# **Perkin Elmer IOC Creation**

This document describes a method to create Perkin Elmer IOC in both Windows 10 and Linux. How to build EPICS base and synApps module is also described. areaDetectors based IOCs for other detectors can be built similarly.

## **Get source code.**

Perkin Elmer IOC is built based on EPICS base, synApps (areaDetector).

### EPICS base

EPICS base source code can be downloaded from:

<https://epics.anl.gov/download/base/index.php>

### synApps

synApps source code can be downloaded from:

<https://www.aps.anl.gov/BCDA/synApps/Where-to-find-it>

### areaDetector

areaDetector is included in synApps. However, if you want to build on a newer version of areaDetector which in not in the synApps package, follow the instruction on

<https://github.com/areaDetector/areaDetector/blob/master/INSTALL_GUIDE.md>

To download the source code. Basically, you can always download the latest version of the source code by running command:

git clone --recursive <https://github.com/areaDetector/areaDetector.git>

Separate modules should be downloaded by cloning them from the repository. Be sure to update the driver. For Perkin Elmer, replace the following files:

* perkinElmerSupport/Acq.h
* perkinElmerSupport/os/windows-x64/XISL.lib,
* gbif64.dll
* libxml2\_x64.dll
* XISL.dll

### Detector driver

Make sure the driver is up to date.

## **Install tools/libraries for the compilation**

Building EPICS base requires the following libraries to be installed:

* libreadline-dev
* gcc
* g++

Building Perkin Elmer IOC requires tools like make, Perl, re2c, and Visual Studio (Windows).

|  |  |  |
| --- | --- | --- |
| **Module** | **Platform** | **Download** |
| Perl | Windows | <http://strawberryperl.com/> |
| make | Windows |  |
| re2c | Linux | <http://re2c.org/install/install.html> (source code) |
| Windows | <https://sourceforge.net/projects/re2c/> (binary) |
| Visual Studio | Windows | <https://visualstudio.microsoft.com/vs/community/> |
| libusb-xxx-dev | Linux | sudo apt-get install libusb-1.0-0-dev |
| libx11-dev | Linux | sudo apt-get install libx11-dev |
| libxext-dev | Linux | sudo apt-get install libxext-dev |
| libusb-dev | Linux | sudo apt-get install libusb-dev |

## **Compilation environment setup**

To compile EPICS base and packages/IOCs, EPICS\_HOST\_ARCH must be set. In Windows 10:

|  |
| --- |
| set EPICS\_HOST\_ARCH=windows-x64-static |

Paths to make/Perl/EPICS bin must be set. In Windows 10:

|  |
| --- |
| PATH=C:\Software\make;C:\Software\Strawberry\perl\bin;C:\epics\base-7.0.0.1\bin\windows-x64-static;%PATH% |

Execute the Visual Studio batch file for 64-bit builds in Windows:

|  |
| --- |
| "C:\Software\VS2017Community\VC\Auxiliary\Build\vcvarsall.bat" x86\_amd64 |

## Building the programs

### Building EPICS base

To run static build of EPICS base, edit base-xxx/configure/CONFIG\_SITE and set:

|  |
| --- |
| SHARED\_LIBRARIES=YES  STATIC\_BUILD=NO |

### Building synApps

* First, run **make release** in *synApps/support/* to pass the definition of **EPICS\_BASE** and **SUPPORT** across synApps modules.
* Define **RE2C** in *seq-x-x/configure/CONFIG\_SITE*.
* Remove the modules that are not needed in Makefile.
* If areaDetector source code is downloaded separately:
* In *areaDetector/configure/*, run commands:

|  |
| --- |
| cp EXAMPLE\_RELEASE.local RELEASE.local  cp EXAMPLE\_RELEASE\_SUPPORT.local RELEASE\_SUPPORT.local  cp EXAMPLE\_RELEASE\_LIBS.local RELEASE\_LIBS.local  cp EXAMPLE\_RELEASE\_PRODS.local RELEASE\_PRODS.local  cp EXAMPLE\_CONFIG\_SITE.local CONFIG\_SITE.local |

* Define **SUPPORT** in *RELEASE\_SUPPORT.local*
* Define **ASYN**, **AREA\_DETECTOR** and **EPICS\_BASE** in *RELEASE\_LIBS.local*. Set
* Define **AUTOSAVE**, **BUSY**, **CALC**, and **SSCAN** in *RELEASE\_PRODS.local*. **SSEQ**, **DEVIOCSTATS** and **ALIVE** are optional.
* Set **WITH\_BOOST**=YES or NO in *CONFIG\_SITE.local*. **WITH\_PVA**=YES for using PVaccess (need EPICS base support), otherwise set **WITH\_PVA**=NO.
* Uncomment the lines for the modules to be complied in *configure/RELEASE.local*

## Post-building

* After build, in ADCore/iocBoot, run commands:

|  |
| --- |
| cp EXAMPLE\_commonPlugins.cmd commonPlugins.cmd  cp EXAMPLE\_commonPlugin\_settings.req commonPlugin\_settings.req |

and edit the two files for optional modules.

* In Windows, edit areaDetector-3-3-2\ADPerkinElmer\iocs\perkinElmerIOC\iocBoot\ iocPerkinElmer\start\_epics.bat:
* remove the first line;
* for static build, change the path of perkinelmerApp from *..\..\bin\windows-x64\* to *..\..\bin\windows-x64-static\*

Perkin Elmer IOC is now ready to run.