**May**

2014

**IQ Inc.**

08

**Fall**

**Revision History**

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Ubuntu GigE Configurator: System Requirements Specification

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| --- | --- | --- | --- |
| Author | Description of Changes | Version | Date |
| Stephen T. Ruzzini | Original Document | 1.0 | 5/19/2014 |
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# Introduction

## Purpose

The purpose of this document is to describe and outline the software and system requirements for the Ubuntu GigE Configurator (UGC). The intended audience of this document is the IQ Inc. and Cirle development teams.

## Scope

This requirements document shall describe the software requirement specifications for the UGC. The UGC shall implement all functionality needed to configure current and persistent IP settings for Point Grey Blackfly GigE cameras.

## Definitions, Acronyms, and Abbreviations

* **GigE** – Gigabit Ethernet
* **UGC** – Ubuntu GigE Configurator
* **GUI** – Graphical user interface
* **VM** – Virtual Machine
* **PGBG** – Point Grey Blackfly GigE
* **IP** – Internet Protocol
* **GVCP** – GigE Vision Communication Protocol

## References

* *FlyCapture2 Documentation – Point Grey*

## Overview

The second section of this document describes the product, including high-level system functionality, user characteristics, and project constraints. This high-level view will provide context for the functional requirements detailed in the third section of this document.

# Overall Description

## Product Perspective

This self-contained product shall allow a user to configure IP settings for one or multiple Point Grey Blackfly GigE (PGBG) cameras.

### User Interface

The UGC shall provide a graphical user interface (GUI) to display all PGBG cameras connected to the computer, and all relative information about each camera (See section 3.1.1). Upon initialization, the GUI shall display a list of all connected cameras. The UGC shall not provide the user any ability to view or modify any settings not specified in this document.

### System Requirements

The following system requirements are necessary to run the UGC:

* Computer or VM running Ubuntu 14.04LTS Operating System with 2GB of RAM
* 1.7GHz processor (preferably faster)
* 1 or more gigabit Ethernet ports
* 1 or more gigabit Ethernet cables
* 1 or more PGBG cameras
* Computer Monitor (preferably 1024x640 resolution or greater)
* Mouse or Touch Screen Monitor (Only 1 monitor is needed)
* Keyboard

## Product Functions

The UGC shall provide the following functionality:

* Ability to select a camera from those that are connected to the computer
* Ability to view basic information (Serial Number, Model, Vendor, Sensor, etc.) of the selected camera
* Ability to modify current IP configuration (IP Address, Subnet Mask, and Default Gateway) of the selected camera
* Ability to modify persistent IP configuration (IP Address, Subnet Mask, and Default Gateway) of the selected camera
* See section 3.1 for more detailed information

## User Characteristics

The intended user for the UGC is a person familiar with Point Grey Cameras and GigE Vision Communication Protocol (GVCP).

# UGC Requirements

The UGC shall be responsible for providing the user the ability to view relevant PGBG camera information and modify IP settings.

## Functions

### Graphical User Interface

The UGC graphical user interface (GUI) shall implement the following requirements:

* The GUI shall display all connected PGBG cameras connected to the computer (See section 3.1.2).
* The GUI shall allow the user to refresh the connected cameras list to ensure all connected cameras are shown (See section 3.1.2).
* The GUI shall show, but not allowing modifying of, relevant camera information of a selected camera (See section 3.1.3):
* The GUI shall allow the user to modify current IP configuration of a selected camera (See section 3.1.4).
* The GUI shall allow the user to modify persistent IP configuration of a selected camera (See section 3.1.5).
* The GUI shall display all information in the English (US) language.

### Displaying Connected Cameras

The UGC shall implement the following functionality to display all connected cameras:

* Upon application startup, the UGC shall automatically populate a list of all connected PGBG cameras.
* Each camera in the list shall be represented by its unique serial number.
* The UGC shall provide the user the ability to manually request a refresh of the camera list to ensure that all connected cameras are shown.
* When a refresh is requested, if any cameras are still connected, the UGC shall automatically select the first camera in the list. (The UGC shall not refresh automatically when cameras are connected or disconnected)
* Upon application startup or camera list refresh, the UGC shall only be responsible for showing PGBG cameras. No other cameras shall be supported.
* The connected cameras list shall only allow for one camera to be selected at a time.
* When a user selects a camera from the list, it shall become the selected camera and populate the GUI with all information relevant to it (See section 3.1.3; 3.1.4; and 3.1.5).

### Non-Editable Camera Information

The UGC shall display the following information when a PGBG is selected:

* When a PGBG camera is selected from the connected cameras list, it shall show the following non-editable information:
  + Serial Number
  + Model
  + Vendor
  + Sensor
  + Resolution
  + Firmware (version and build date)
  + GigE Version
  + User Defined Name
  + XML URL 1 and 2
  + MAC Address
* This information shall not be editable to the user.
* Upon camera selection, all previously mentioned fields shall be updated to reflect the selected camera.
* If no camera is selected, all previously mentioned fields shall be left empty.

### Current IP Configuration

The UGC shall display and allowing editing of the following current IP configuration information:

* When a PGBG camera is selected from the connected cameras list, it shall show and allow editing of the following current IP configuration information:
  + IP Address
  + Subnet Mask
  + Default Gateway
* This information shall be editable by the user.
* Upon camera selection, all previously mentioned fields shall be updated to reflect the selected camera.
* If no camera is selected, all previously mentioned fields shall be left empty.
* The user shall be given the ability to manually write these editable fields back to the selected camera.
* When a user selects to write these changes back to the selected camera they shall be checked to make sure that they are valid IP settings, and will not be written to the camera unless they are valid.

### Persistent IP Configuration

The UGC shall display and allowing editing of the following persistent IP configuration information:

* When a PGBG camera is selected from the connected cameras list, it shall show and allow editing of the following persistent IP configuration information:
  + IP Address
  + Subnet Mask
  + Default Gateway
* This information shall be editable by the user.
* Upon camera selection, all previously mentioned fields shall be updated to reflect the selected camera.
* If no camera is selected, all previously mentioned fields shall be left empty.
* The user shall be given the ability to manually write these editable fields back to the selected camera.
* When a user selects to write these changes back to the selected camera they shall be checked to make sure that they are valid IP settings, and will not be written to the camera unless they are valid.
* The user shall be given the ability to manually copy fields from the current IP configuration to the persistent IP information. This will update all persistent IP configuration GUI fields as well as write back all persistent IP configuration settings to the selected camera.

## Performance

The UGC shall adhere to the following performance requirements:

* The UGC shall only have one GUI.
* The UGC shall be capable of identifying as many connected PGBG cameras as there are GigE ports on the computer.
* The UGC shall only be operated by one user at a time.

## Portability

UGC functionality shall only be guaranteed on computers meeting the requirements described in Section 2.1.2 of this document.

## System Attributes

### Reliability

* The UGC shall show the most up to date PGBG cameras connected to the computer upon application startup, and when the user manually refreshes the list.
* The UGC shall show the most up to date PGBG camera information selected upon application startup, refresh, or directly after a user writes to the camera.
* The UGC shall never write invalid IP data to a connected PGBG camera.
* The UGC shall detect all connected PGBG cameras upon application startup or refresh.

### Availability

* The UGC shall remain open and running continuously from application startup until the user exits the application.