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Application Note:
# Canon EF Adapter on Prosilica GE and Prosilica GX cameras

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## Introduction

This document is a guideline for using the Canon EF mount with Prosilica GE and Prosilica GX cameras.  The Canon EF adapter can be used with any Canon EF, Canon EFs, Tamron Di and Tamron Di II lenses.  These photography type lenses provide motorized iris and focus control.

## Ordering Information

The Canon EF mount is provided in two different ways:

1.  Factory Conversion – used when purchasing a camera with the Canon EF mount pre-installed
2.  Field Kit  – Used by customers who already have a camera and would like to adopt this to a Canon lens

| Short | Description | Part Number |
|---|---|---|
| Field Kit, Canon EF Adapter for Prosilica GE | Field Kit, Motorized Canon EF Mount for Prosilica GE, RS232 via Camera I/O | 02-5026B |
| Field Kit, Canon EF Adapter for Prosilica GX | Field Kit, Motorized Canon EF Mount for Prosilica GX, RS232 via Camera I/O | 02-5031A |
| Factory Mod, Prosilica GE with Canon EF Mount | Factory conversion of Prosilica GE to Canon EF Motorized Mount. RS232 via Camera I/O | *02-20XXX-09 |
| Factory Mod, Prosilica GX with Canon EF Mount | Factory conversion of Prosilica GX to Canon EF Motorized Mount. RS232 via Camera I/O | *02-24XXX-09 |

*Attach Modifier Order Code at the end of Camera Order Code, ie: 02-2404B-09 = GX1910 with EF mount

## Parts List

| Description | *Canon EF adapter | Power supply | DB9 to Hirose adapter |
|---|---|---|---|
| Sample Image |  |  |  |

* Installed on the camera when ordering Factory Mod using 02-20XXX-09 or 02-24XXX-09

# Installation

The installations below apply to customers who purchased the field kit for the Canon EF mount (02-5031A for GE and 02-5026B for GX).  Customers who purchased a Prosilica GX or Prosilica GE camera with the EF mount installed in the factory can proceed to the next section in this document.

| Step | Notes | Image |
|------|-------|-------|
| 1. | Ready all components and prepare GE or GX camera for installation |  |
| 2. | Remove the existing F-mount front end from the camera by loosening the 3 hex set screws on the outside of the F mount adapter. |  |
| 3. | Install the Canon EF adapter onto a GE4000 camera, adjust the back focus distance and tighten the 3 hex set screws.<br><br>The following instructions explain this process for a C mount camera, however the user can easily apply this method to the Canon EF mount:<br>Back Focus Adjustment for Prosilica Cameras |  |
| 4. | Connect the power supply to the camera and Canon EF adapter according to the labeled leads on the power supply. | |
| 5. | Connect the Canon EF adapter DB9 connector to the camera using the DB9 to Hirose adapter or directly to the host PC; refer to the Canon EF Lens Control section below for more detail. | |

## Canon EF Lens Control

The Canon EF mount uses RS232 communication.  The user can route the communication directly to the PC COM port or use the camera's RS232 port accessible via the Hirose connector at the back of the camera.

### Serial port configuration

The parameters listed on the right need to be configured on the camera's RS232 port in order to communicate with the Canon EF adapter

BAUD -  115200
Data bits - 8 bit
Parity – none
Stop bits – 1
Flow Control – None

### Commands

To test the Canon EF lens out of the box, use the Prosilica SampleViewer.  To do this, you will need to connect the adapter to the camera via the DB9 to Hirose adapter.  Once communication with the camera has been established select the "1101" icon in the camera window to launch the SerialIO terminal window.  This program is similar to windows hyperterminal.  Commands presented in the quick reference table on the next page are used to control the lens.  Use the Serial IO terminal window to issue commands to the Canon EF adapter.  Begin by initializing the focus and iris axis using the commands listed below:

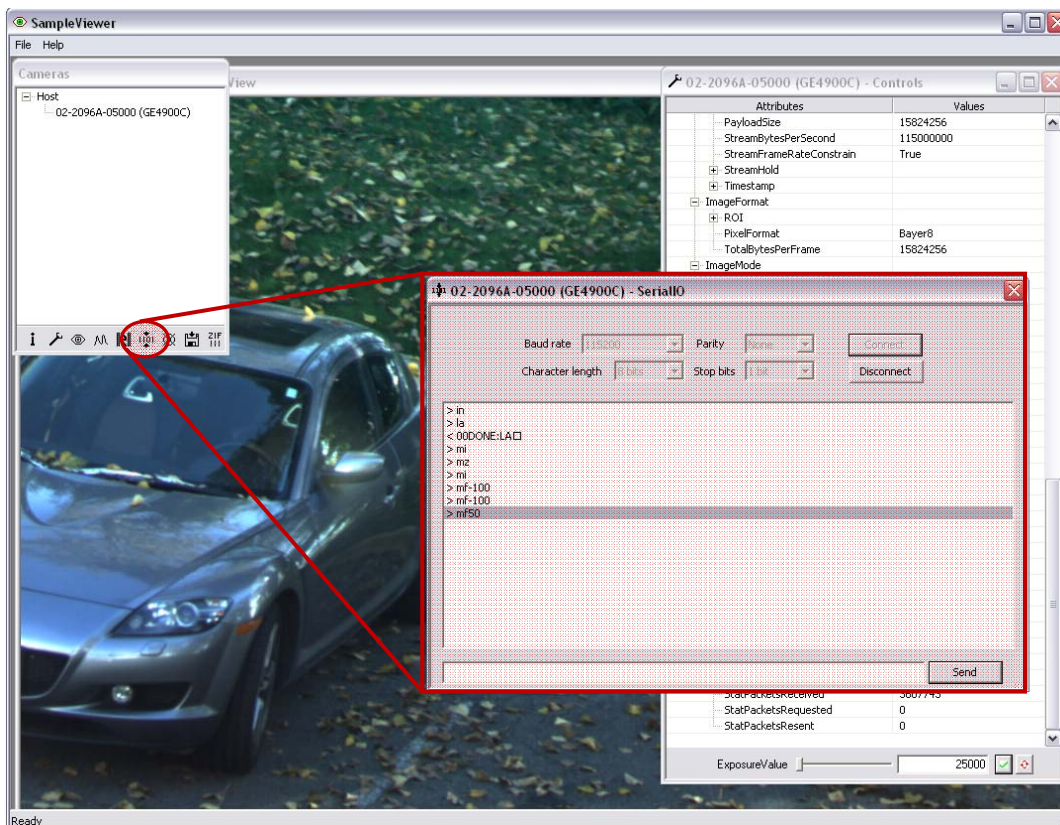"in" - Initialize the aperture motor
"la"- Learn the focus range



**Figure** – Screenshot of "1101" control window in Sample Viewer

| Command | Arguments | Description |
|---|---|---|
| | | |
| bv | | Print the bootloader version. |
| da | | Print aperture information. |
| de | | Dump EEPROM. |
| ds | | Print distance stops. |
| dz | | Print the zoom range. |
| eh | pos,checksum | Set absolute lens focus position (0…0x3FFF). |
| ex | | Exit to the bootloader. |
| fa | position | Move focus to absolute position. |
| fd | | Print focus distance range. |
| ff | position | Fast focus. |
| fp | | Print the raw focus positions. |
| gs | | Echo current device and lens statuses. |
| hv | | Print the hardware version. |
| id | | Print basic lens identification (zoom and f-number). |
| in | | Initialize the aperture motor. Aperture will fully open. |
| is | {0, 1} | Turn image stabilization off/on. |
| la | options | Learn the focus range. |
| lc | | Print cached lens status |
| ll | | Library loaded check. |
| lp | | Lens presence. |
| ls | | Query lens for status immediately and print. |
| lv | | Print the library version string. |
| ma | stop | Move aperture to absolute position. |
| mc | | Move aperture to the fully stopped down limit. |
| mf | | Move focus incremental. |
| mi | | Move focus to the infinity stop. |
| mn | num_stops | Move aperture incremental. |
| mo | | Move aperture to completely open. |
| mz | | Move focus to the zero stop. |
| pa | | Print the aperture position. |
| pf | | Print the focus position. |
| pl | {0, 1} | Lens power |
| rm | verbose[,new] | Set response modes. |
| se | byte,val | Temporarily set non-volatile (EEPROM) byte. |
| sf | count | Set the focus counter. |
| sg | port,state | Set GPIO. |
| sm | mode_flags | Set special modes. |
| sn | | Print the device serial number. |

**Table** – Canon EF Library Command Quick Reference

### Connecting the Canon EF adapter to the Camera

Connect the Canon EF adapter to the Rx and Tx pins found on the Hirose connector at the back of the Prosilica GE and Prosilica GX camera. The DB9 to Hirose adapter provided allows you to do this without additional harnessing. This approach routes communication via the Ethernet cabling and eliminates serial IO cabling between the host PC and the Canon EF adapter. The figure below highlights the Hirose connector at the back of the GX camera.
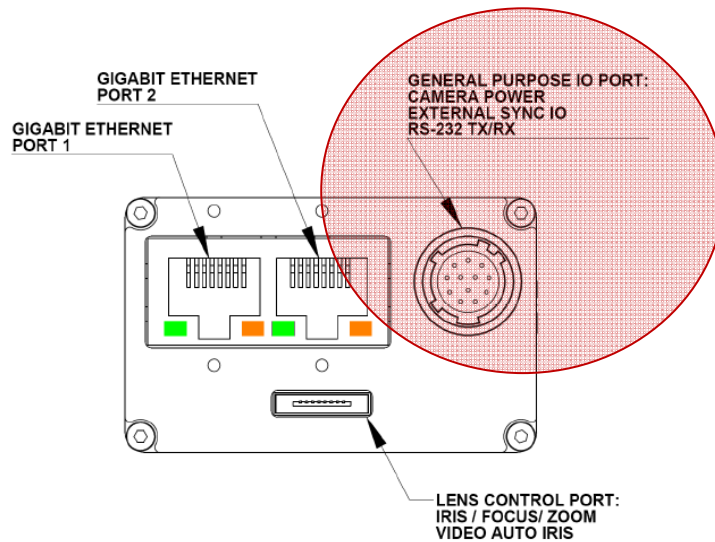


**Figure** – Prosilica GX Connection Diagram

### Develop your own application using PvAPI

Applications using the Prosilica GE and Prosilica GX cameras can be developed with the PvAPI SDK from Allied Vision Technologies. This software development kit is used to control the camera's RS232 port; this is how commands to the Canon EF adapter are issued. Reference "siotest" sample code included with the SDK to configure the RS232 communication identified in the Command Quick Reference table presented above.

For a complete listing of commands, refer to The Birger EF232 manual found here: http://www.birger.us/products/lens_controller/manuals/canon_ef232/Canon%20EF-232%20Library%20User%20Manual%201.2.pdf

### Connect the Canon EF adapter directly to the Host PC

Instead of connecting the Canon EF adapter to the camera RS232 port, users can also connect the adapter to a COM port on the PC. A serial command Terminal window such as Hyperterminal from Windows can be used to establish RS232 communication with the Canon EF adapter and control the lens. This approach will allow you to control the Canon EF lens directly without the use of PvAPI. It will however necessitate the installation of Serial IO cabling between the host PC and the Canon EF adapter.

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