

# APPLICATION NOTE

AN-L01

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## LYNX CAMERA SERIES

### FIRMWARE AND SOFTWARE UPGRADE

**Abstract:** This application note describes use of the LynxTerminal utility to upgrade the Lynx series of CameraLink and GigE cameras.

**Imperx, Inc**  
**Tel:** (+1) 561-989-0006  
**Fax:** (+1) 561-989-0045  
**Email:** [techsupport@imperx.com](mailto:techsupport@imperx.com)  
**Web:** [www.imperx.com](http://www.imperx.com)

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## 1. INTRODUCTION

Camera download and terminal utility software, the Lynx Terminal, is provided with each camera. After installing the program, the user has access to a ‘terminal’ console and a ‘download’ utility. The terminal console provides a command line interface allowing the user to send commands and receive responses from the camera. Whereas the Lynx Configurator utility provides a graphical user interface to the camera, the Lynx Terminal utility provides a command line interface. The download utility allows the user to download newly released software, firmware or other files into the camera’s non-volatile memory.

## 2. LYNX TERMINAL SETUP

When the Lynx Terminal is launched, the following screen shown in Figure 1 will appear

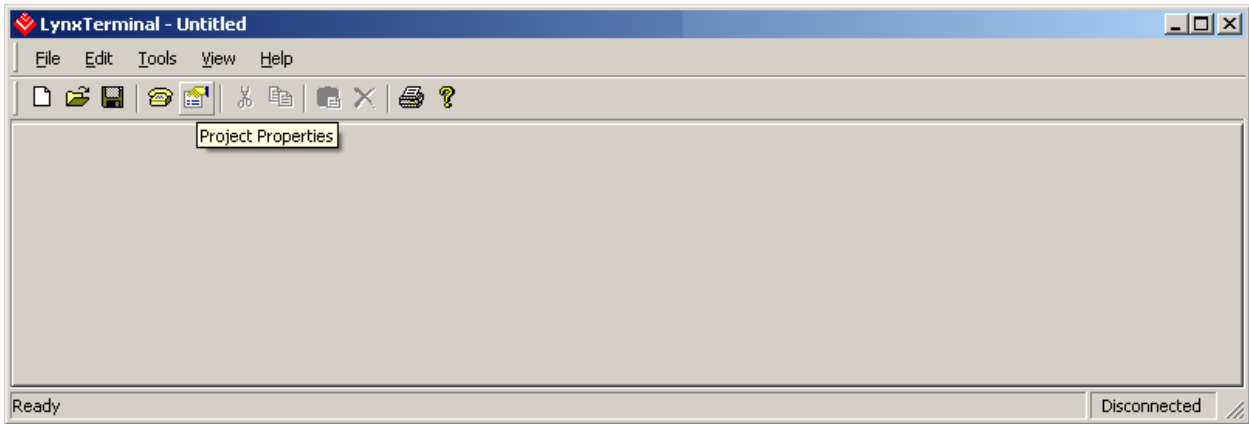


Figure 1. Lynx Terminal main dialog

The user must first configure the operating parameters of the Lynx Terminal program. From the ‘File’ menu select ‘Properties’ (or click on the fifth icon) and the following ‘Project Properties’ dialog will appear – Figure 2. In the first tab “Plug-ins” select all of the plug-ins by checking the boxes listed.

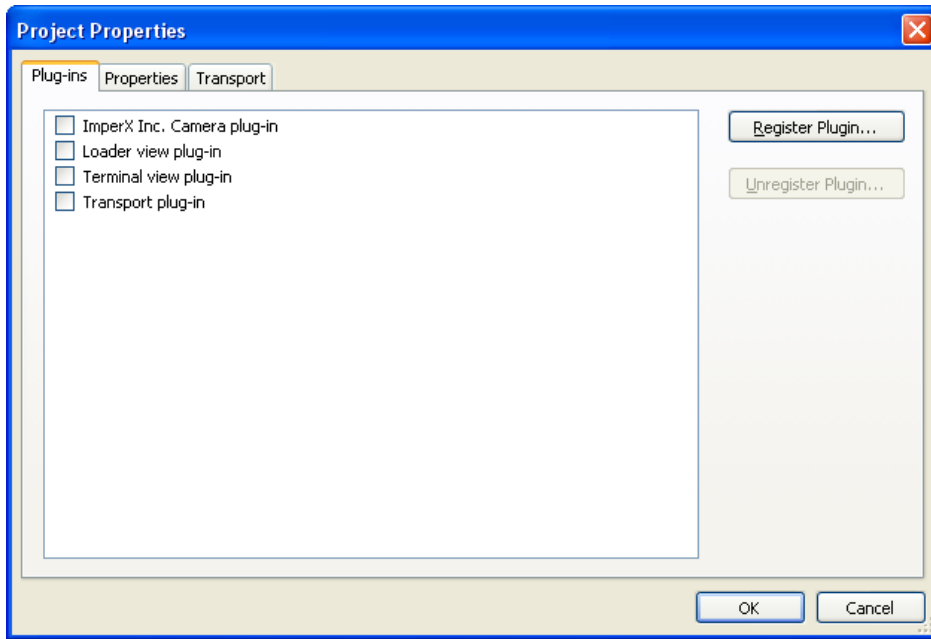


Figure 2. Plug-in Properties dialog

Next click on the 'Properties' tab and the screen shown in Figure 3 will appear. You may select either the 'Camera Link', 'GigE' or 'Serial Transport' options. Select the 'Camera Link' option if the computer is connected to the camera using a Camera Link compliant serial interface. The program will display a list of Camera Link compliant serial interfaces (clser\*\*\*.dll files) that it has found. If several frame grabbers are connected to your computer, choose the desired one.

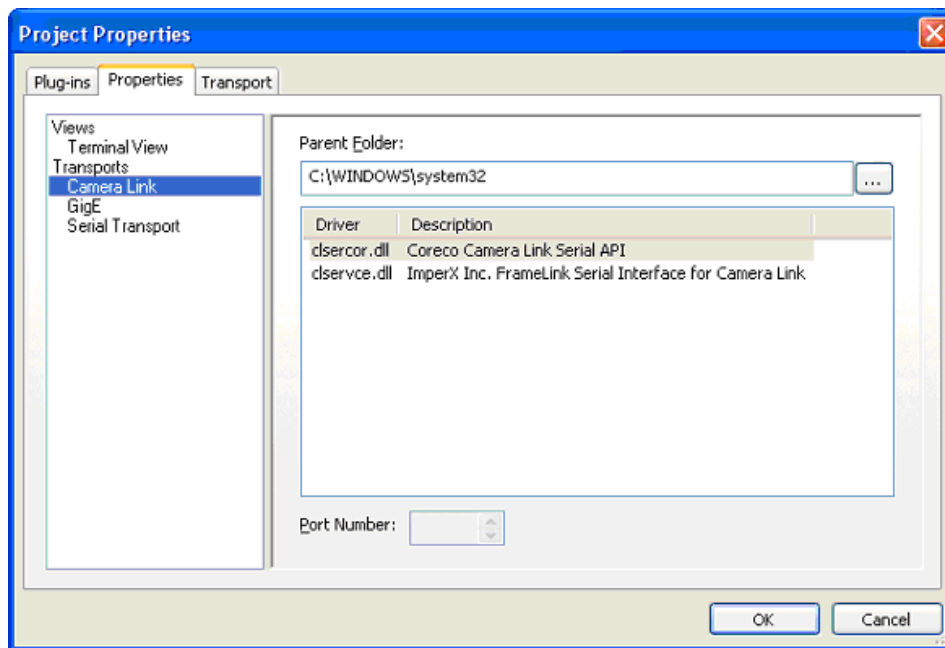


Figure 3. Camera Link Transport Properties dialog

Select the 'GigE' option if the computer is connected to the camera using a GigE interface. The program will display the Imperx serial interface for Lynx GigE ( clserilg.dll file ) that it has found – Figure 4.

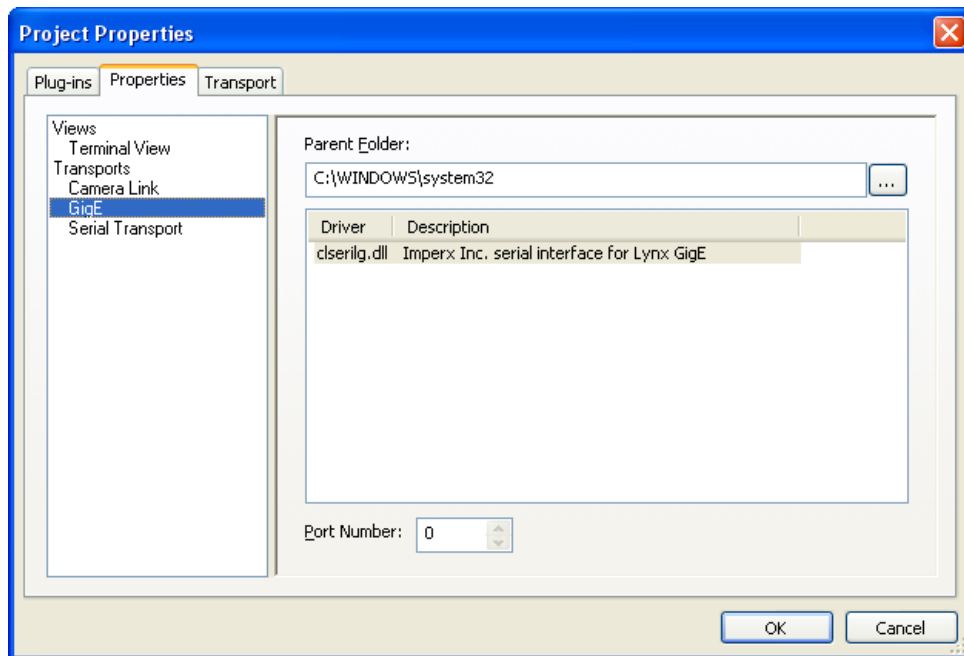


Figure 4. GigE Transport Properties dialog

Select the 'Serial Transport' option if the camera is connected to the computer using a serial COM port. You must choose the COM port in the Serial pull-down menu and configure its operating parameters (i.e. 'Bits per', 'Data Bits', etc.). LYNX supports 9600 bps, 8 bits, no parity, 1 stop bit, no flow control – Figure 5.

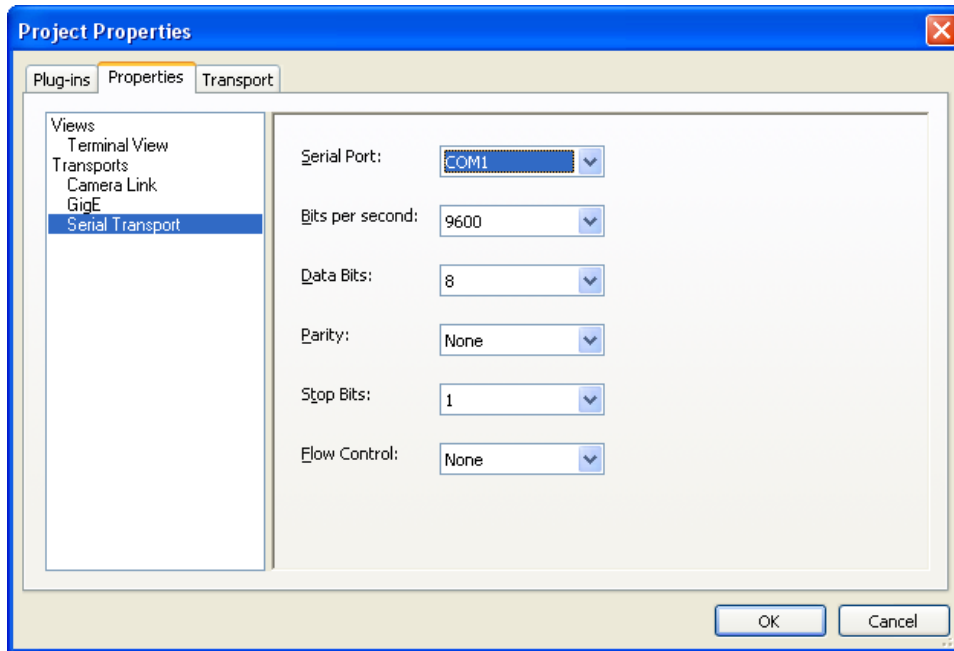


Figure 5. Serial Transport Properties dialog

Next click on the 'Transport' tab and the screen shown in Figure 6 will appear. Select the desired interface, Camera Link, GigE or Serial Transport ( i.e. the one selected in "Properties" tab ), and click 'OK'.

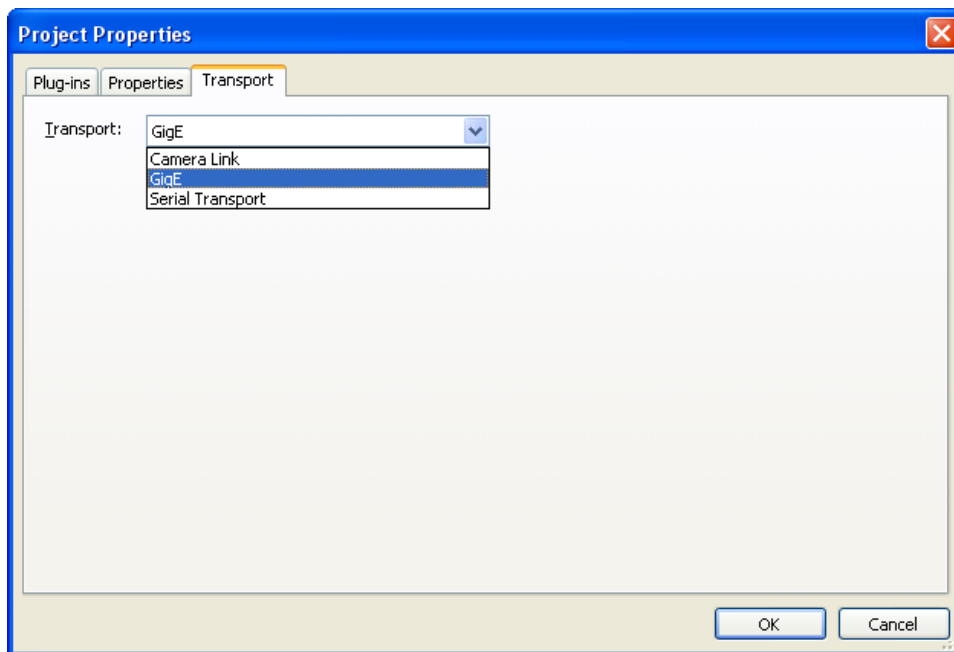


Figure 6. Transport dialog

You are now ready to begin communicating with the camera. To verify this, in the main terminal window select the “Terminal View” tab. The Terminal View is a text console, which can be used to communicate with the camera. Camera commands entered into this console will be sent to the camera using the transport method chosen during the Lynx Terminal setup. Camera responses sent by the camera will be displayed in this console as well. If the user types “h” (help) in the window, the camera will respond by listing all the commands supported – Figure 7.

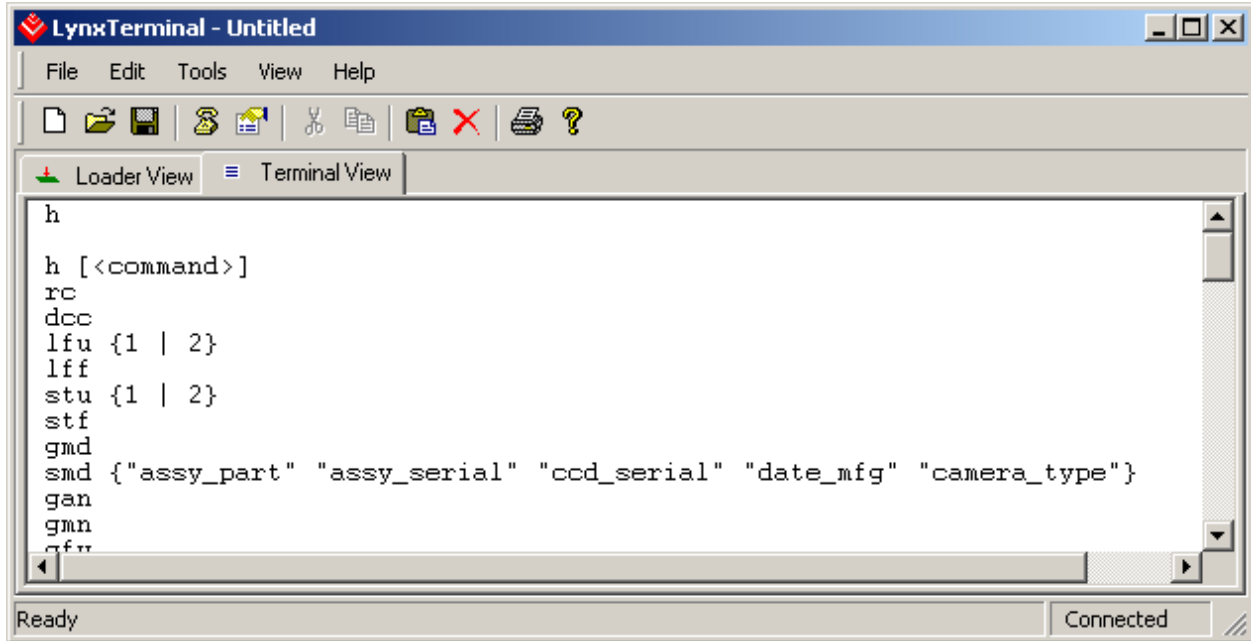


Figure 7. Terminal View dialog

### 3. CAMERA UPGRADE

From the main terminal window select the 'Loader View' tab and the Loader View screen will appear – Figure 8. The user can select to download either new Camera Software, Camera BootLoader, Camera Firmware, a Lookup Table, a Defect Correction table or a Flat Field Correction file by selecting the appropriate button. The path/filename of the file can be entered manually into the edit box or browsed to by clicking on the '...' button. Clicking on the 'Load File...' button begins the download process. The user must be familiar with the entire procedure and must follow it precisely.

**NOTE: IF THE USER SELECTS TO UPGRADE CAMERA FIRMWARE AND CAMERA SOFTWARE, THE CAMERA FIRMWARE MUST BE UPGRADED FIRST.**

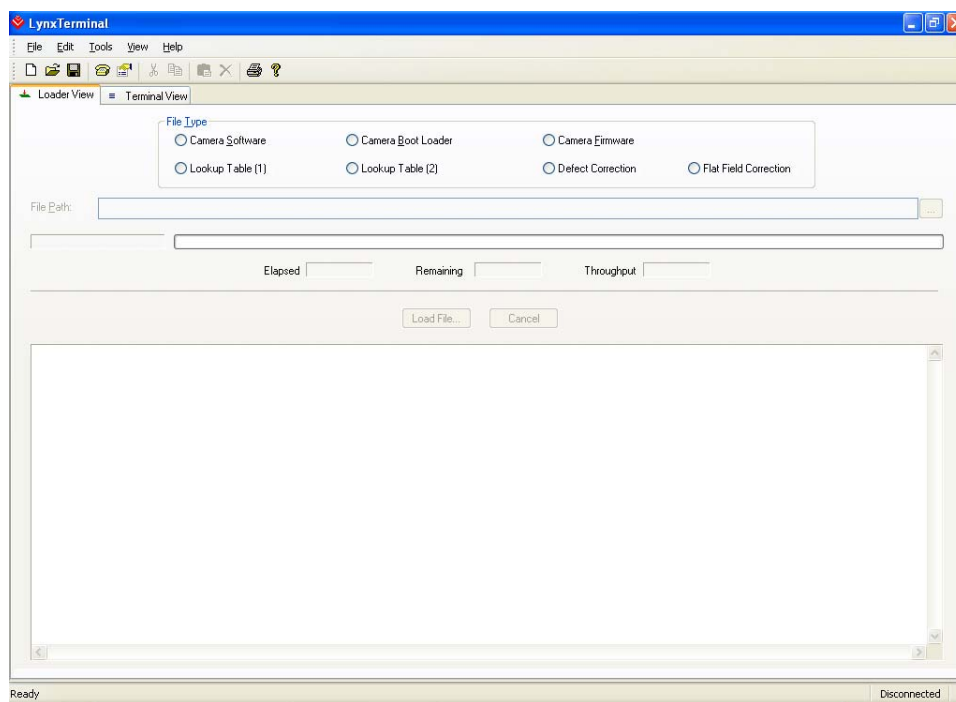


Figure 8. Loader View dialog

***CAUTION NOTE:***

***!!! DURING CAMERA UPGRADE THE CAMERA POWER MUST BE ON ALL THE TIME, AND THE PROCESS MUST NOT BE INTERRUPTED. IF THE CAMERA IS DISCONNECTED OR THE PROCESS CANCELED, THIS WILL RESULT IN FIRMWARE OR SOFTWARE CORRUPTION, AND THE CAMERA WILL NO LONGER FUNCTION PROPERLY. IN SUCH EVENT – CONTACT IMPERX IMMEDIATELY !!!***

***IF THE CAMERA UPGRADE FAILS:***

***DO NOT EXIT THE LynxTerminal Loader View OR POWER CYCLE THE CAMERA, INSTEAD IMMEDIATELY REPEAT THE UPGRADE BY CLICKING ON THE 'LOAD FILE...' BUTTON AGAIN.***

### 3.1 FIRMWARE UPGRADE

To upgrade the camera firmware, select “Camera Firmware” and then select the file to be up-loaded. The camera firmware controls all camera features, CCD timing, analog front ends, and all I/O interfaces. The path/filename of the file can be entered manually into the edit box or browsed to by clicking on the ‘...’ button. The file has a .zip extension. Clicking on the ‘Load File...’ button begins the download process. The window will display the time required ( Elapsed and Remaining ), and the status bar will show the progress. After the upload is completed, “DONE” will be displayed in the window text area.

After the upgrade has been completed the camera will reset itself and will be ready to use.

***IF THE CAMERA UPGRADE FAILS:*** Do not exit the LynxTerminal Loader View or power cycle the camera, instead immediately repeat the upgrade by clicking on the ‘Load File...’ button again.

### 3.2 SOFTWARE UPGRADE

To upgrade the camera software, select “Camera Software” and then select the file to be up-loaded. The camera software controls the operation of the 32-bit RISC processor. The path/filename of the file can be entered manually into the edit box or browsed to by clicking on the ‘...’ button. The file has a .srec extension. Clicking on the ‘Load File...’ button begins the download process.. The window will display the time required ( Elapsed and Remaining ), and the status bar will show the progress. After the upload is completed, “DONE” will be displayed in the window text area.

After the upgrade has been completed the camera will reset itself and will be ready to use.

***IF THE CAMERA UPGRADE FAILS:*** Do not exit the LynxTerminal Loader View or power cycle the camera, instead immediately repeat the upgrade by clicking on the ‘Load File...’ button again.

### 3.3 BOOT LOADER UPGRADE

To upgrade the camera boot loader, select “Camera Boot Loader” and then select the file to be up-loaded. The boot loader controls the camera upgrade functions. The path/filename of the file can be entered manually into the edit box or browsed to by clicking on the ‘...’ button. The file has a .srec extension. Clicking on the ‘Load File...’ button begins the download process. The window will display the time required ( Elapsed and Remaining ), and the status bar will show the progress. After the upload is completed, “DONE” will be displayed in the window text area.

After the upgrade has been completed the camera will reset itself and will be ready to use.

***IF THE CAMERA UPGRADE FAILS:*** Do not exit the LynxTerminal Loader View or power cycle the camera, instead immediately repeat the upgrade by clicking on the ‘Load File...’ button again.

### **3.4 LOOKUP TABLE UPGRADE**

To upgrade a camera lookup table, select “Lookup Table (1)” or “Lookup Table (2)” and then select the file to be up-loaded. The path/filename of the file can be entered manually into the edit box or browsed to by clicking on the ‘...’ button. The file has a .lut extension. Clicking on the ‘Load File...’ button begins the download process. The window will display the time required ( Elapsed and Remaining ), and the status bar will show the progress. After the upload is completed, “DONE” will be displayed in the window text area.

After the upgrade has been completed the camera will reset itself and will be ready to use.

### **3.5 DEFECT CORRECTION UPGRADE**

To upgrade a camera Defect Correction map, select “Defect Correction” and then select the file to be up-loaded. The defect correction map is a file that contains the X/Y coordinates for each pixel in the imager that is defective. The path/filename of the file can be entered manually into the edit box or browsed to by clicking on the ‘...’ button. The file has a .dpm extension. Clicking on the ‘Load File...’ button begins the download process. The window will display the time required ( Elapsed and Remaining ), and the status bar will show the progress. After the upload is completed, “DONE” will be displayed in the window text area.

After the upgrade has been completed the camera will reset itself and will be ready to use.

### **3.6 FLAT FIELD CORRECTION UPGRADE**

To upgrade a camera Flat Field Correction file, select “Flat Field Correction” and then select the file to be up-loaded. The flat field correction file contains the coefficients required for the camera to compensate for any variations in the pixel responsivity of the sensor. The path/filename of the file can be entered manually into the edit box or browsed to by clicking on the ‘...’ button. The file has a .ffc extension. Clicking on the ‘Load File...’ button begins the download process. The window will display the time required ( Elapsed and Remaining ), and the status bar will show the progress. After the upload is completed, “DONE” will be displayed in the window text area.

After the upgrade has been completed the camera will reset itself and will be ready to use.

#### **Notes:**

- The Flat Field Correction algorithm is not implemented in an IPX-VGA120, IPX-VGA210 or IPX-1M48 camera.
- The Flat Field Correction file is stored in the same space in non-volatile memory as the Lookup Table (2). Therefore, the camera cannot support both LUT #2 and FFC at the same time.