

# KLayout Productivity Suite Documentation

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## 1 Introduction

### 1.1 Motivation

TODO

### 1.2 Acknowledgements

TODO

### 1.3 About KLayout Productivity Suite

KLayout is an open source VLSI layout viewer and editor.

The *KLayout Productivity Suite* is a set of plugins to boost your layout productivity developed by the **Department for Integrated Circuits (ICD), Johannes Kepler University (JKU)**.

The available plugins are listed in the table below.

Title	Description	Repository URL
Align Tool Plugin	Tool to align layout objects	<a href="https://github.com/iic-jku/klayout-align-tool">https://github.com/iic-jku/klayout-align-tool</a>
Automatic Backups	Create automatic backups of edited layouts	<a href="https://github.com/iic-jku/klayout-auto-backup">https://github.com/iic-jku/klayout-auto-backup</a>
Layer Shortcuts Plugin	Shortcuts to quickly change layer visibility	<a href="https://github.com/iic-jku/klayout-layer-shortcuts">https://github.com/iic-jku/klayout-layer-shortcuts</a>
Library Manager Plugin	Library manager for hierarchical layouts	<a href="https://github.com/iic-jku/klayout-library-manager">https://github.com/iic-jku/klayout-library-manager</a>

Title	Description	Repository URL
Move Quickly Tool Plugin	Tool to quickly move layout objects	<a href="https://github.com/iic-jku/klayout-move-tool">https://github.com/iic-jku/klayout-move-tool</a>
Pin Tool Plugin	Efficient placement of pins	<a href="https://github.com/iic-jku/klayout-pin-tool">https://github.com/iic-jku/klayout-pin-tool</a>
Plugin Utilities Library	Utility library used by various IIC KLayout plugins	<a href="https://github.com/iic-jku/klayout-plugin-utils">https://github.com/iic-jku/klayout-plugin-utils</a>

### 💡 Tip

The *KLayout Productivity Suite* source code itself is made publicly available on GitHub and shared under the GPL-3.0 license (see links above in table above).

KPEX documentation source code is made publicly available on GitHub ([follow this link](#)) and shared under the Apache-2.0 license.

Please feel free to create issues and/or submit pull requests on GitHub to fix errors and omissions! The production of the tool and this document would be impossible without these (and many more) great open-source software products: **KLayout**, **Quarto**, **Python**, **ngspice**, **Numpy**, **Scipy**, **Matplotlib**, **Git**, **Docker**, **Ubuntu**, **Linux**...

## 1.4 Installation

Generally, the plugins can be installed using the KLayout Package Manager.

- **KLayoutProductivitySuite** is a meta-package, that will install all of the plugins
- Alternatively, single plugins can be cherry-picked using the plugin title in the above table (without whitespace)

As for the dependencies, there are multiple options available.

### 1.4.1 Option 1: Using IIC-OSIC-TOOLS Docker Image

We provide a comprehensive, low entry barrier Docker image that comes pre-installed with most relevant open source ASIC tools, as well as the open PDKs. This is a pre-compiled Docker image which allows to do circuit design on a virtual machine on virtually any type of computing equipment (personal PC, Raspberry Pi, cloud server) on various operating systems (Windows, macOS, Linux).

For further information please look at the [Docker Hub page](#) and for detailed instructions at the [IIC-OSIC-TOOLS GitHub page](#).

### ⚠️ Linux

In this document, we assume that users have a basic knowledge of Linux and how to operate it using the terminal (shell). If you are not yet familiar with Linux (which is basically a must when doing integrated circuit design as many tools are only available on Linux), then please check out a Linux introductory course or tutorial online, there are many resources available.

A summary of important Linux shell commands is provided in [IIC-JKU Linux Cheatsheet](#).

### 1.4.2 Option 2: Standalone Installation

- [KLayout](#) layout tool:
  - is mandatory for all engines (besides the MAGIC-wrapper)
  - [get the latest pre-built package version](#)
  - [or follow the build instructions](#)
- [Skywater sky130A PDK](#):
  - optional
  - `pip3 install --upgrade ciel` (install PDK package manager)
  - `ciel ls-remote --pdk sky130A` (retrieve available PDK releases)
    - \* for example PRE-RELEASE 0c1df35fd535299ea1ef74d1e9e15dedaeb34c32 (2024.12.11)
  - `ciel enable --pdk sky130A 0c1df35fd535299ea1ef74d1e9e15dedaeb34c32` (install a PDK version)
  - PDK files now have been installed under `$HOME/.volare/sky130A`
- [IHP SG13G2 PDK](#):
  - optional
  - `pip3 install --upgrade ciel` (install PDK package manager)
  - `ciel ls-remote --pdk ihp-sg13g2` (retrieve available PDK releases)
    - \* for example PRE-RELEASE cb7daaa8901016cf7c5d272dfa322c41f024931f (2025.07.18)
  - `ciel enable --pdk ihp-sg13g2 cb7daaa8901016cf7c5d272dfa322c41f024931f` (install a PDK version)
  - PDK files now have been installed under `$HOME/.volare/ihp-sg13g2`