



Software User Guide (EN)

PGC-1000 Grabber Card

Rev. 1.2.8

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01 Introduction

This Software User Guide is an extension to the PGC-1000 User Guide and explains the aspects of software-installation, updating and accessing the driver from own software-applications. Be sure to read the User Guide first.

02 Installation of the PGC-1000 Windows Driver

The PGC-1000 Windows driver can be installed by doing a right click on the supplied .inf file and choosing »Install«.

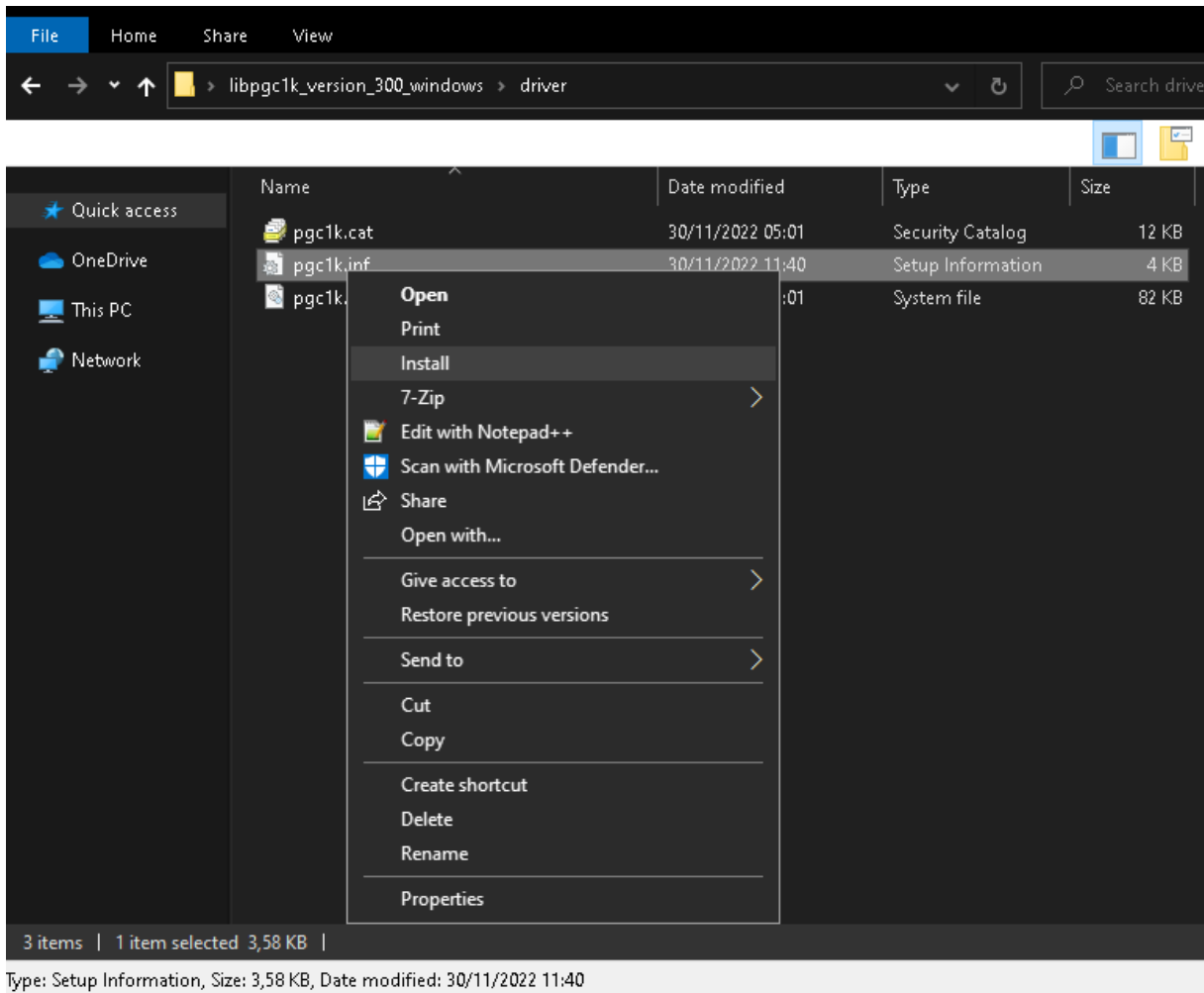


Figure 1: Driver Installation

03 Setting up the PGC-1000 Interfaces

To find out, which PGC-1000 interfaces are mapped to which Ethernet adapters in Windows, you have to take a look at the MAC addresses of the available Ethernet adapters and identify the different PGC-1000 interfaces.

To do this, open the Windows command console (cmd) and execute the following command:

```
ipconfig /all
```

A possible output is shown below:

```
Ethernet adapter Ethernet 4:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : PGC1K Device
    Physical Address. . . . . : E8-B4-70-A0-00-00
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes

Ethernet adapter Ethernet 13:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : PGC1K Device #2
    Physical Address. . . . . : E8-B4-70-A0-00-02
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

Ethernet adapter Ethernet 16:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : PGC1K Device #3
    Physical Address. . . . . : E8-B4-70-A0-00-01
    DHCP Enabled. . . . . : No
    Autoconfiguration Enabled . . . . : Yes

Ethernet adapter Ethernet 17:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :
    Description . . . . . : PGC1K Device #4
    Physical Address. . . . . : E8-B4-70-A0-00-03
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
```

Figure 2: ipconfig /all example output

In this example, the following Ethernet adapters are mapped to different PGC-1000 interfaces:

- PGC-1000 interface 1 -> Ethernet adapter Ethernet 4
- PGC-1000 interface 2 -> Ethernet adapter Ethernet 16
- PGC-1000 interface 3 -> Ethernet adapter Ethernet 13
- PGC-1000 interface 4 -> Ethernet adapter Ethernet 17

When the mapping of the PGC-1000 interfaces is known, the IPs of the interfaces have to be set manually, so that a communication with the remote node is possible.

To manually set the IPs, go to the windows network settings, select the Ethernet adapter for which you want to set the IP and click on »edit«.

You can now set your IP and gateway. An example is shown in the following image:



Figure 3: Set an IP manually

04 Using the PGC-1000 Updater

1. To update the PGC-1000 with the PGC updater tool, open PGC_Updater.exe.
The GUI of the updater tool is shown in the following picture:

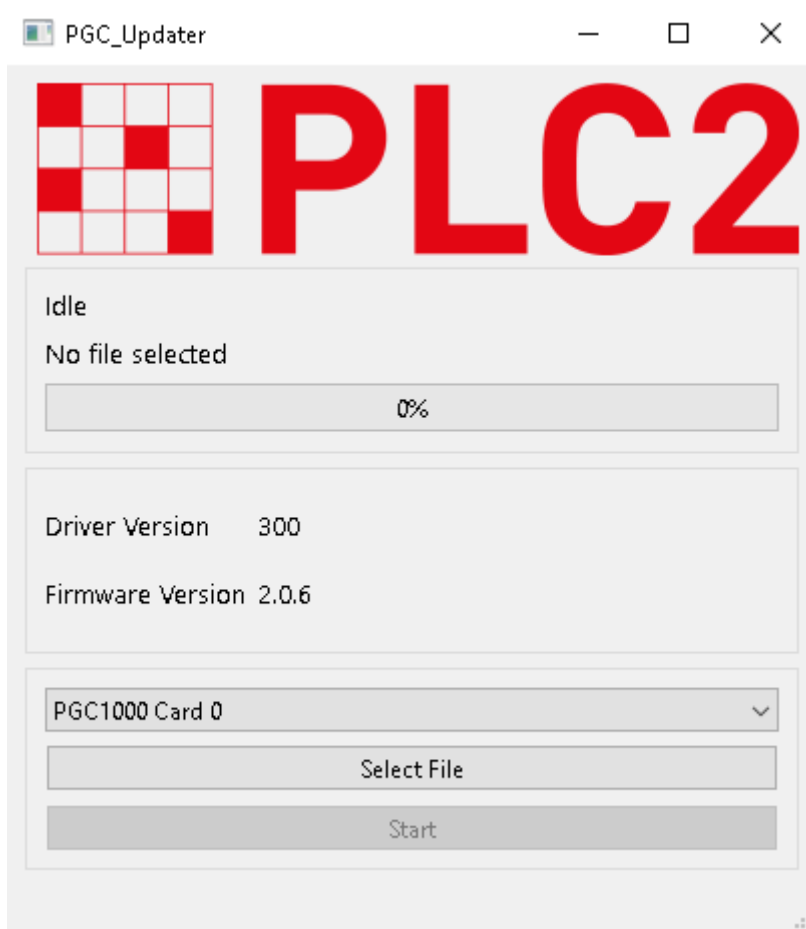


Figure 4: PGC Updater

2. The currently installed driver version and the firmware version of the PGC-1000 is displayed. To update the PGC-1000 click on »Select File« and choose a firmware image file (.bin) with which you want to update the PGC-1000.
3. Click on »Start«.
The progress of the flashing process is shown.
4. After the PGC-1000 is flashed, it is necessary to power-cycle the system.
5. To check if the PGC-1000 was flashed with the expected firmware version, open the PGC updater tool and check the displayed firmware version.

05 Configure VisualStudio 2019 for Libpgc1k

To use the user-space library, add the include path and the library path to your VisualStudio 2019 project.

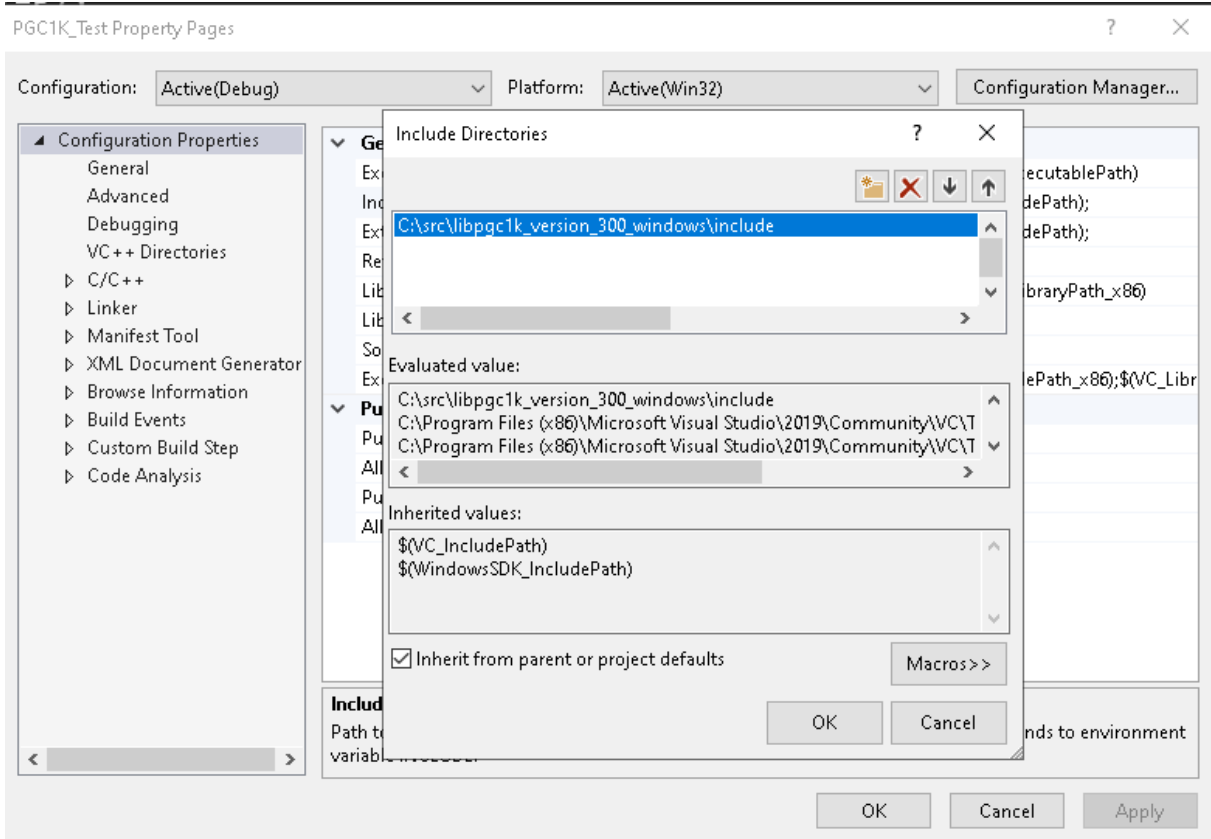


Figure 5: VisualStudio 2019 include settings

After that, you need to add the library to your linker library dependencies.

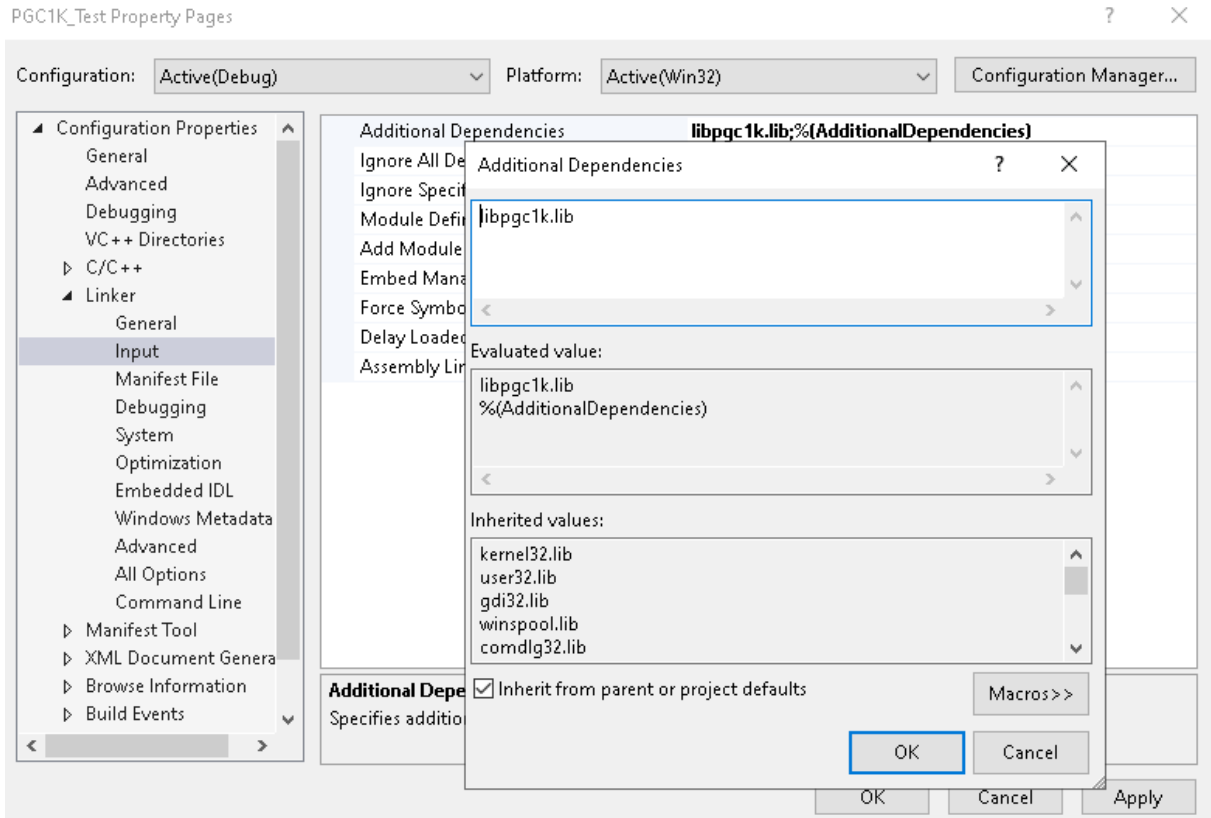


Figure 6: Linker library dependencies

The library uses C++17 features. Make sure to set the C++ language standard in VisualStudio 2019 to »ISO C++17 Standard (/std:c++17)<.

06 Libpgc1k initialization

You need to initialize the library before you can call any other library functions.

```

pgc1k::pgc_config cfg;
cfg.debug = true;

/* initialize the library */
try {
    pgc1k::init(cfg);
} catch(const pgc1k::error &err) {
    printf("Libpgc1k init failed: %s\n",err.what());
    exit(-1);
}
    
```

pgc1k::init() throws pgc1k::error if the initialization fails.

07 Camera Device Discovery and Handling

Ethernet camera devices need to be discovered and synchronized before they can be used. Libpgc1k does the synchronization by itself if it discovers a device. The device discovery is disabled by default and needs to be enabled with `>>pgc1k::cam::enable_auto_discovery(true)<<`.

The synchronization can take some time depending on the device. You can use `pgc1k::cam::wait_for_cameras` to wait for a specific amount of devices or check if a device is ready with `pgc1k::cam::wait_for_camera_ready`.

The Libpgc1k event `new_camera_found` gets triggered if a device was found and `camera_ready` if a device finished synchronization.

08 Camera Device Configuration and Data Capture

A device needs to be configured before data can be retrieved. You can do this manually over the `pgc1k::gvcv` functions or use the recommended method by calling `pgc1k::cam::prepare_acquisition`. The acquisition can then be started by calling `pgc1k::cam::start_acquisition`.

Data is retrieved with the `pgc1k::get_data` function. The function fills a `data_t` struct with the camera data and additional metadata. `pgc1k::free_data` needs to be called for every call to `pgc1k::get_data` to tell the driver that the internal FIFO slot is no longer in use.

Make sure to call `pgc1k::stop_acquisition` if you are done.

09 Software Camera

Libpgc1k provides a software Ethernet camera implementation to use as a library local software camera. One software camera per available network interface can be created. Non PGC-1000 interfaces can be registered with `pgc1k::register_native_interface`. A software camera behaves like a remote hardware camera and can be used with all camera-related functions. Call `pgc1k::softcam::create_software_camera` to create a software camera.