How to set up a computer to use PTCS

EVT9 – PTCS Computer Setup

Version 3.0

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| 3.0 | 12/13/2019 | Updates from Rohan |
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| 4.0 | 1/17/2020 | Updated the installation link picture, removed msi installer picture, explained pip and linked to its documentation, explained packages used. |
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EVT9 – PTCS Computer Setup

# Introduction

This document aims to specify the minimum software requirements for a computer to successfully run PTCS. Only a computer with an operating system on the ***Confirmed Compatibility*** list is able to be used for running PTCS.

# Operating System

The developers have heavily tested the software on the operating systems under ***Confirmed Compatibility***, but do not see any reasons why the software would not work on operating systems under ***Assumed Compatibility,*** and are confident that the software is not currently compatible with operating systems under ***Not Compatible*** list.

If a user wants to use another operating system other than one in ***Confirmed Compatibility***, they should have a developer fully test and confirm functionality of the software on said OS, and then have them modify this document to move that OS under the ***Confirmed Compatibility*** section.

## Confirmed Compatibility

Windows Server 2016 Datacenter

## Assumed Compatibility

Windows 10

Windows 7

## Not Compatible

Any Linux kernel based operating system, including macOS (but it should not be too hard to support if necessary).

# NI-VISA

In order for the python program to run, there needs to be some interface standards that implement all the different ports that an instrument could be connected to.

## Installation

Go to <https://www.ni.com/en-us/support/downloads/drivers/download.ni-visa.html#329456> and download version 18.5 for Windows. All you have to change is **Version** the drop-down to 18.5

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| Figure : Which NI-VISA version to download |
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Go through the whole installation with default settings.

# Python

PTCS is compliant with ***Python 3.7*** (cpython). This is the only version currently supported.

## Installation

If a Python3.7 version is not already installed on your computer, follow these steps:

* Download the most current version on python 3.7. Currently the most recent version is 3.7.4. The download link is [here](https://www.python.org/ftp/python/3.7.6/python-3.7.6-amd64.exe). If a new version has come out since this document’s creation, find and install the correct version for your operating system on [this webpage](https://www.python.org/downloads/). On Windows 10/Server it will be the Windows x86-64 MSI installer.

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| Figure 1: Which installer to use |
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* Leave the options as they are and select ***Run***

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| Figure 2: Users to install for |
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* Check Add Python 3.7 to PATH
* Select ***Install Now***

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| Figure 3: Successful Installation |
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* Disable path length limit
* Select ***Close*** when the installer finishes

# Installing PTCS itself

## Accessing the software from a computer’s Desktop

Continue reading if the computer’s desktop does not already have the PTCS shortcut.

### Download the code

The code needs to be downloaded this [website](https://github.com/FuturePhotonInitiative/PTCS). Select the ***Clone or Download*** button and then select ***Download ZIP.***

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| Figure 4: Download the zip file |
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### Unzip the code

Navigate to the computer’s ***Downloads*** directory and use a file decompression tool to unzip the downloaded file.

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| Figure 5: Extract the zip file |
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### Move the code

Move the folder created previously to a safer directory than ***Downloads***. A suggested directory is ***Documents.***

### Create a shortcut

Open the moved folder and right click on the file named ***PICTestControlSoftware.pyw*** and select ***Send to > Desktop (create shortcut)***

### Rename the Shortcut

Navigate to the ***Desktop*** and rename the file a more useful name, like ***PTCS***.

# Dependency package installation

## Pip

[Pip](https://pip.pypa.io/en/stable/) is a package manager program that gets installed with Python. PTCS needs some of these packages to run, and pip knows how to download these from the internet.

## Using pip

Open up **Command Prompt**, navigate to the PTCS directory that all the other files are in and type the following command: ***pip install –r requirements.txt***. This will automatically download all the packages and their versions specified in requirements.txt from the internet.

The packages are the following:

* wxPython – 4.0.7

GUI creation (can show windows so the user to interact with the program without knowing how to use the terminal)

* pyVISA – 1.9.1

enables interaction with instruments through python

* contextlib2 – 0.5.5

utilities for using the “with” statement in python2. We are using this to make sure every device gets closed before the program exits.

* matplotlib – 3.1.2

creates graphs based on given data

* pywin32 – 227

ability to interact with windows specific operating system services (we are using to connect with the Agilent logic analyzer through its software)

* jsonschema – 3.0.1

lets a format be specified on top of the json file format

There are other packages in requirements.txt not mentioned above because these get automatically installed when one of the above packages gets installed.

# See if the Program Runs

Double click the PTCS icon that you created on the desktop. If the GUI comes up within 10 seconds, great!

If it does not start after 10 seconds, there may be an issue. Have a developer look at the issue. If you are on Blackdog, it may be the case that the program is opening with the wrong version of Python. Specify the program C:\Python27\pythonw.exe as the default application when right clicking the shortcut > Open with > Choose another app > More apps > Choose another app on this PC

Now that the installation is complete, feel free to follow the tutorial in the ***PTCS Customer User Guide – EVT6.***

# Appendix: PTCS Codebase README file

## What is *PTCS* ?

PTCS is a software tool that lets a user create and run tests by remotely connecting to measurement instruments and integrated circuits.

PTCS is being developed by the Center for Detectors at Rochester Institute of Technology

#### Features of PTCS

* Create, save and load a queue of pre-built tests
* Open result files through the UI
* Build a test through a GUI

#### Where Can I get PTCS?

PTCS is currently available from the [Future Photon Initiative public GitHub repository.](https://github.com/FuturePhotonInitiative/PTCS)

## User Guide

The user guide for the project is EVT6 located in the EVT project formal documentation folder: \hawkdocuments. Start by reading this document as it gives an overview of the functionality of the software.

#### Requirements to Run

Reading this document will point you to EVT9 which details the requirements to run the software. You should read this as well, but you do not need to do anything found in it because Blackdog (the computer that is used for PTCS development) is already set up.

#### Running TCL tests

EVT8 has some documentation about creating TCL based tests. Currently most use cases for this software have been implemented by writing and auto-generating python scripts. Sometimes it is useful to run a test that communicates with Vivado. Vivado can operate in headless mode by giving it a TCL script.

## Developer Documentation

After you read the above user guides but before you start reading the developer documentation below, you should read the New Developer Startup guide located in the supporting developer documentation folder: \hawkdocumentsDocumentationFall2019

#### Main Developer Document

The first developer document you should read is EVT11. It is the document that gives context to and glues all the files in the supporting developer documentation folder together. The supporting developer documentation folder is pretty much a copy of the folder we (Owen and Mark) used in Summer, but it is cleaned up. Feel free to edit these documents in the folder as the software changes. If there are any files in EVT11 that are not mentioned (other than the remote instrument communication data sheets) make sure you read over and understand them also.