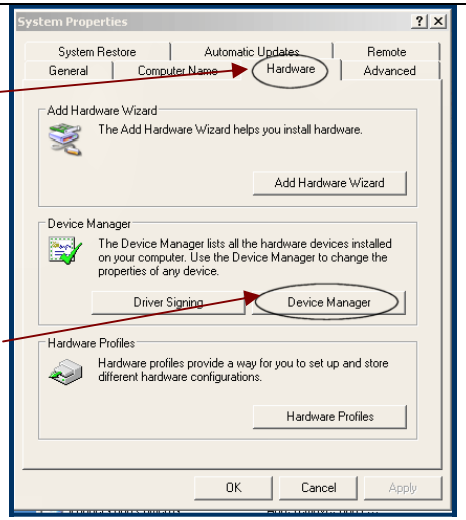
Insert USB2 card in laptop, press it in firmly. Connect power supply.

➢ Check that the USB2 card is properly connected:

- After rebooting the computer, select **Start > Settings > Control Panel**.
- Select **System,** and click the **Hardware** tab.
- Click on the **Device Manager** button to display a list of hardware devices active on your computer (see below).

Select the Hardware tab.

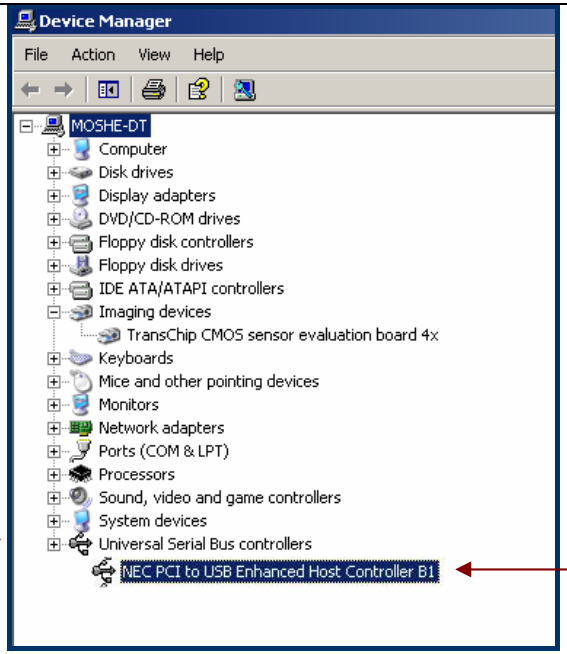
Click on the Device Manager button



➢ In the Device Manager window, check that the USB2 card is recognized.

- In the list of hardware devices that appears, click on "Universal Serial Bus controllers" and check if the TransChip USB2 device is displayed as:
  "**NEC PCI to USB Enhanced Host Controller xx**".
  (where **xx** is the version number.)

☹ If the above is not displayed, shut down the computer, and check if the USB2 card is inserted properly in its slot, then repeat the installation procedure, as described above.



3.2 Assembling the TC-EVM Unit

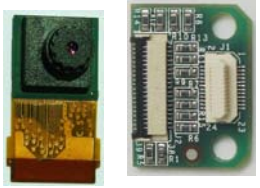
3.2.1 TC Camera Sensors

➢ Three types of TC camera sensors are available:

1. TC5740 VGA sensor (uses 24-pin board to board connector)
2. TC5747 VGA sensor (with flex 39-pin, uses 39-pin to 24-pin adapter)
3. TC6030 1.3MP sensor (with flex 24-pin connects directly to EVM board)
4. TC5740 (MF24D, MF24G, MF24F) VGA sensor (with flex 24-pin, directly to EVM board). See TC5740-MF24 Connection Options
5. TC7030 2.0MP UXGA sensor (with flex 24-pin, directly to EVM board), similar to TC6030..

The general procedure of assembling the TC-EVM unit that applies to all three camera sensors is described below.

TC5740MB24B sensor
24-pin connects directly to EVM board

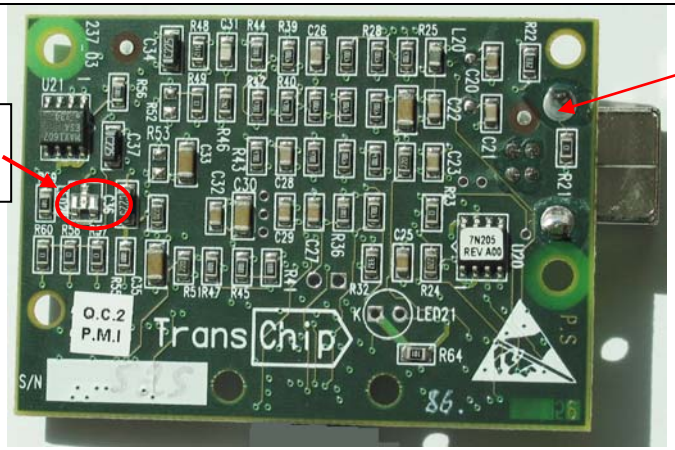


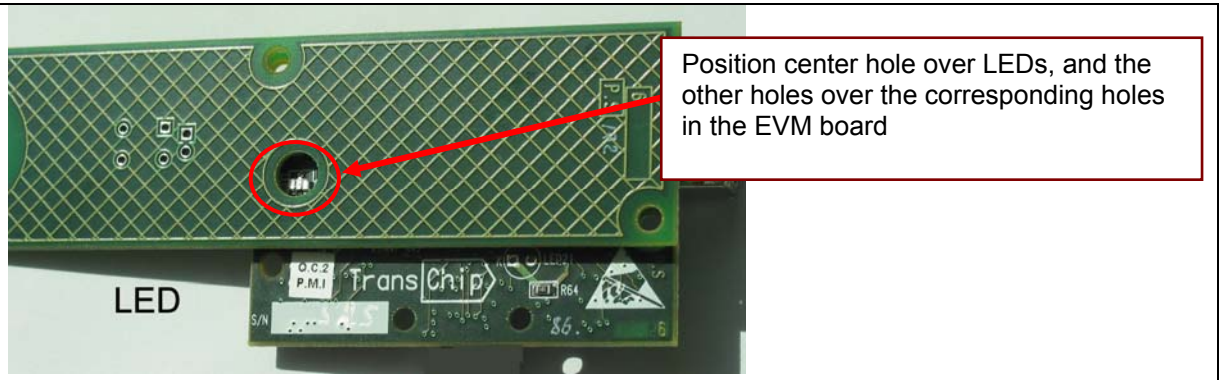
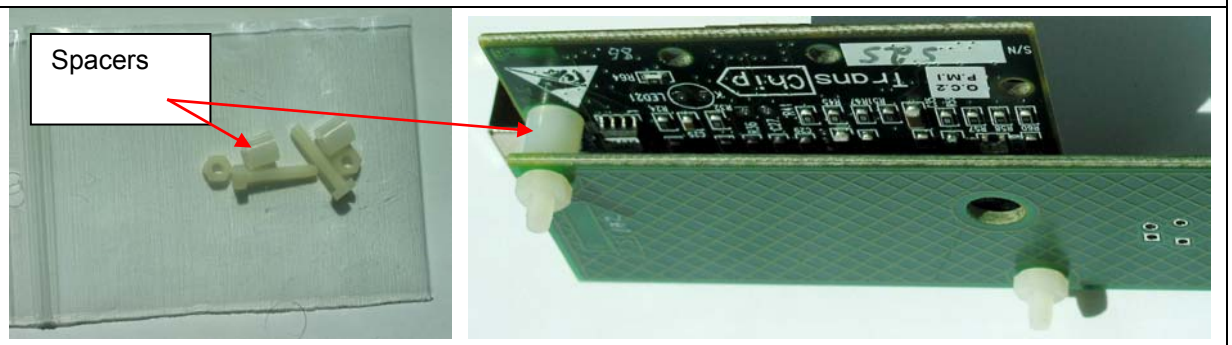
TC5747MF39 sensor
Flex 39-pin connects to EVM board via 39- to 24-pin adapter

TC6030 / TC7030
Flex connects directly to 24-pin on board

3.2.2 Attaching the Support Board (for the EVM TC5700 Family)

- Find the LEDs on the TC-EVM backside (see figure to the right).



• Position the holder with the center hole over the LEDs, and the other two holes over the corresponding holes on the TC-EVM board.	
• Use the plastic screws with spacers to attach the Support board to the TC-EVM board. Insert the spacers between the board and the holder. • Gently tighten the plastic screws.	

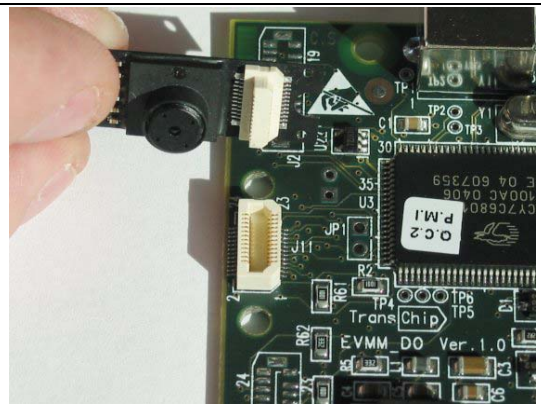
For a description of connection of other types of TC5700 sensors, see TC5740-MF24 Connection Options.

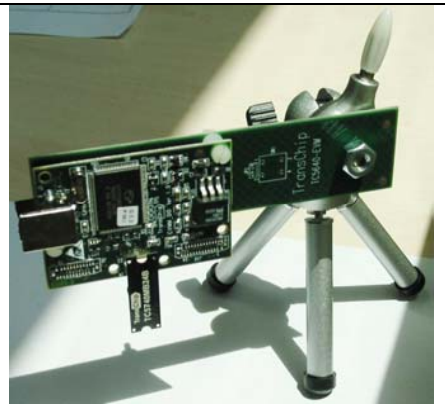
- *You have now completed the assembly of the TC-EVM. in the next subsections you have a choice of connections that is dependant upon the TC camera sensor model and the type of connector.*

3.2.3 Connecting the TC5740MB24B Sensor to the TC- EVM Board

- Press the TC-5740 sensor connector into the 24-pin connector on board.
- Attach the assembled board to the tripod (as shown in the figure).
- Remove the lens sticker and take care not to contaminate the lens surface.

☝ Do not attach the USB2 cable from the TC-EVM unit to the computer yet; it needs to be done only after installing the CoderCam™ software.

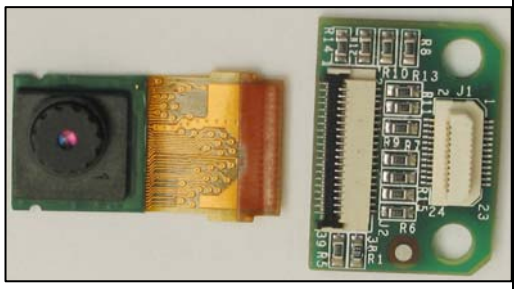




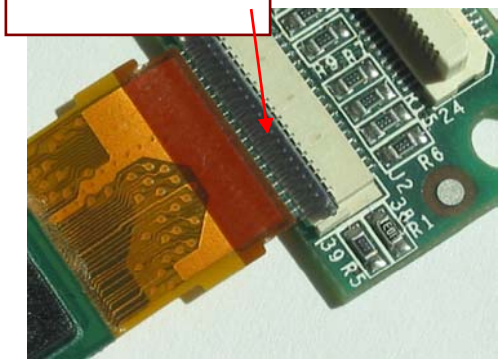
3.2.4 Connecting the TC5747 Sensor to the Adapter / TC-EVM

The 39-pin TC camera sensor requires a 39-to-24-pin adapter for attaching to the TC-EVM board.

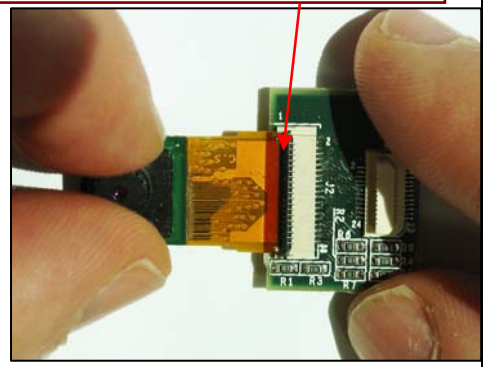
- Before inserting the flex connector of the TC camera sensor into the adapter, lift up the clamp until it is 900 to the surface, insert the flex connector all the way to the end and press down firmly on the clamp to close it.



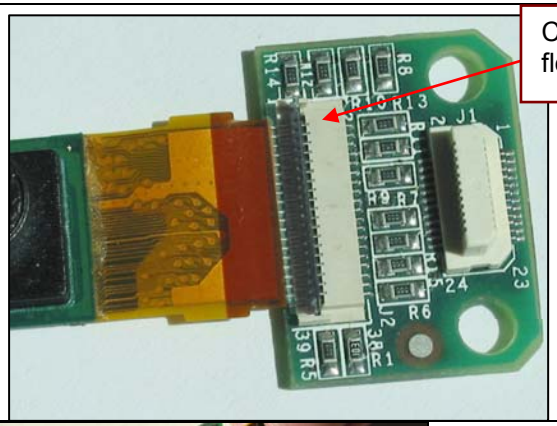
Open clamp all the way up (90^0)



Push the flex connector into slot until it reaches the end.

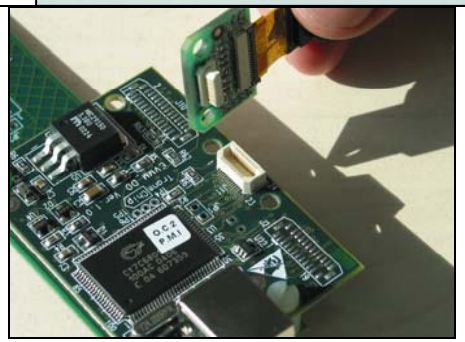


- Press the clamp hard to close on the flex connector and lock it in place.

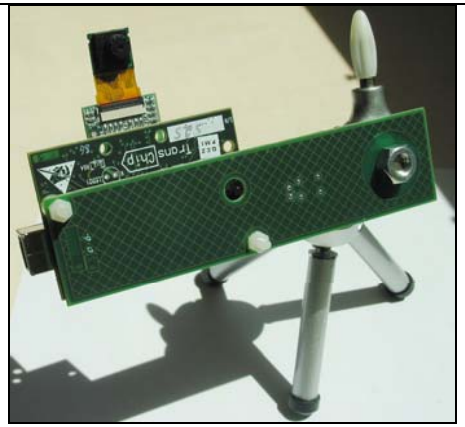


Close clamp on flex connector.

- Press the TC5747 Sensor connector into the connector on the TC-EVM Board

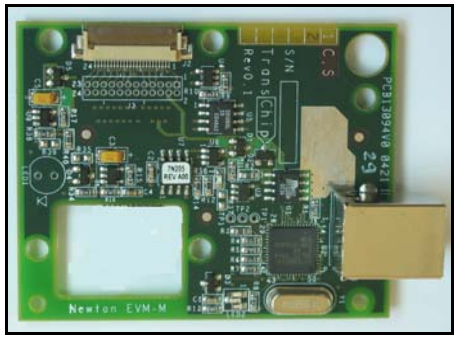


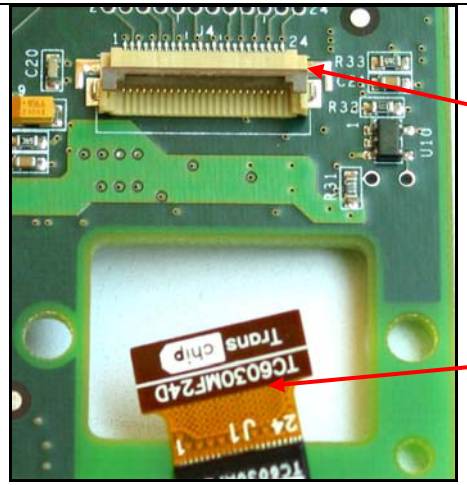
- Attach the assembled board to the tripod (as shown in the figure).
- Do not attach the USB2 cable from the TC-EVM unit to the computer yet; it needs to be done only after installing the CoderCam software.



3.2.5 Connecting the TC6030/TC7030 Camera Sensor

EVM-TC6030/TC7030 board – top side



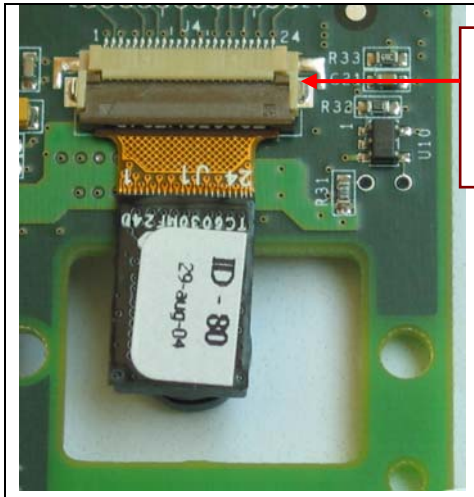


EVM-TC6030/TC7030 board – back side.

1. Open the clamp on the connector all the way up (90^0 to surface of board)

TC6030 camera sensor with lens face down.

Connecting theTC7030 sensor is a similar procedure.



2. Insert flex connector into back board connector and close the clamp firmly.

Do not attach the USB2 cable from the TC-EVM unit to the computer yet; it needs to be done only after installing the CoderCam software.

3. Attach the TC-EVM board to the tripod. Note that there is no need to attach a support board. The tripod screws on directly to the EVM board.

4. Software Installation

This section describes the procedure of installing the CoderCam software.

Before installing the CoderCam software, you need to configure the video display, as described in the first step below:

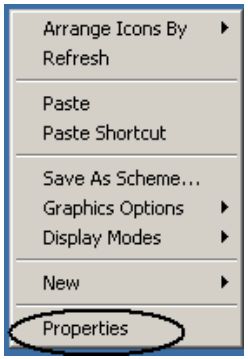
4.1 Configuration of the Video Display

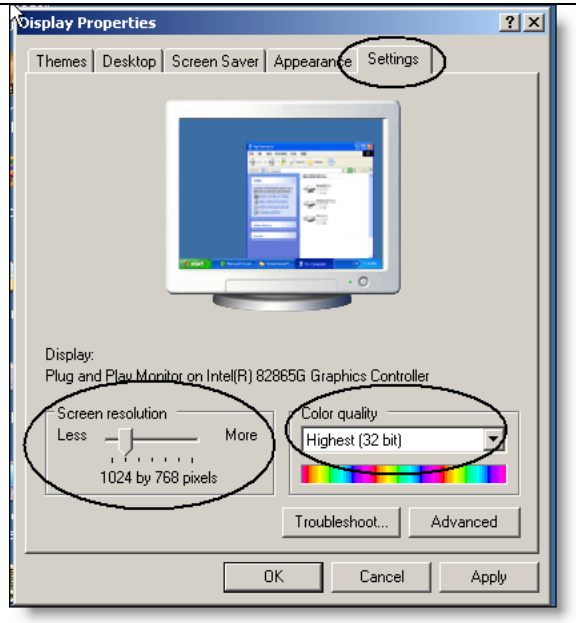
➢ Set the video Display properties, as described below:

Recommended: **1024x768** and **32-bit color** for average monitors. However, you may set the display to fit your computer monitor.

- Right-click on the Windows desktop and select **Properties**.
- In the Display Properties window, select the **Settings** tab and set **Screen Resolution** = 1024x768 and "**Color Quality** = 32-bit.
- Click **OK**.

Older hardware may require a lower quality color setting, such as 16 bit.



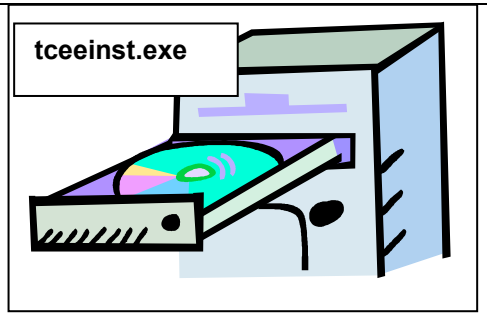


➢ Check that the TC-EVM unit is NOT connected to the computer via the USB2 cable.

➢ Run "**tceeinst.exe**" from the installation CD, as follows:

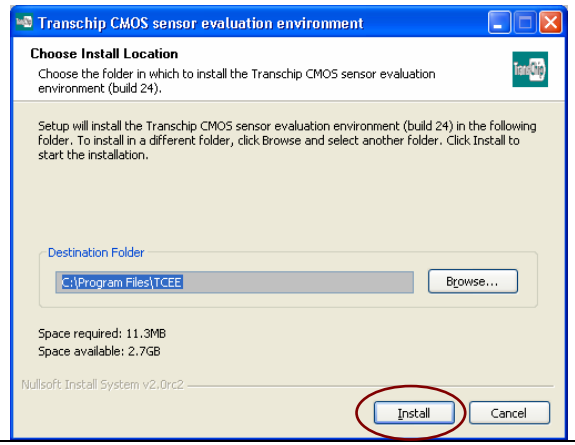
- Insert the installation CD and wait a few seconds for the Explorer window to appear, displaying the contents of the CD.
- Double-click **tceeinst.exe.**

☝ If you downloaded the installation program (**tceeinst.exe**) via the internet or some other method, the procedure is similar to that of installing from the CD.



➢ The "Choose Install Location" option appears.

- Either accept the default destination folder or select another (click Browse and navigate to the required folder).
- Click "**Install**" to start the installation procedure.
- A window may appear prompting you to "Continue Anyway". Click "**Continue Anyway**" (this may happen more than once).



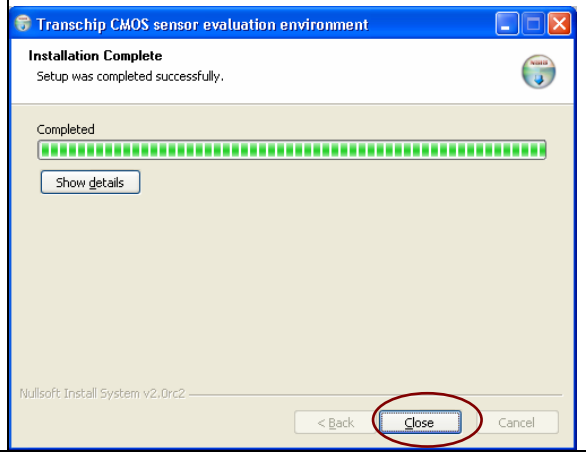
To cancel installation, click Cancel at any stage

➢ Wait for "Setup was completed successfully." to appear at the top of the window:

- Click "**Close**" to complete the Installation.

Setup is now complete; proceed to "Connecting TC-EVM to USB2" and "Driver Installation". under one of the following operating systems:

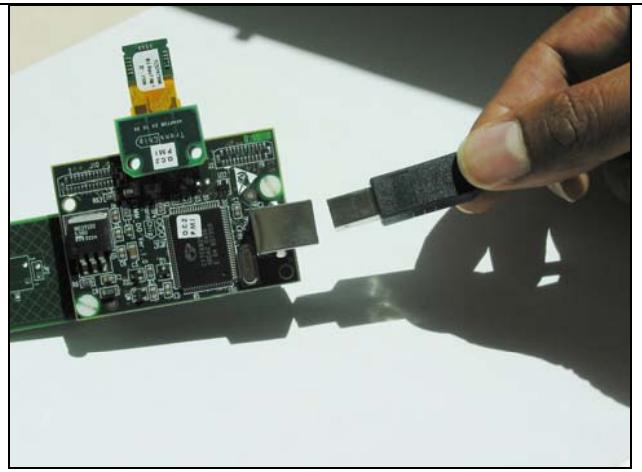
- Windows 2000
- Windows XP



4.2 Connecting the TC-EVM (VGA Family) to the USB2

- Connect the TC-EVM to the USB2 card with the USB2 cable (make sure you are connecting to the port of the USB2 card you installed from the TransChip kit).

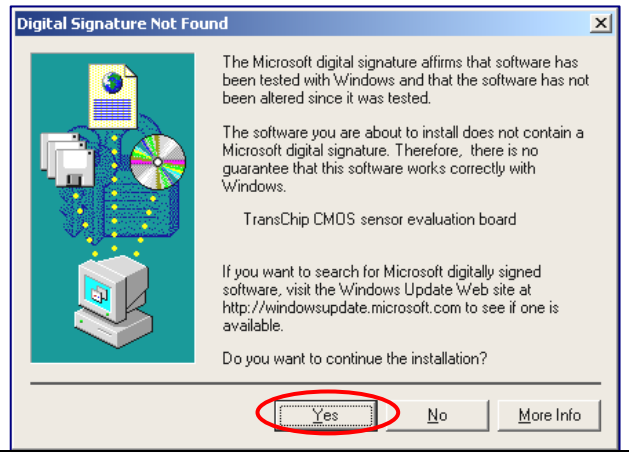
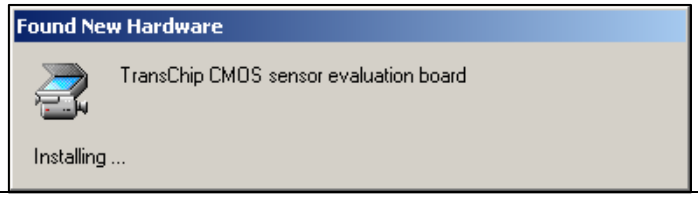
☝ When attaching or detaching the TC camera sensor to / from the TC-EVM board, always disconnect the USB2 cable.



4.3 Driver Installation

Depending on your platform (Windows 2000 or XP), go to the appropriate section below:

4.3.1 Windows 2000 - Automatic Driver Installation

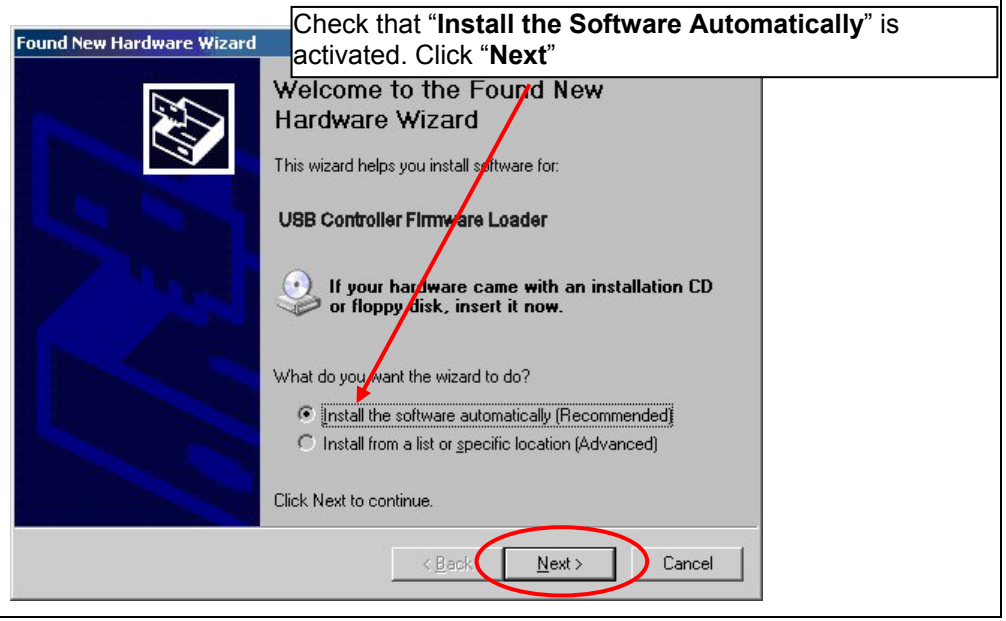
➢ After connecting the TC-EVM board with the camera sensor and it has been recognized by the system, the "Found New Hardware" window appears.	
➢ After a few seconds, the "Digital Signature Not Found" window may appear. Click **Yes** to continue.	
➢ The installation process continues. ■ *It ends automatically without displaying a message and the "Found New Hardware" window disappears.*	

4.3.2 Windows XP – Automatic Driver Installation

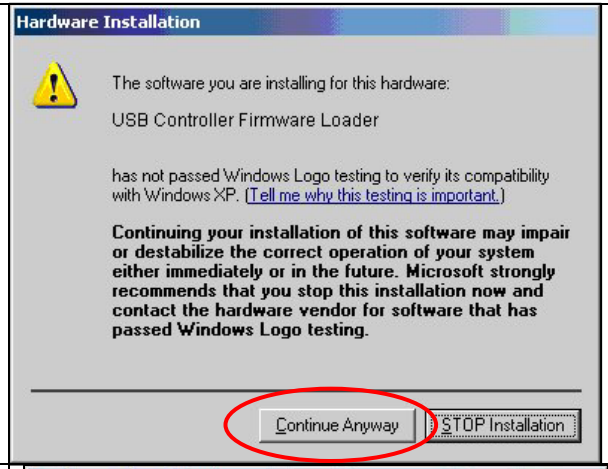
After connecting the Evaluation Board to the USB2 card with the USB2 cable, the system recognizes the new hardware, and the "Found New Hardware" window appears.

- Choose to install the software automatically.

- Click **Next**. (after checking that the "**Install the Software Automatically**" is activated.



- After a few seconds, the “Hardware Installation” window appears – click “**Continue Anyway**”.



- Installation continues.
- After completion, click **Finish**.

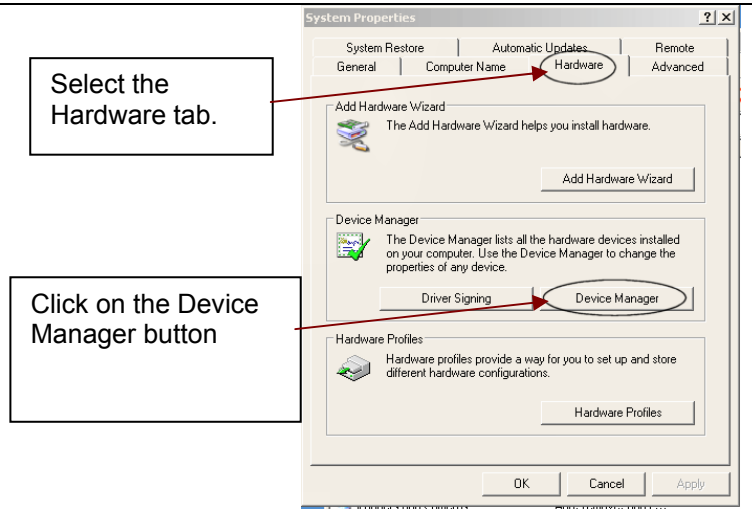
➢ Second Phase of Win XP Driver Installation.

- For the second time, a "Found New Hardware" window appears**.** Repeat the steps above until the second installation phase is completed.
- Click **Finish** at the end of the process.

4.4 Recognizing the TC Camera Sensor

This procedure describes how to check whether the computer recognizes the TC camera sensor.

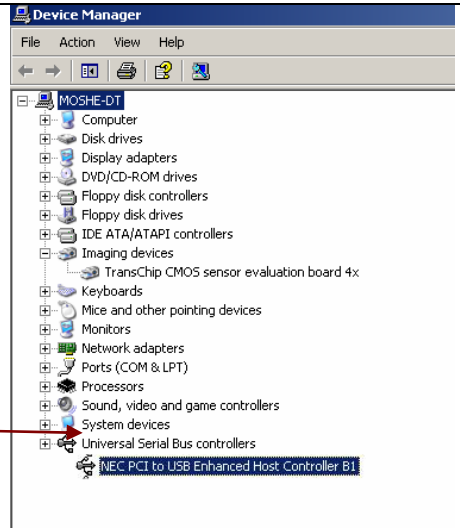
- Select Start > Settings > Control Panel.
- Select System, and select the **Hardware** tab.
- Click on the **Device Manager** button to display a list of hardware devices active on your computer (see figure to the right).



- If the image TC camera sensor is properly connected you will see "**Imaging Devices**" appear in the list of hardware devices. Under it appears:

TransChip CMOS sensor evaluation board 4x

Where 4x may appear as the version number.



Check that the USB2 cable is disconnected from the TC-EVM board and proceed to launch the CoderCam program. The reason for connecting after installation of the program is to observe the "Connecting" message that appears

4.5 Post-Installation

Successful completion of the installation automatically generates a "TransChip" folder under the Start Menu folder, and a TransChip icon on the desktop.

- Select **Start → Programs → TransChip**.

The following options are available:

- **Doc** – to open the user manual and other documents.
- **CoderCam** – to operate the TransChip CoderCam program.
- **Uninst** – to uninstall the CoderCam evalutation program.

5. The CoderCAM™ Interface

5.1 Quick Start

Select **Start → Programs →TransChip**  **CoderCam**.

After launching the CoderCam program, the main screen is displayed.

- Connect the TC-EVM board via its USB2 cable.

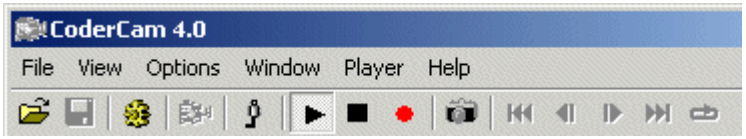
An “Initializing” message appears in the Status Bar at the bottom of the screen.

- If the Device Ready message appears after about 10 seconds or longer, the chances are that the connection is OK.
- If the message Device Ready appears too quickly after the Connecting message (within 3 seconds), there is a problem (see Troubleshooting Appendix).

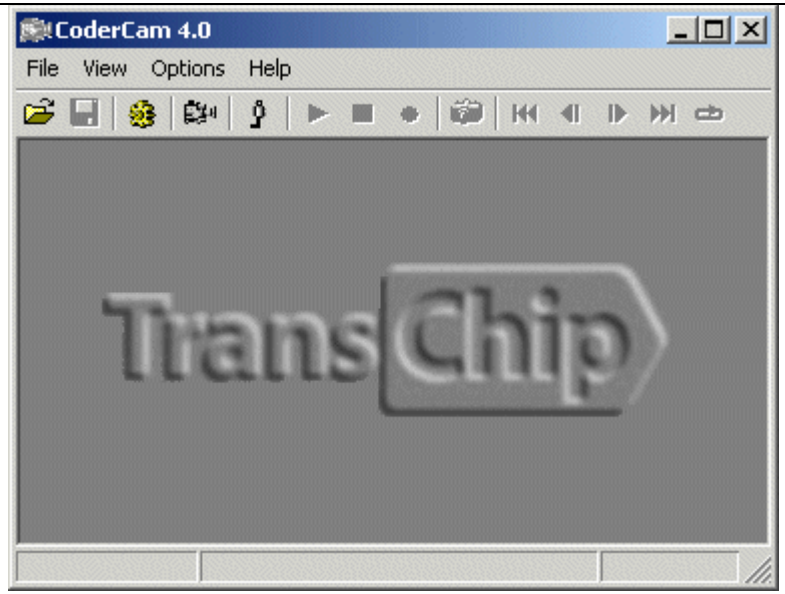
☝ “Device Ready” remains displayed until a Live Video window is opened.

☝ You may connect the TC-EVM either before or after you launch the CoderCam program.

The CoderCam window appears (see figure on the right)
The menu and toolbar are displayed as below:



For a full description of the menu options and the icons, see (**CoderCam Window – Options Icons and Shortcuts**)



- Click the Live Video icon  or press Ctrl + V.
  A live video picture appears on your computer display, as received by the TC camera sensor without compression.
- Point the TC-EVM camera sensor at different physical objects to see how they appear on the computer display.

5.2 Links to Functions

The list below contains links to the detailed explanations of the functions:

Configuration of the Picture Display on Page 29 To specify the output format, picture display size, Bayer representation, compression, internal JPEG and display orientation.	**Viewing Live Video - Procedure - Page 34** To view a live image as transmitted from the TC camera sensor, or to compare a compressed-then-uncompressed image with the sensor output.	**Device Properties – Page 34** To specify the brightness, contrast, etc. of the image, to apply digital effects (negative, sepia, …), and to execute the capture of a displayed image.	**Operating Live Motion Video – Page 39** To record and play live motion video.
CoderCam Window – Options Icons and Shortcuts – Page 41 Explains the function of all the icons, menu bars and status bars in the main window.	**Appendix – Troubleshooting– Page 44** Solutions to common problems.		

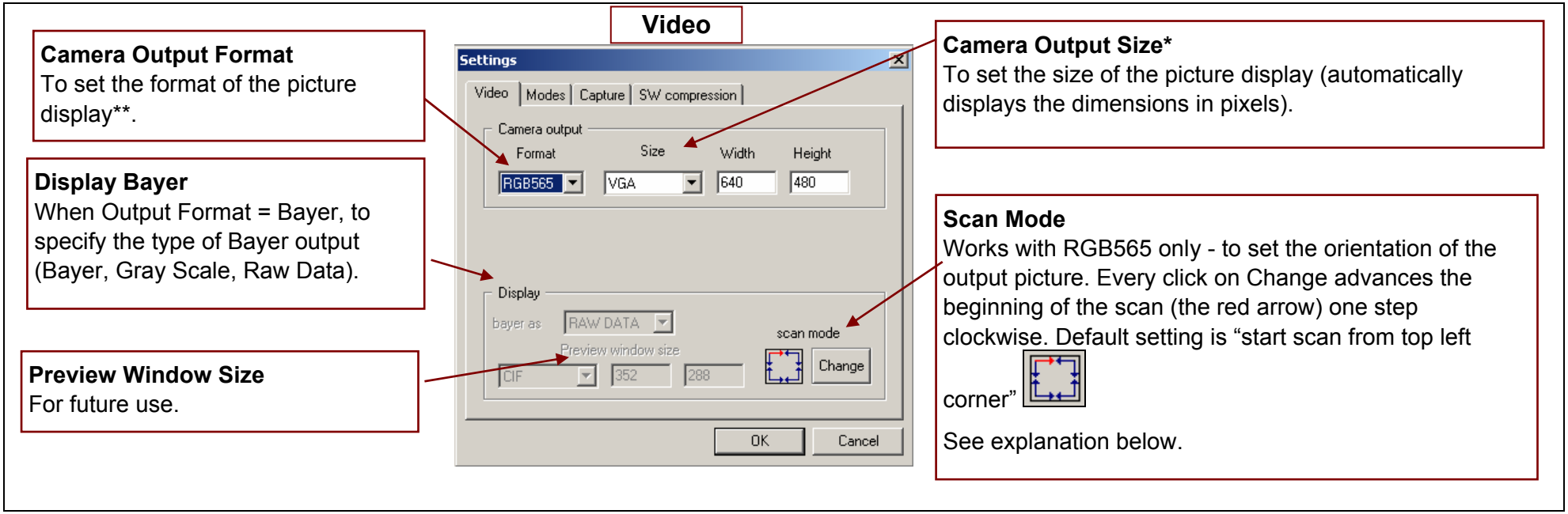
5.3 Configuration of the Picture Display

This section describes how to configure the display window.

5.3.1 Settings Dialog Box (TC5700 Family)

- Select **Options > Settings** to display the Settings window.
- Selecting Options > Settings without a Live Video window open displays the Settings dialog box, as below. If a live video display is not open, a different Settings dialog box appears.

If the Output Format is defined larger than the capacity of the TC camera sensor, a blank (green or black) screen appears when you open the display screen. For example, if you define SXGA for a VGA camera sensor (such as the TC5740 and TC5747) an image will not display.

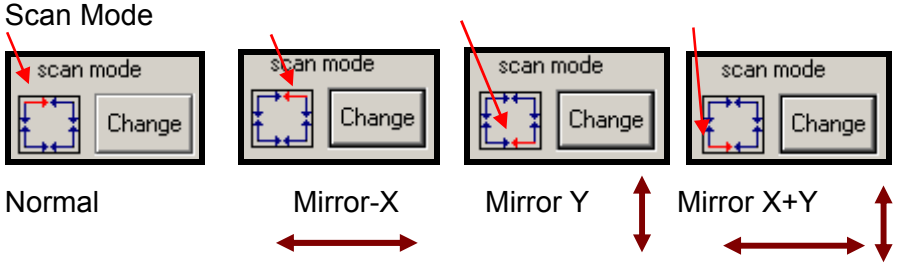


- * With the TC5700 family camera sensors, if you wish to change the image output size to non-standard sizes, do so by incrementing/decrementing the Width by units of 16 pixels, and the Height by units of 2 pixels. For example, .if you have the size as 352x288 (CIF) you can set the size to display 368x286.
- ** The format of a TC5700 picture can also be defined as Motion JPEG (MJPEG). For details see Motion JPEG (TC5700) on page 44

Scan Mode

The red arrow indicates the start point of the video scan, as described in the figures to the right.

Scan Mode



Load Defaults on Startup
Not used in this version

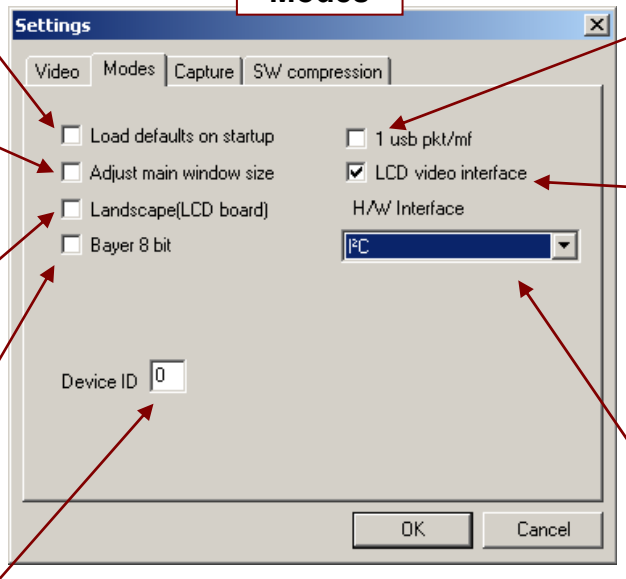
Adjust Main Window Size
Adjusts the size of the main window to fit the video preview window size.

Landscape (LCD Board)
Displays a landscape image when using an LCD board.

Bayer 8 bit
Enables 8 bit mode, rather than the default 10 bit mode.

Device ID
Set to 0 (zero), unless you need to open several CoderCam applications with a different ID number for each.

Modes



1 usb pkt/mf
Activate when using internal on-board USB2 host controller and set the Output Format to QVGA (Default=Inactivate)

LCD Interface
Check when using an LCD interface. Activated by default.

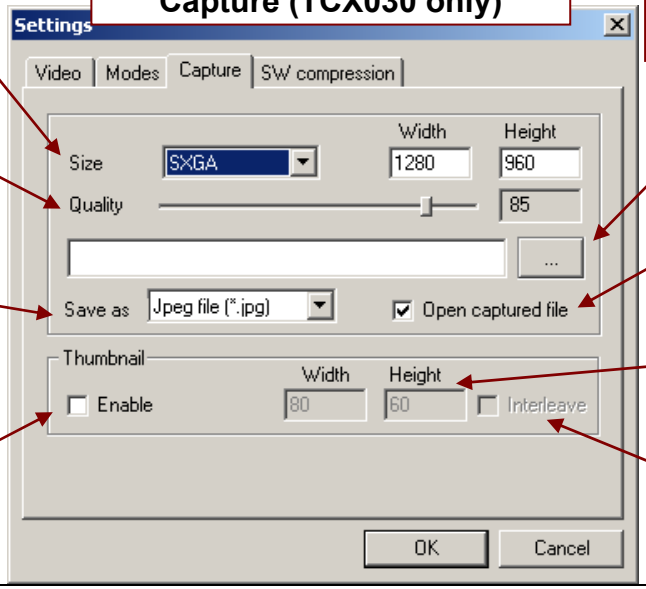
Hardware Interface

I²C
Select to use the I²C interface.

Parallel Interface 8 or 16 bit
Activate when using a Parallel interface (activate box and re-connect parallel interface). Default is Inactive.

Parallel 6 using I²C
Check when using 16-bit parallel I²C interface. Default is inactive.

Capture (TCX030 only)



Size
To set the size of the captured picture.

Quality
To select the quality of the JPEG.

Save As
To set the format of the capture image to be saved.

Thumbnail Enable
Enables capturing thumbnails (not used in this version).

To capture the image, click the Capture icon or the space bar.

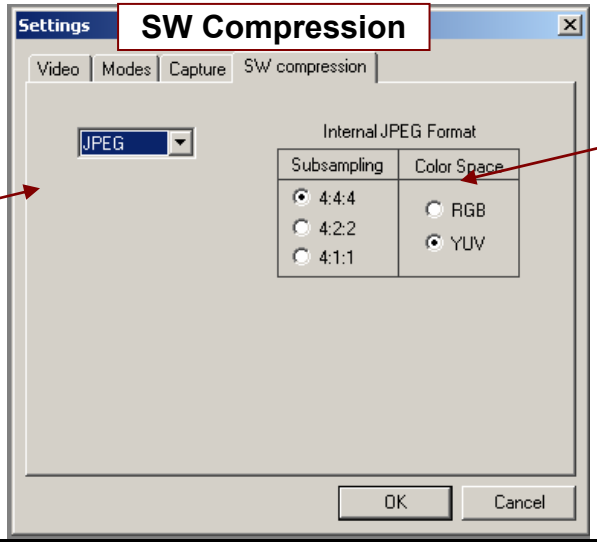
...
To select the directory in which to save the file.

Open Captured File
Displays the screen capture.

Thumbnail Width/Height
Sets the size of captured thumbnail images.

Interleave
Enables interleaving for captured thumbnail images.

SW Compression



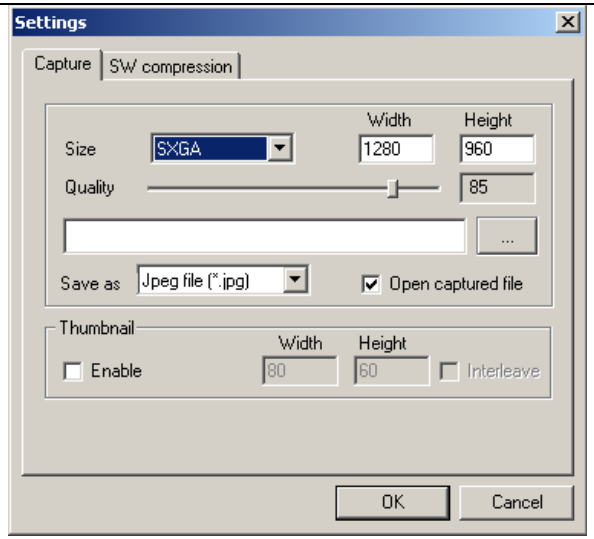
SW Compression
To specify the compression to apply to the image received from the camera TC camera sensor (JPEG, MPEG, D-JPEG). If JPEG, set size = VGA or CIF, MPEG, D-JPEG available (depending on software version).

Internal JPEG Format
To define the quality and compression ratio of captured JPEG files, see explanation below.

5.3.2 Options > Settings Dialog Box (with Live Video Display open)

When a Live Video Display is open, the Options > Settings dialog box has limited options. The reason for this is that after a live video has been displayed according to defined settings, these settings should not be changed (only after closing the live video display).

The options are similar to those in the Settings dialog box (above) when a live video picture is not open.



5.3.3 Defining the Display Parameters

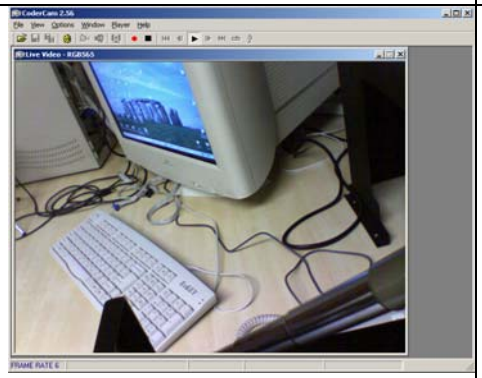
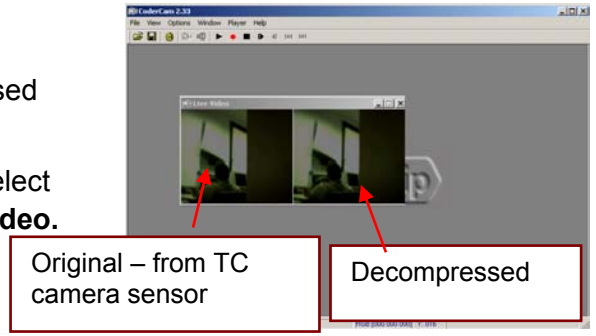
Output Format	Output Size
• YUV • RGB565 • RGB24 (TC574x only) • Motion JPEG (TC574x only) • Bayer	• UXGA - 1600X1200 (TC7030) • SXGA - 1280X960 pixels (TC7030/TC6030) • SVGA - 800X600 pixels (TC7030/TC6030) • VGA - 640X480 pixels • CIF - 352X288 pixels • QVGA - 320 x240 pixels • QCIF - 176x144 pixels • QQVGA - 160 x120 pixels • QQQVGA- 80 x 60 pixels

Bayer Representation	Compression
☝ Active only when you specify **Bayer** as the **Output Format** • Bayer (in Bayer Grid format) • Gray Scale (Y or G channel – color removed) • As Is (Raw data from TC camera sensor)	Compression to apply to original image: • JPEG (when selecting JPEG, select VGA or CIF as size. • MPEG • D-JPEG ☝ MPEG4, D-JPEG and MJPEG are software version dependent (may not be available in all versions).

Internal JPEG Format	Display Scan Mode (active only with RGB565 output format)
Subsampling (specifying the degree of JPEG compression) • 4:4:4 (higher quality, lower compression) • 4:2:2 (medium quality, medium compression) • 4:1:1 (low quality, higher compression Color space • RGB (not relevant) • YUV (not relevant)	 **Normal**  **Vertical** Requires: Width & Height  **Mirror X** Flips the image left to right

5.4 Viewing Live Video - Procedure

You can view either **uncompressed** or **compressed** video.

Uncompressed	Compressed
To view the picture as it is captured directly by the TC camera sensor. • From the top menu-bar select **View ⇨Live Video.** or From the toolbar, click the icon, or press Ctrl V. • A Live Video window appears displaying the picture as seen by the TC camera sensor. 	To compare the original uncompressed video with the compressed-then-decompressed version. • From the top menu-bar select **View ⇨ Compressed Live Video.** or From the toolbar, click . A Live Video window appears, displaying two panes. The left side is the original uncompressed video; the right side video has been compressed then decompressed. 

Notes

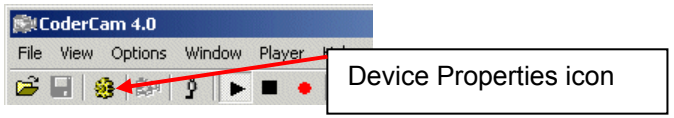
- For both Uncompressed and Compressed Video, the status bar at the bottom shows the Frame Rate, Compression Ratio and RGB value.
- To set the compression ratio, see Compression above.

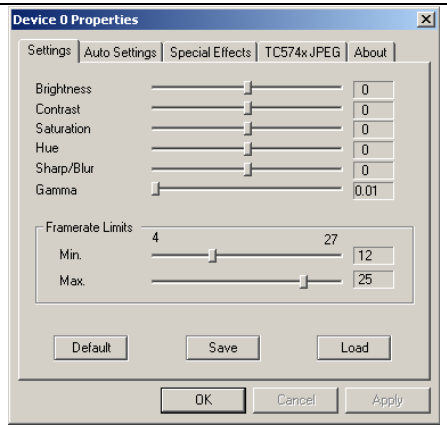
- To move the Live Video window – left click on the window (the hand icon appears) and drag the window to its new position.
- After changing the settings, such as output format, output size or device properties (brightness, hue, etc.), they remain in effect even after closing and re-opening the CoderCam application. To return Device Properties to its default settings, click the Default button in the Device Properties Control window (in the Options menu).

5.5 Device Properties

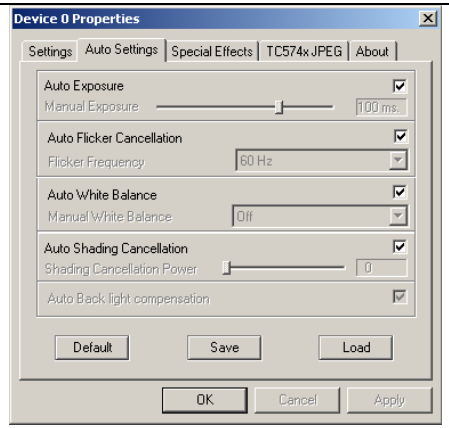
- Display the Video Settings window (below) by:
  - Selecting Options → Device Properties, or by clicking the Device Properties icon on the top menu bar.

The screens are explained below:

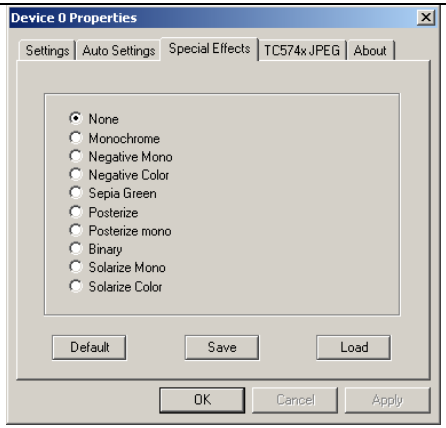




Settings

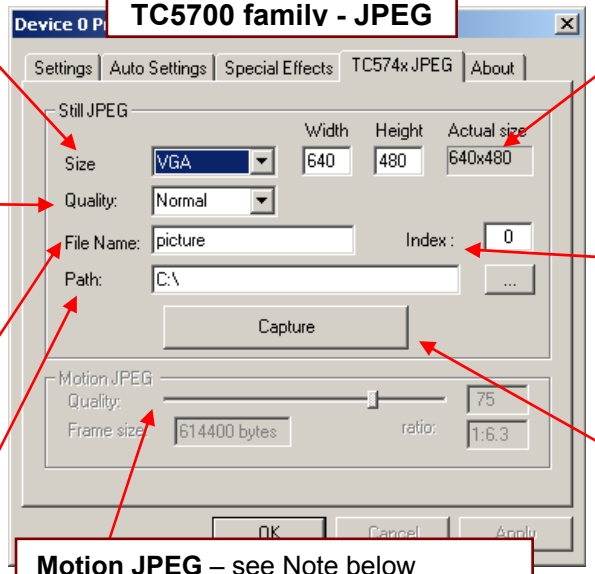


Auto Settings



Special Effects

TC5700 family - JPEG



Size - captured picture will be saved in this size.

Quality – the degree of JPEG compression (1=highest compression and smallest file size). Click and drag to change.

File Name - name under which to store the captured image.

Path – directory path to which captured image are saved.

Actual Size – size of the captured image actually displayed according to standard sizes (even when you change Width and Height). For example, if you specify 645x490, the image will be displayed at 640x480, the closest standard size to your setting.

Index – the number to start incrementing the file name of the sensor JPEG capture.

Capture – captures and saves the still JPEG image as received directly from the camera sensor. Click the Capture button (it is not necessary to click OK). The JPEG file (from the sensor) will be saved under the “Dir. Name” and the File Name you specified (see note below)

Motion JPEG – see Note below

5.5.1 Image Saving

When saved, the route the image takes depends on the option you choose to save the image. It also depends on the type of camera sensor. The options that allow saving are:

- **Capture** square button in the Device Properties window (see screen above)
- **File > Save** or the **Save** icon  (after clicking the **Stop** icon ).
- **Capture** icon  on the top toolbar

With the TC5700 family, the first option (Capture square button) takes the image directly from the sensor and saves it. The second option (**File > Save**) captures the image from the camera sensor streamed out via the parallel video interface (PVI). The third, JPEG **Capture** icon  , performs handset capture simulation, by compressing the image and then decompressing it for display.

With the TC6030, all options capture the image from the camera sensor streamed out via the parallel video interface (PVI).

Notes

- When you click the **Capture** button (in the Device Properties window), the image is received directly from the camera sensor and is stored in the directory under the file name you specified in the two fields: “Dir Name” and “File Name”. The number “00x” will be appended to the file name, where “x” is the number in the “**File Index**” field. If, for example, in the above window you specified “2” in the File Index field, the file name will become “**testvga1**002”. After that, at every Capture, the File Index number is automatically incremented by 1 (the next file name, for example, will be **testvga1**003).
- If you wish to restore the original values in the dialog box, click the **Default** button.
- Motion JPEG (MJPEG) images can be displayed in different compression ratios, see **Motion JPEG (TC5700)**.

5.5.2 Settings Dialog Box

Option	Description	Setting / Range*
Settings		
Brightness	Sets target brightness of auto exposure. Default value is 0.	-3 to +3
Contrast	Apparent difference in brightness between light and dark areas of an image.	-128 to +128
Saturation	Saturated colors are vivid, strong, or deep, as opposed to desaturated colors which are dull, weak, or washed out.	-128 to +128
Hue	That attribute of a color by which we distinguish red from green, blue from yellow, and so on.	-128 to +128
Sharp/Blur	Sharpness is the high definition of edges in an image. Blur is the fuzzy, unfocused appearance.	-128 to +128
Gamma	Adjustments to digital image data transmitted to the display monitor to compensate for the monitor's luminance display capability.	0.1 to 1.0 in steps of 0.01
Framerate Limits	Determines the frame rate range. The values above the slider on the left and right represent the minimum and maximum frame rates set by the module's firmware. Min – the minimum frame rate to be applied. Move the slider to select a value. The selected value is displayed in the text box on the right. Max – the maximum frame rate to be applied (depending on the frequency of the fluorescent lighting). Move the slider to select a value. The selected value is displayed in the text box on the right. For a fixed frame rate, set the minimum and maximum rates to the same value.	Depends on the module. See the module datasheet for more information.
Default	To re-apply the default values set in the factory for the control parameters.	
Save	To save the current settings in a file for future use.	
Load	To load previously saved settings.	

* Default settings may change from software release to another.

5.5.3 Auto Settings Dialog Box

Auto Settings		
Auto Exposure	Enables auto exposure.	Active/Inactive
Manual Exposure	Duration of exposure. Clear the Auto Exposure check box to enable, then click and drag the slider to enter the duration of exposure in milliseconds.	Slider
Auto Flicker Cancellation	Check the box to automatically set the flicker cancellation frequency.	Active/Inactive
Flicker Frequency	Sets the flicker frequency. Clear the Auto Flicker check box to enable, then select the flicker frequency value from the drop-down list.	Drop-down list
Auto White Balance	Enables adjusting individual colors to eliminate unwanted color bias.	Auto/Manual
Manual White Balance	Manually adjust white balance. Not supported in this version	Drop-down list
Auto Shading Cancellation	Check the box to compensate for “fall-off” (shading) at picture corners (vignetting).	Active/Inactive
Shading Cancellation Power	Select the level of shading compensation, from 0 to 100. Active for Auto mode only.	Slider
Auto Backlight Compensation	Backlighting – to activate adjustment for backlighting (camera parameters are optimized for image center) . Not supported in this version.	Active/Inactive

5.5.4 Special Effects Dialog Box

Special Effects		
None	Displays a normal picture.	Active/Inactive
Monochrome	Displays images in shades of black and white.	Active/Inactive
Negative Mono/Color	Replaces each pixel color with its opposite on the color wheel. The new image is like a photographic negative.	Active/Inactive
Sepia 1/2/3/Green	Applies a warm color tone to the image: Sepia 1: Applies a yellowish green tone. Sepia 2: Applies a brown tone. Sepia 3: Applies a blue tone. Sepia Green: Applies a green tone.	Active/Inactive
Posterize (color, mono)	Reduces the number of bits per color channel, decreasing the number of colors and levels of lightness in the image and resulting in a flatter-looking image (TC6030 only).	Active/Inactive
Binary	Displays the image in black and white only.	Active/Inactive
Solarize (color, mono)	Simulates the distortion, in color or in shades of gray, resulting from over-exposure.	Active/Inactive

6. Operating Live Motion Video

To record and play a live motion video of a scene you capture with the TC-EVM unit.

Below is a description of how to record and play a short scene. Further on is a list of icons that are used in the Live Video session.

6.1 Procedure

- Click the Live Video icon  to display the Live Video window (assuming that your TC-EVM is connected and operating).

If you wish, adjust the size of the display image and other controls (brightness, contrast, etc.). Otherwise, you can proceed immediately to record.

- Click the Record  icon to start recording. The camera will record the scene as shown in the display window. Move the camera or objects in the scene.
- Click the Stop Recording  icon. The camera terminates the recording session.
- Select **File > Save** or click the Save  icon to save the video. Select a location and save as one of the following:
  1. *.tcs (TransChip) format to view the video with the TC-EVM application
  2. *.avi format to view the video in any video application, such as RealPlayer or Windows Media Player.

☝ The other formats in which you can save do not display motion video **(*.yuv**=raw data, ***.bmp**=bitmapped image**,*.jpg**=JPEG format). Note that yuv is raw data and cannot be viewed without an appropriate application. *.bmp or *.jpg files are still images captured from the video and do not store/display motion.

☝ To continue display motion video, click Play  again.

6.2 The Live Motion Video Icon Bar

	**Play–**plays a selected video.
	**Record–** starts to record a video.
	**Stop–** stops recording and play.
	**Next Frame–** moves the video forward one frame (available after stopping the video).
	**Previous Frame–** moves the video back one frame (available after stopping the video).
	**First Frame–** rewinds the video to the beginning (available when viewing a saved video).
	**Last Frame–** advances the video to the end (available when viewing a saved video).
	**Player Loop–**continuous video play - returns automatically to the first frame when the last frame is reached (available when viewing a saved video).
	**JPEG and DJPEG operations** – performs handset capture simulation. With the TC5700 family, this option performs handset capture simulation, by compressing the image and then decompressing it for display. After performing the capture, the image display stops. Close the image display and re-open. With the TCX030, this option (and all save options) captures the image from the camera sensor streamed out via the parallel video interface (PVI). With TCX030 it is possible to save in .bmp format as well as JPEG. The pre-defined capture settings apply to the captured image.

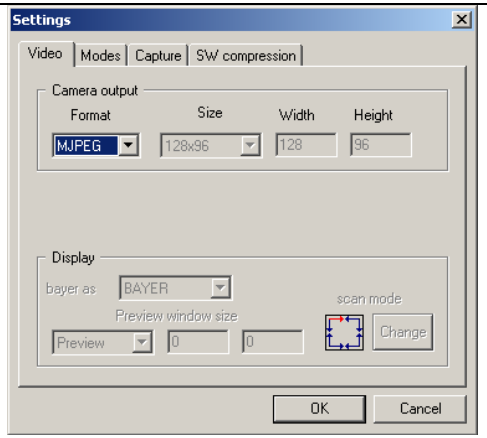
7. Motion JPEG (TC5700)

To display a series of JPEG images in motion.

➢ Define the format as MJPEG

- Open the Options > Settings > Video dialog box and select MJPEG as the display format.
- Click the Live Video Preview icon to display the image (or press Ctrl V).

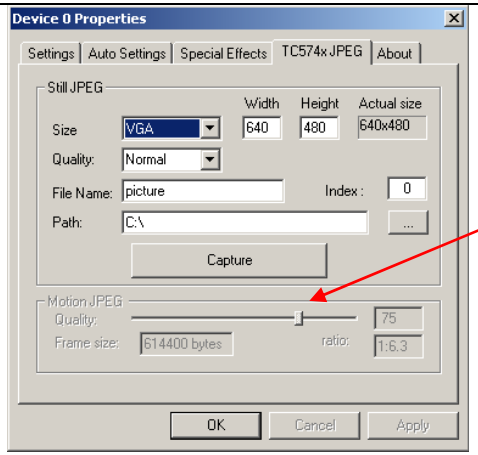
An image appears in the display window.



➢ Adjust the quality and compression ratio by dragging the Quality slider.

- Open the Options > Device Properties dialog box and select the TC574x JPEG tab.
- Drag the slider to the left to decrease quality and increase the compression ratio and vice versa.

The frame size in bytes appears in the Frame Size field. The compression ratio appears in the Ratio field

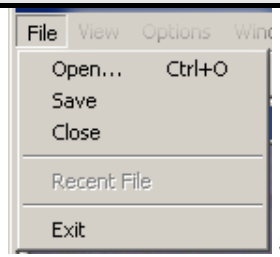


To adjust Compression vs Quality, drag the slider.

Drag left to decrease quality and increase the compression ratio and vice versa.

8. CoderCam Window – Options Icons and Shortcuts

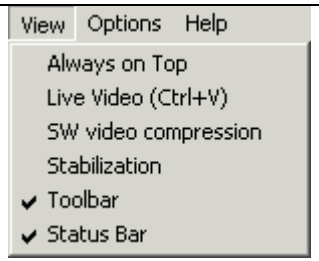
File



When the Live Preview window is not open, the option File > Convert appears. This is for advanced users to convert YUV CIF and YUV QCIF to TCS (.tcs extension).

Standard Windows commands.

View



Standard Windows commands. See 8.1 Top Menu Bar for details.

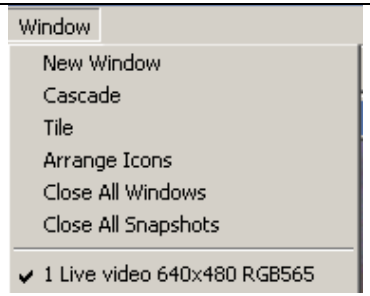
Options

Settings (**Options > Settings Dialog Box (with Live Video Display open)** page **34**)

Device Properties (**Device Properties** on page **36**)

Adjust Window Size (Ctrl A) – press Ctrl A set the window size as the image size.

Windows



Ctrl T closes all toolbars and windows except for the Live Preview window. Clicking Ctrl T again re-opens all windows and toolbars.

Standard Windows commands

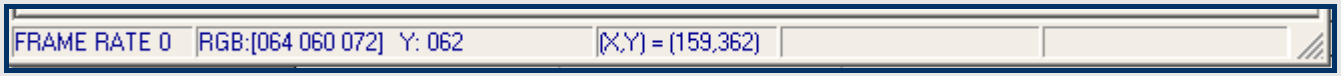
Player	 Enables control of video output. See **The Live Motion Video Icon Bar** for details.

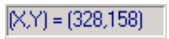
8.1 Top Menu Bar

	**File > Open** – opens **.tcs** or **.jpg** files.
	**File > Save**– saves still images (***.bmp, *.jpg**), or motion video files (***.tcs, *.avi**), after clicking the **Stop** icon. The JPEG file is saved after transmission to the computer (and not directly from the TC-camera sensor).
	**Options > Device Properties (Ctrl F)**–to specify brightness, contrast, etc. Also, to define digital effects, and to execute a capture.
	**View > Live Video**– displays the original image as transmitted by the camera.
	**View > SW Compression** – opens two windows, the left displaying the original image from the camera, and the right displaying the image compressed by the software, according to parameters defined in the Options > Settings dialog box **(Settings Dialog Box (TC5700 Family).**
	**Stabilization**– opens two windows, one displaying the original image from the camera, and the other displaying an image stabilized by the software.
	**Reconnect EVB/Firmware Upload-** performs two functions. 1. While Live Video Preview is On, this button uploads the firmware. 2. While Live Video Preview is Off it reconnects the EVB (to reset the system).
	**Play–** plays a selected video.

	**Record–** starts to record a video.
	**Stop–** stops recording and play.
	**Next Frame–** moves the recorded video forward one frame.
	**Previous Frame–** moves the recorded video back one frame.
	**First Frame–** rewinds a recorded video to the beginning
	**Last Frame–**advances the recorded video to the end.
	**Player Loop–** continuous recorded video play - returns automatically to the first frame when the last frame is reached (available when viewing a saved video).
	**JPEG and DJPEG operations** – performs handset capture simulation. With the TC5700 family, this option performs handset capture simulation, by compressing the image and then decompressing it for display. After performing the capture, the image display stops. Close the image display and re-open. With the TCX030, this option (and all save options) captures the image from the camera sensor streamed out via the parallel video interface (PVI). With TCX030 it is possible to save in .bmp format as well as JPEG. The pre-defined capture settings apply to the captured image.

8.2 Bottom Status Bar



	**Frame Rate**– real frame rate as derived from the camera.
	**Frame**– current frame and the total number of frames (available when playing an existing file).
	**Progress Bar**– progress of operations, such as when saving and opening files.
	**Color Components–** color mix (RGB) at the mouse cursor position on the image.
	**Coordinates–** displays the coordinates at the mouse location on the image.

8.3 Keyboard Shortcuts

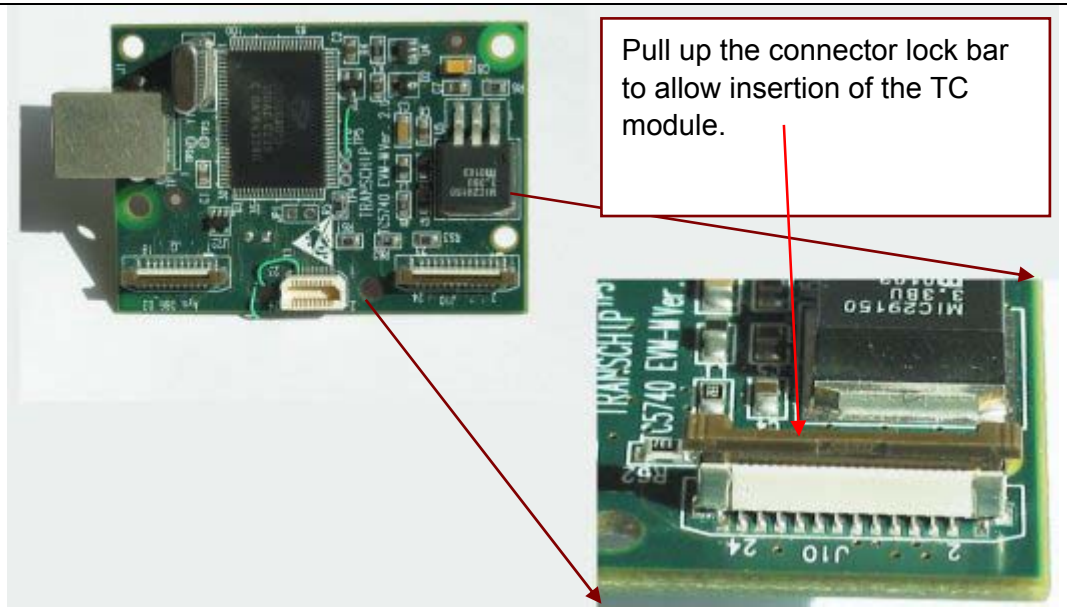
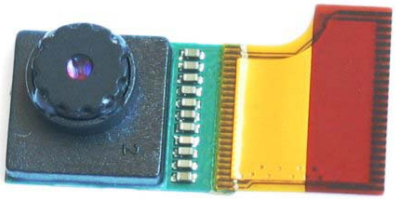
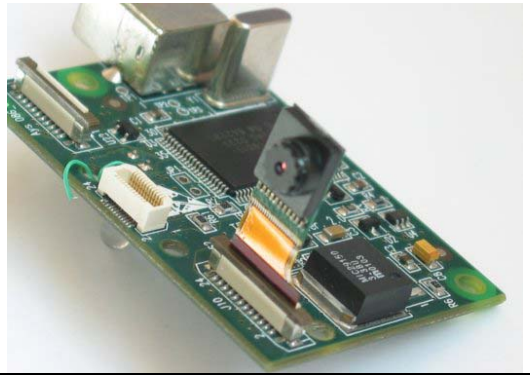
Ctrl A	Adjusts window to image size	Ctrl T	Closes all toolbars, options and windows except for the Live Preview Video window. Click Ctrl T again to restore.
Ctrl P	Opens the Device Properties dialog box	Ctrl O	To open a saved image or video.

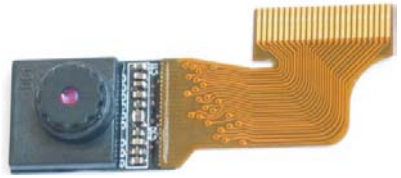
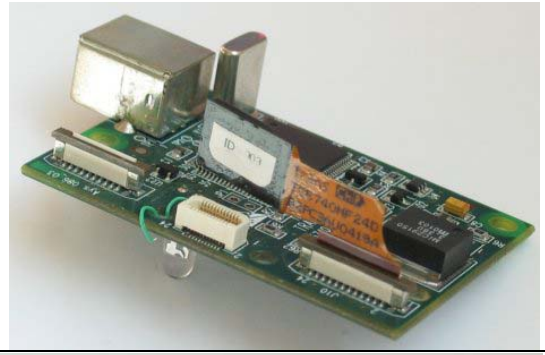
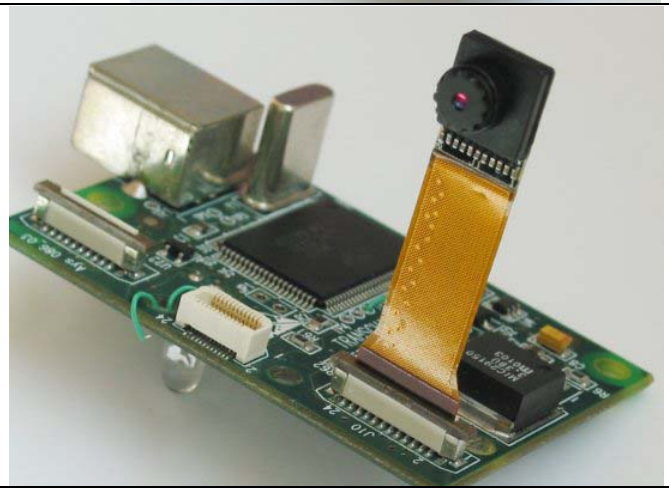
9. Appendix – Troubleshooting

Problem – First-time Launch of CoderCam	
After launching CoderCam for the first time, if the message **Device Ready** (on the status bar at the bottom of the screen) appears within 3 seconds, there is a problem	To find the cause, : 1. Disconnect the TC camera sensor (and adaptor, if available) from the TC-EVM board and reconnect. If this does not work proceed to the next stage. 2. Connect only the TC-EVM board (removing TC camera sensor and adapter). A message should appear in the status bar: “Connecting” then “Device Ready” within 3 seconds. Select Start > Settings > Control Panel and click on Hardware >Device Manager. Check if Imaging Devices displays an error message (indicating a problem with the TC-EVM board). Replace the TC-EVM board. 3. If the TC-EVM board is OK, replace the TC camera sensor and its adaptor (if available) with a new set. 4. If all fails, call TransChip Support.
Intermittent problems.	Check to make sure you are using the USB2 card included in the TransChip EVM Kit (either for your desktop or laptop computer).
Problem –CoderCam behaves erratically	
While performing different functions, you may find that the display window is either black or green, and you cannot see a picture, or some other dysfunction that you cannot solve.	It is possible that the firmware has been disrupted and needs reloading. • Click the “Init TC camera sensor” icon  . After a few seconds the firmware will be re-loaded. Click the Live Video button to view a normal picture.

10. TC5740-MF24 Connection Options

This section describes various options on how to connect TransChip modules to the Evaluation Board. Before making the connections, assemble the EVM board according to the instruction in **Attaching the Support Board (for the EVM_TC5700 Family)**.

On the EVM board, pull up the connector lock bar, as shown to the right.	
Insert **TC5740MF24G** as shown to the right. After inserting all the way into the connector, push down the connector lock bar.	 

Insert **TC5740MF24D** as shown to the right. After inserting all the way into the connector, push down the connector lock bar.	 
Insert **TC5747MF24F** as shown to the right. After inserting all the way into the connector, push down the connector lock bar.	 
Attach the tripod, as shown to the right.