Adaptive Vision

Intuitive

Powerful

Adaptable

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Application Note

Interfacing Photoneo scanner to Adaptive Vision Studio

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Contents

1. Purpose and equipment

Purpose:

This document explains how to interface a PhoXi 3D Scanner to Adaptive Vision Studio.

Required equipment:

PhoXi Control v1.2.6 or later

Adaptive Vision Studio 4.11 Professional or later

2. Overview

A PhoXi 3D Scanner is an advanced sensor created by Photoneo. It is purposed for 3D machine vision and processing point clouds. The PhoXi 3D Scanner has many functionalities including:

- Scanning objects and representing them as a point cloud or intensity images,
- Various representations of scans.

3. Getting started with a PhoXi 3D Scanner in Adaptive Vision Studio

At the beginning download proper version of PhoXiControl from producer's website and install it. Follow these steps:

1. Connect a PhoXi 3D Scanner to the PC by running Adaptive Vision Studio Professional.
2. Power up the PhoXi 3D Scanner, connect it to the PC via Ethernet interface.
3. Open PhoXi Control application.
4. Copy ID of the scanner you would like to use in Adaptive Vison Studio.

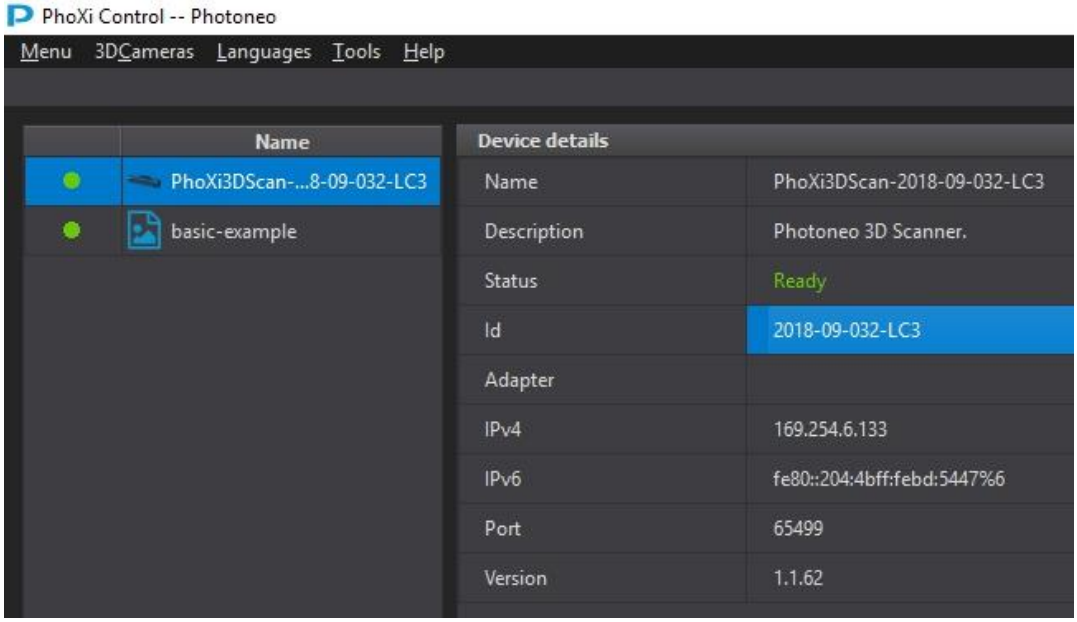


Figure 1- ID checking in PhoXi application.

5. To use PhoXi 3D Scanner its Status should be "Ready".
6. Adaptive Vision Studio provides the following filters for communication with Photoneo's 3D scanners:

    1) Photoneo_StartAcquisition
    2) Photoneo_StopAcquisition
    3) Photoneo_GenerateSoftwareTrigger
    4) Photoneo_SetParameters
    5) Photoneo_GetParameters
    6) **Photoneo_GrabPoint3DGrid**
    7) Photoneo_GrabNormals
    8) Photoneo_GrabTexture
    9) Photoneo_GrabDepthMap
    10) Photoneo_GrabConfidence

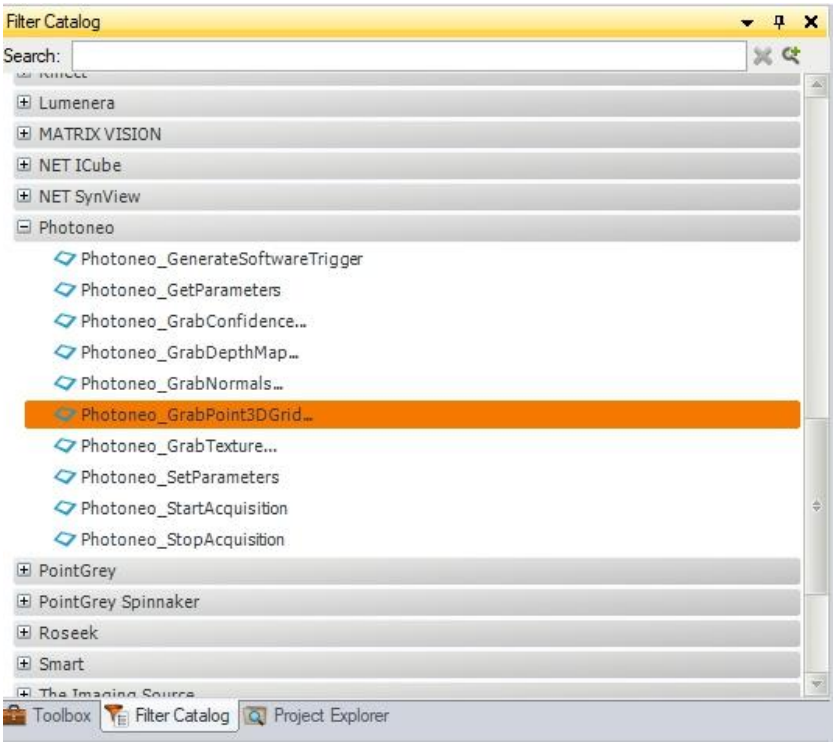


Figure 2 – Available filters in Adaptive Vision Studio dedicated for Photoneo scanners.

7. At the beginning create simple program with **Photoneo_GrabPoint3DGrid** filter to test the connection. Find **Photoneo_GrabPoint3DGrid** filter in Filter Catalog or in Toolbox (category *Image Acquisition (Third Party)*), drag and drop it to main program.

8. Paste ID (from step 4) into *inDevice* input. If you do not have access to any Photoneo scanner, but you would like to test connection between PhoXiControl and Adaptive Vision Studio, please enter “InstalledExamples-basic-example” into *inDevice* input.

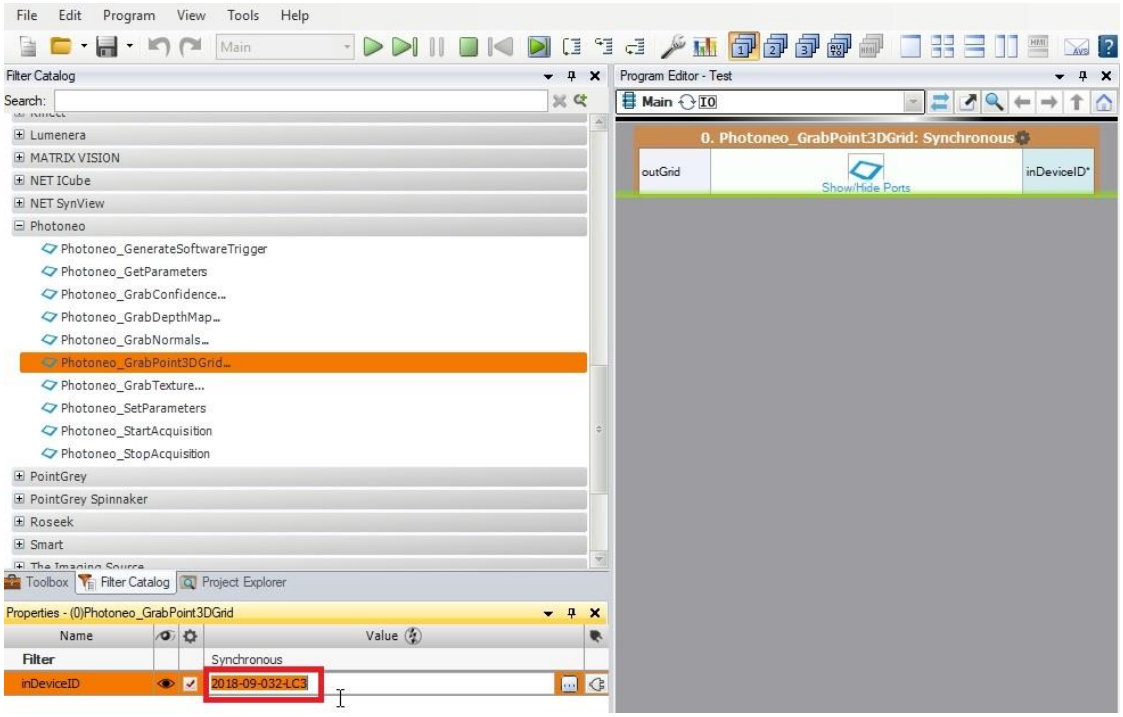


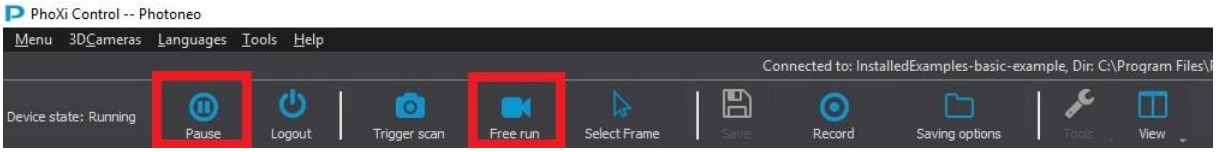
Figure 3 - Simple program in Adaptive Vision Studio.

9. Connect *outGrid* output to preview window and run program. If everything is done correctly, you should get Point3DGrid with scanned object.

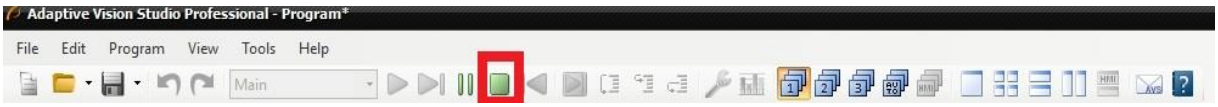
4. Troubleshooting

If you had any problems during the connection process, you can find some solutions here.

- Make sure you can grab cloud of point in PhoXi Control application. If you cannot, please check connection and change the properties of acquisition.
- Make sure you are using proper version of Adaptive Vision Studio and PhoXi Control application (from chapter 1).
- Make sure that device is in running mode. If it is necessary Unpause device in PhoXI Control and use Free run, then you should be able to grab Point3DGrid in Adaptive Vision Studio.



- You are not be able to change parameters in PhoXi Control application, while a program in Adaptive Vision Studio is running and acquiring data from a scanner. You can stop a program by clicking Stop button or using Shift + F5 key combination.



If you encounter a problem that has not been mentioned above, please do not hesitate to contact us, so that we could investigate it and add the description of its solution to this section.

5. Calibration

Point's coordinate system is defined by scanner's camera position and its specific angle depending on PhoXi 3D Scanner type. You can read more about Coordinate spaces of Photoneo scanners in this document.

You can align coordinate system position by following this instruction. After completing steps outlined by the manufacturer, the coordinate system will be changed also in case of scans acquired with Adaptive Vision Studio.

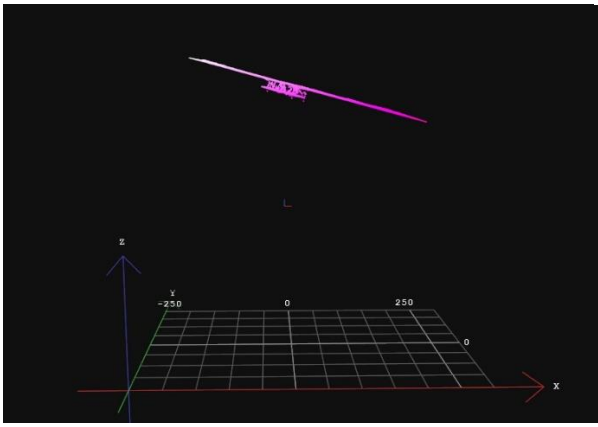


Figure 4 - Point3DGrid before calibration.

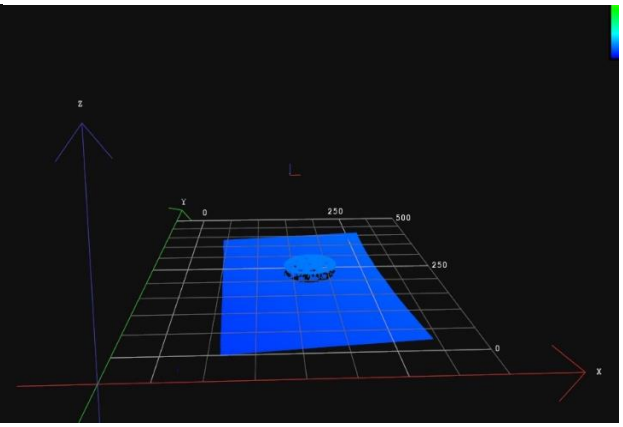


Figure 4 - Point3DGrid after calibration.

6. Setting parameters and maps reading

Default parameters of PhoXi 3D Scanner is shown below.

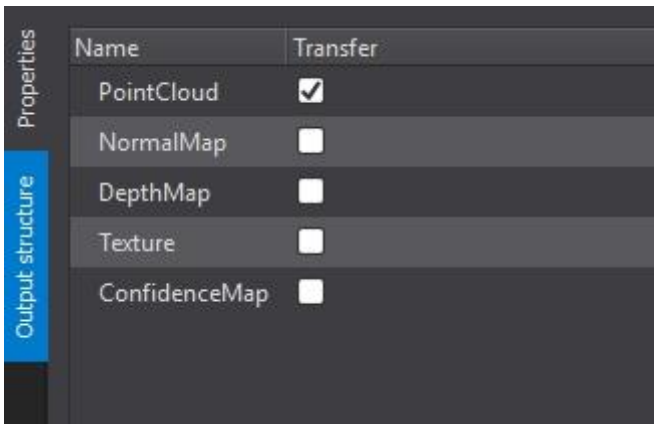


Figure 5 - Basic setting.

These settings does not allow to send Normal maps, Depth maps, Confidence maps and Textures to Adaptive Vision Studio application.

To make it possible, you need to change the parameters using Photoneo_SetParameters filter, which should be executed at the very beginning of program or between Photoneo_StopAcquisition and Photoneo_StartAcquisition filters.

If parameters, responsible for maps reading, will be set as True, you can use proper filters (Photoneo_GrabNormals, Photoneo_GrabTexture, Photoneo_GrabDepthMap, Photoneo_GrabConfidence) to acquire respective maps to Adaptive Vision Studio application..

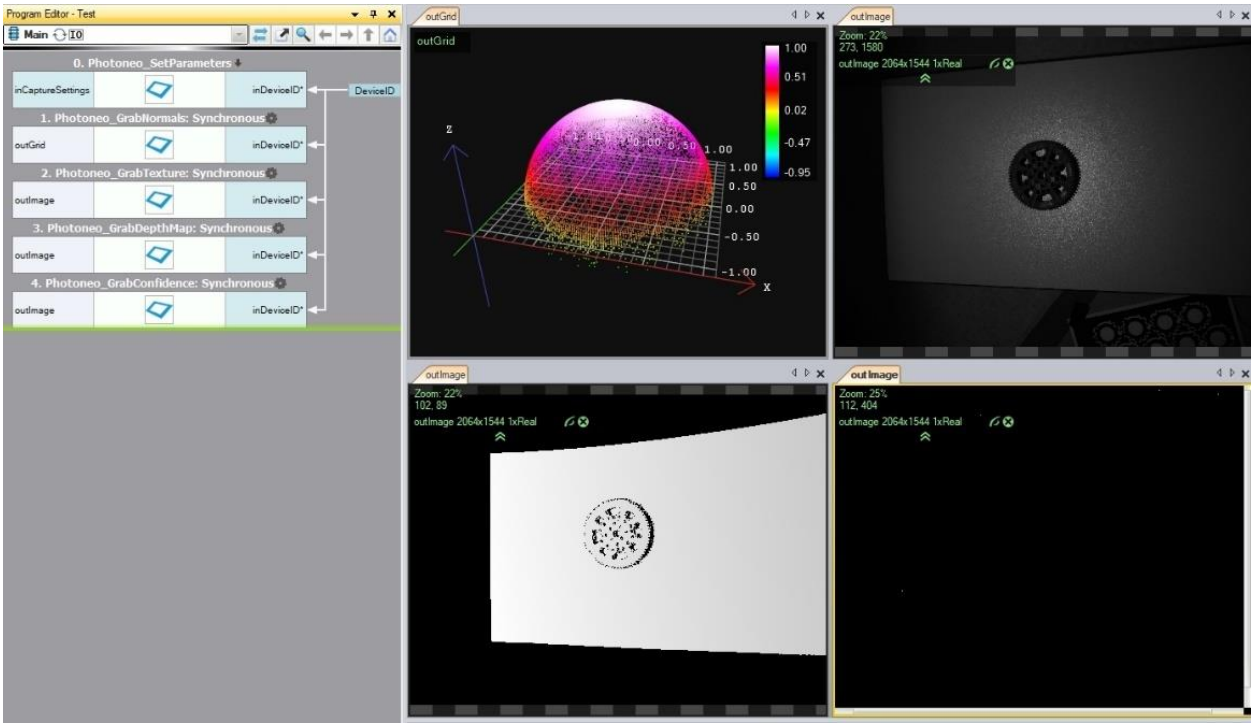


Figure 6 - Sample program for maps grabbing.