KiCad

The KiCad Team

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KiCad 10.0 Reference Manual

Соавторы

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Отзывы

The KiCad project welcomes feedback, bug reports, and suggestions related to the software or its documentation. For more information on how to submit feedback or report an issue, please see the instructions at https://www.kicad.org/help/report-an-issue/

Software and Documentation Version

This user manual is based on KiCad 10.0.0. Functionality and appearance may be different in other versions of KiCad.

Documentation revision: `90e4b228`.

Введение

KiCad - это комплекс программного обеспечения с открытым исходным кодом для проектирования электрических схем и печатных плат. KiCad поддерживает как интегрированный процесс проектирования, при котором схема и печатная плата разрабатываются одновременно, так и их редактирование по отдельности для особых случаев. KiCad также содержит несколько инструментов для упрощения разработки схем и печатных плат, таких как PCB калькулятор для определения электрических свойств элементов схемы, просмотрщик Gerber для исследования файлов для производства печатных плат, а также интегрированный SPICE-симулятор для исследования работы схемы.

KiCad работает на всех основных операционных системах и на компьютерах самой разной конфигурации. Он поддерживает печатные платы с количеством слоёв меди до 32 и может использоваться в проектах любой сложности. KiCad разрабатывается командой энтузиастов из программистов и инженеров со всего света, цель которых - создание свободного программного обеспечения с отрытым исходным кодом применимого для профессиональной разработки.

Последняя версия документации KiCad доступна по адресу http://docs.kicad.org

Системные требования

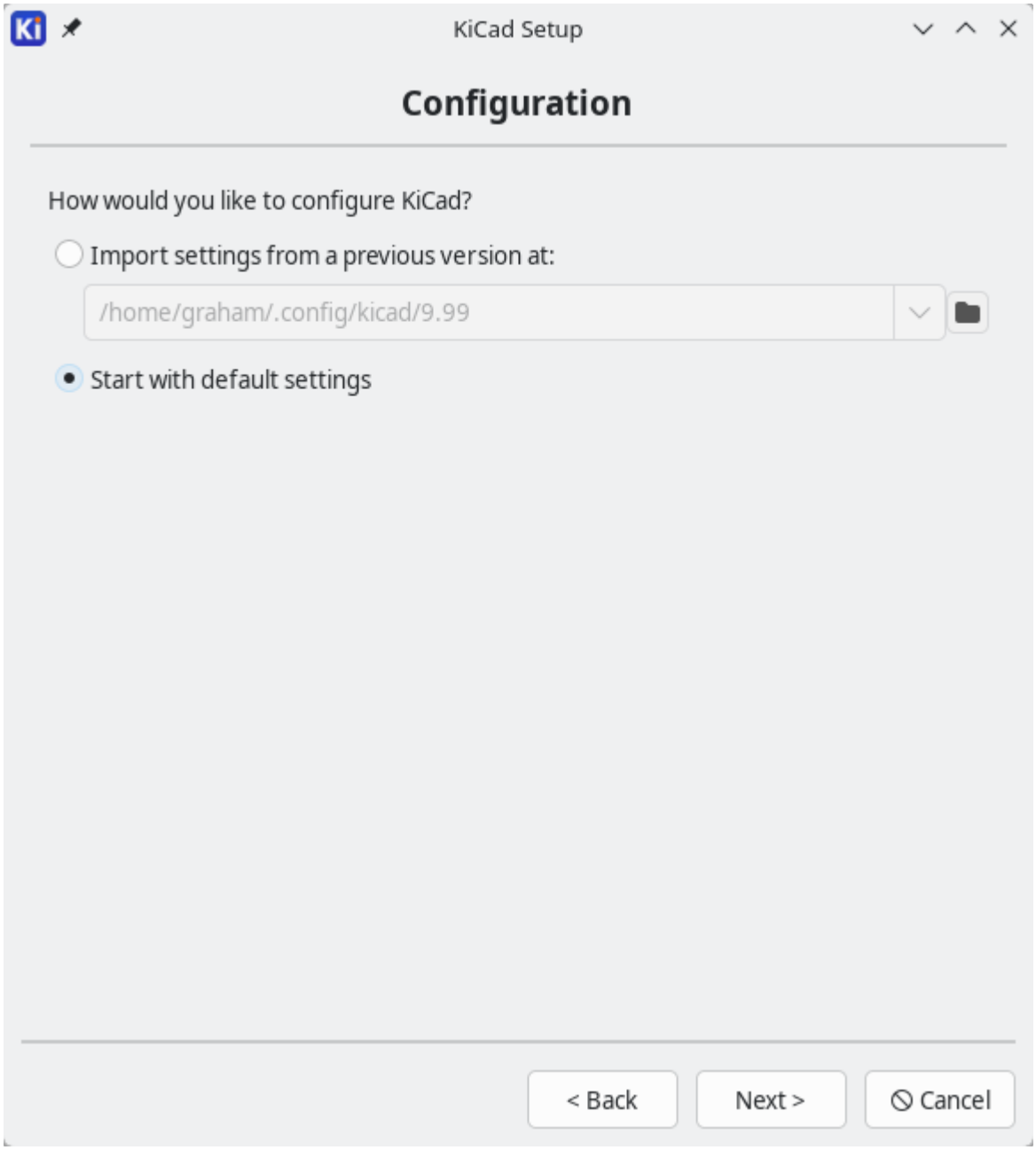
KiCad может использоваться на разнообразном оборудовании и разных операционных системах, но некоторые задачи могут выполняться медленнее или проблематичнее на слабом оборудовании. Для наилучшего удобства, рекомендуется использовать выделенный графический адаптер и монитор с разрешением 1920x1080 или выше.

Системные требования последней версии KiCad можно узнать на вэб-сайте: https://kicad.org/help/system-requirements/

Установка и обновление KiCad

First time setup

The first time you run a new major version of KiCad, a Welcome window will appear to ask you how to initialize your settings. Each major release of KiCad has its own configuration, so that you may run multiple KiCad versions on the same computer without the configurations interfering.



Configuration setup

You always have the option to start with default settings for the new version. If a previous version of KiCad is detected, you will have the option to import the settings from that version. The location of the previous configuration files is detected automatically, but you may override it to choose another location if desired.

NOTE	Hotkey configurations are not imported from previous versions. You can manually import hotkey configurations by using the **Import Hotkeys...** button on the **Hotkeys** page of Preferences, then browsing to the `.hotkeys` file from the old version's configuration directory. If you do so, please note that this will replace the current version's hotkey settings.

KiCad stores the settings files in a folder inside your user directory. Each KiCad version will use a different versioned subfolder. For KiCad 10, those folders are:

Windows	`%APPDATA%\kicad\10.0`
Linux	`~/.config/kicad/10.0`
macOS	`/Users/<username>/Library/Preferences/kicad/10.0`

Libraries setup

You also have options for how to initialize your symbol, footprint, and design block libraries. In most cases, you should choose the default option, **Start with the built-in KiCad libraries (recommended)**. This initializes your library tables to include all of the libraries that come with KiCad.

The other options are to import your library table setup from the previously installed KiCad version, or to start with no libraries and do all of the configuration yourself. Refer to the Schematic Editor and PCB Editor documentation for details on how to manually configure libraries.

Depending on your system and how KiCad was installed, some options may not be available. KiCad may also not be able to locate any libraries installed on your system. In this case, you should ensure you have installed the libraries, or you can manually configure the libraries after completing setup.

NOTE	On some systems the KiCad libraries are installed as a separate package.

The location of the default library table files depends on operating system and may vary based on installation location. Below are the defaults for each operating system:

Windows	`C:\Program Files\KiCad\10.0\share\kicad\template\`
Linux	`/usr/share/kicad/template/`
macOS	`/Applications/KiCad/KiCad.app/Contents/SharedSupport/template/`

Updates & Privacy setup

You can also choose whether to be notified about updates to the KiCad application and to third party packages you may have installed through KiCad's Plugin and Content Manager (plugins, themes, libraries, etc.). On Windows, you also have the option to enable anonymous crash reporting, which helps the KiCad team diagnose and fix critical issues in the application.

Migrating design files from previous versions

Последние версии KiCad могут открывать файлы созданные в предыдущих версиях, но сохраняют только в новейшем формате. В целом, это означает, что не нужно выполнять никаких особых

действий при переходе от старой версии файлов, достаточно просто их открыть. В некоторых случаях, при переходе от одной версии KiCad к другой могут изменяться расширения файлов. После загрузке таких файлов они будут сохранены в новом формате с новым расширением. Старые файлы автоматически не удаляются.

The schematic editor documentation describes several particular considerations for opening legacy schematics.

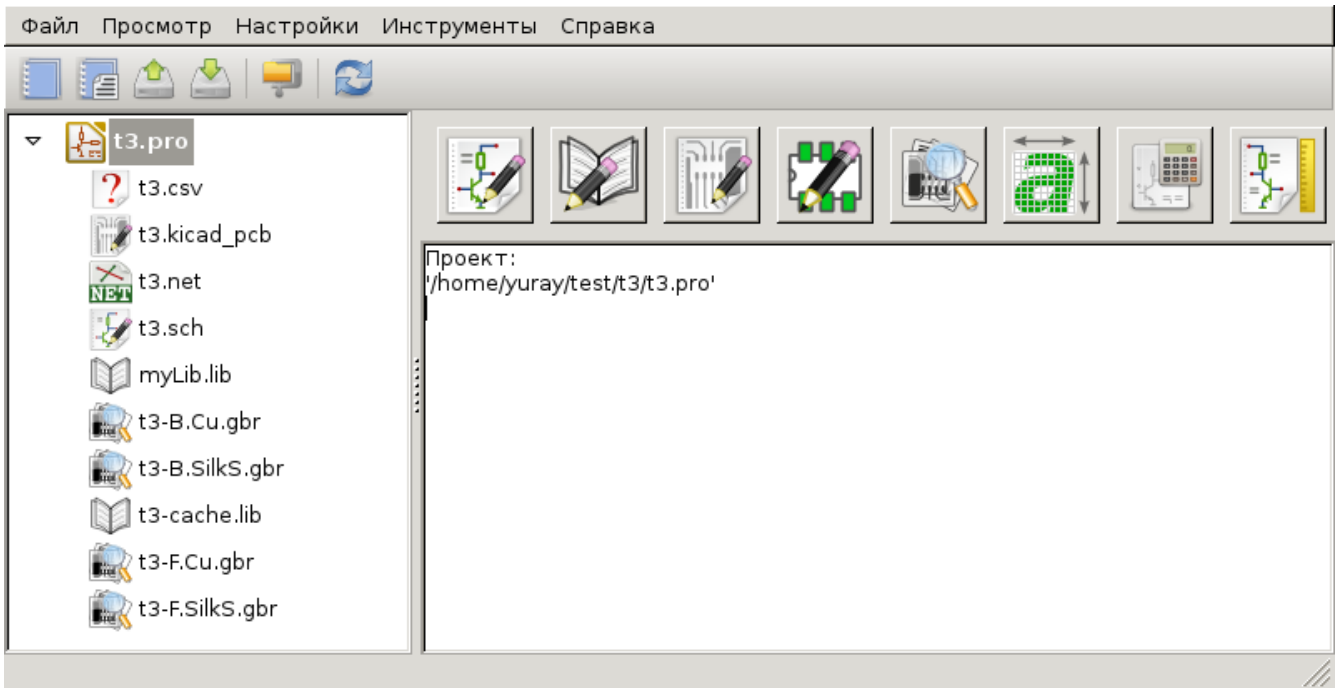
В общем, файлы созданные или изменённые одной версией KiCad **не могут** открываться более ранними версиями. По этой причине важно сохранять резервные копии своих проектов при тестировании новых версий KiCad, пока не убедитесь, что больше не нуждаетесь в старой версии KiCad.

Using the KiCad project manager

The KiCad project manager is the window that opens when you start KiCad. The project manager creates and opens KiCad projects and launches the other KiCad tools:

- the Schematic Editor
- the Symbol Editor
- the PCB Editor
- the Footprint Editor
- the Gerber Viewer
- the Image Converter
- the Calculator Tools
- the Drawing Sheet Editor
- the Plugin and Content Manager

Окно менеджера проектов KiCad состоит из дерева проекта слева, отображающего файлы связанные с открытым проектом, и панели запуска приложений справа, содержащей кнопки различных редакторов и инструментов.

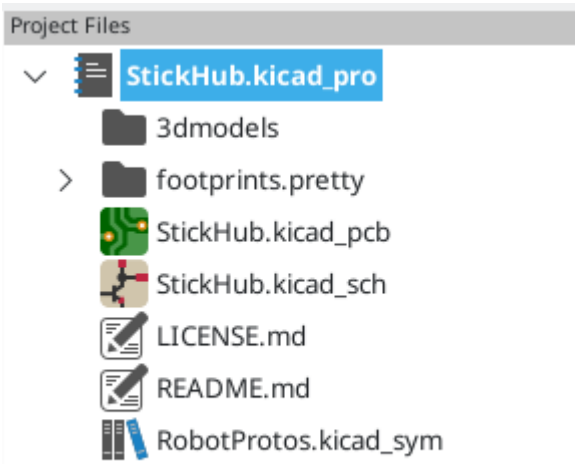


The tree view shows a list of the files inside the project folder. This includes the KiCad schematic and board design files as well as other files and folders in the project folder. If the project contains multiple schematic sheets, only the root sheet is shown in the tree view.

NOTE	В дереве проекта видны только те файлы, которые KiCad знает как отрыть и показать.

Double-clicking on a file in the tree view will open it in the associated editor. Right-clicking on a file will open a context menu with some file manipulation commands.

If the project is part of a Git repository, the tree shows icons indicating the version control status of each file and lists the active branch next to the project name. While normally the tree view only shows the schematic root sheet, and not any subsheets, all sheets are shown when the project is in a Git repository so that modifications to each sheet can be observed individually.



KiCad projects contain at least a project file, a schematic, and a board design. Schematics may contain multiple sheets, each in its own file, but a project can only contain a single board. KiCad expects the project file, schematic root sheet file, and board file to all have the same name.

Панель инструментов с левой стороны окна предоставляет доступ к основным командам управления проектом:

	Create a new project.
	Open an existing project.
	Create a zip archive of the whole project. This includes schematic files, libraries, PCB, etc.
	Extract a project zip archive into a directory. Files in the destination directory will be overwritten.
	Refresh the tree view, to detect changes made on the filesystem.
	Open the project working directory in a file explorer.

Standalone mode

You can also run the KiCad editor tools in *standalone* mode, by launching them directly from your operating system's application launcher rather than from the project manager. It is usually **not recommended** to run the tools in standalone mode, except for some specific situations where it is necessary, such as when importing projects from other EDA tools. When running in standalone mode, some project features are not available, including:

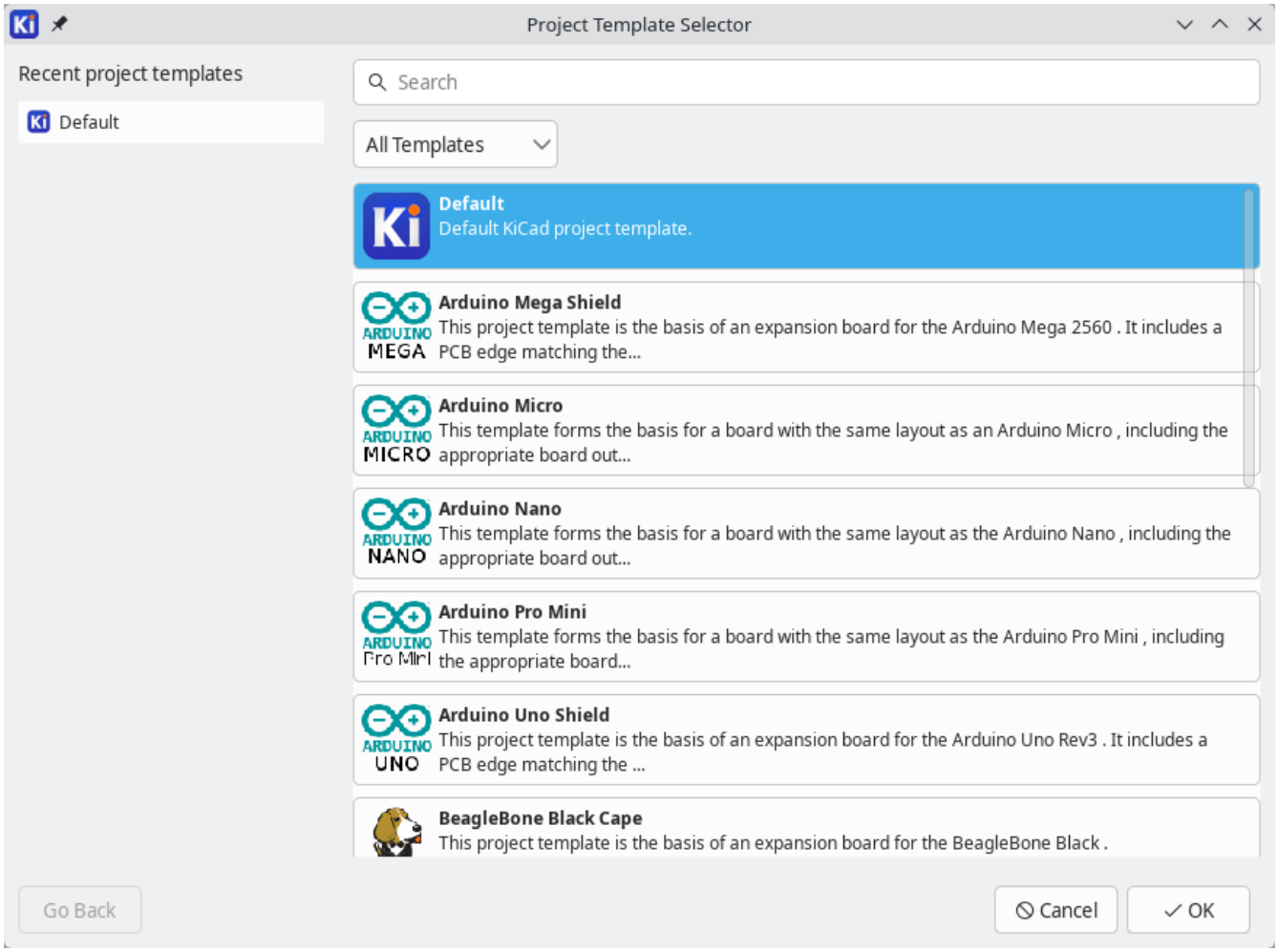
cross probing between the schematic editor and the board editor

- design synchronization between the schematic and the board

Создание нового проекта

Most KiCad designs start with the creation of a project. When you create a new project, you always begin by choosing a project template, even if that template is the default, blank project template.

To create a new project, use the **New Project...** command in the **File** menu, click the **New Project** button in the top toolbar, or use the keyboard shortcut (`Ctrl` + `N` by default).



The right side of this dialog shows a list of all installed project templates. The **Default** template is always available for you to create an empty project. Clicking one of these templates will show the template's description in a new panel. The left side of the dialog shows a list of your recently used project templates.

NOTE	Creating new project templates is covered in the Project Templates section.
TIP	Creating your own project templates is a good way to easily create new projects that are preconfigured with your preferred drawing sheets, design rules, PCB outlines, logos, etc.

When you have chosen a template, click the **OK** button to create a new project from that template.

Будет запрошено имя проекта. По умолчанию, создаётся каталог для проекта с таким же именем. Например, если указать имя проекта `MyPorject`, KiCad создаст каталог `MyProject` и файл проекта

`MyProject/MyProject.kicad_pro` внутри.

If you already have a directory to store your project files in, you can uncheck the **Create a new directory for the project** checkbox in the New Project dialog.

NOTE	Настоятельно рекомендуется хранить каждый проект в собственном каталоге.

Как только имя проекта будет задано, KiCad создаст следующие файлы внутри каталога проекта:

`example.kicad_pro`	KiCad project file.
`example.kicad_sch`	Main schematic file.
`example.kicad_pcb`	Printed circuit board file.

Other files may also be created, depending on the contents of the template.

Импорт проекта из другой САПР

KiCad is able to import files created by some other software packages. Some software formats can be imported as complete projects. Others can only be imported as standalone schematics or boards, and must be manually linked together into a KiCad project. The following types of projects are supported:

Source EDA Tool	**File Extension(s)**
Altium Designer	`.PrjPcb`
CADSTAR archive format	`.csa`, `.cpa`
Eagle 6.x or newer (XML format)	`.sch`, `.brd`
EasyEDA (JLCEDA) Standard Backup	`.zip`
EasyEDA (JLCEDA) Pro Project	`.epro`, `.zip`
PADS ASCII Project	`.asc`, `.txt`
gEDA / Lepton EDA Project	`.prj`, `.sch`, `.pcb`

Чтобы импортировать проект одной из этих САПР, выберите соответствующую команду из подменю **Импорт проекта из другой САПР...**, меню **Файл**.

Depending on the format, you will be prompted to select either a project, schematic, or a board file in the import file browser dialog. The imported schematic and board files should have the same base file name (e.g. project.sch and project.brd). Once the requested files are selected, you will be asked to select a directory to store the resulting KiCad project.

A greater number of formats can be imported as either schematics or boards, rather than complete projects. The following schematic formats can be imported into the Schematic Editor:

Source EDA Tool	File Extension(s)
Altium Designer	`.SchDoc`
Eagle (Autodesk)	`.sch` (XML)
LTspice	`.asc`
PADS Logic	`.asc`, `.txt`
CADSTAR Schematic Archive	`.csa`
gEDA / Lepton EDA	`.sch`
EasyEDA (JLCEDA) Standard	`.json`
EasyEDA (JLCEDA) Professional	`.epro`, `.zip`

Importing these schematic formats is explained in more detail in the Schematic Editor documentation.

The following PCB formats can be imported into the PCB Editor:

Source EDA Tool	File Extension(s)
Altium Designer	`.PcbDoc`
Altium Circuit Maker	`.CMPcbDoc`
Altium Circuit Studio	`.CSPcbDoc`
Cadence Allegro	`.brd`
CADSTAR PCB Archive	`.cpa`
Eagle (Autodesk)	`.brd` (XML)
EasyEDA / JLCEDA Standard	`.json`, `.zip`
EasyEDA / JLCEDA Professional	`.epro`, `.zip`
Fabmaster	`.txt`, `.fab`
gEDA / Lepton EDA	`.pcb`
P-CAD 200x	`.pcb` (ASCII)
PADS (ASCII)	`.asc`
Solidworks PCB	`.SWPcbDoc`

Importing these PCB formats is explained in more detail in the PCB Editor documentation.

Saving and loading project archives

You can archive your project's files into a zip archive with the Archive tool (**File → Archive Project...**).

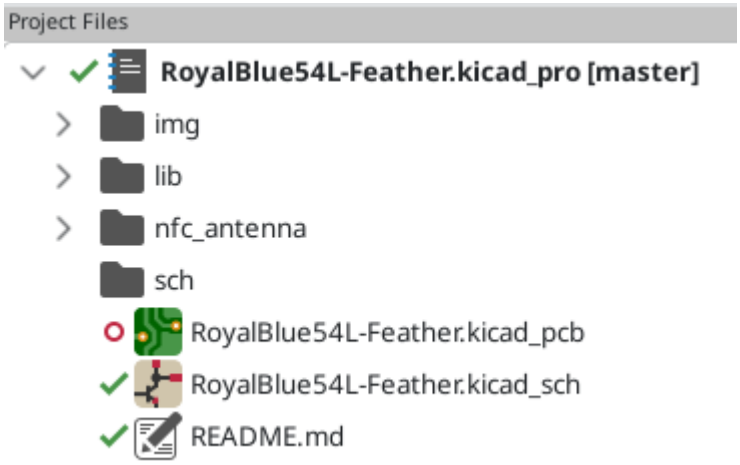
You can also unarchive a project using the Unarchive tool (**File → Unarchive Project...**). When you unarchive a project into the currently loaded project directory, the project will be reloaded automatically to reflect any changes that were in the archived version of the project.

The archive tool saves the following files from your project folder into the archive:

`*.kicad_prl`, `*.kicad_pro`, `*.kicad_sch`, `*.kicad_sym`, `*.kicad_pcb`, `*.kicad_mod`, `*.kicad_dru`, `*.kicad_wks`, `*.kicad_jobset`, `*.wbk`, `*.json`, `fp-lib-table`, `sym-lib-table`, `design-block-lib-table`	KiCad design files
`*.pro`, `*.sch`, `*.lib`, `*.dcm`, `*.cmp`, `*.brd`, `*.mod`	Legacy KiCad design files
`*.stp`, `*.step`	3D models
`*.g?`, `*.g??`, `*.gm??`, `*.gbrjob`	Gerber files
`*.pos`, `*.drl`, `*.nc`, `*.xnc`, `*.d356`, `*.rpt`	Manufacturing files
`*.net`	Netlists
`*.py`	Python scripts
`*.pdf`, `*.txt`	Documentation files
`*.cir`, `*.sub`, `*.model`	SPICE models
`*.ibs`, `*.pkg`	IBIS models

Git integration

The KiCad Project Manager integrates with the Git version control tool for tracking changes in your projects. It can work with an existing local Git repository, clone a project from a remote repository, or create a new repository in an existing project. You can use the tool to commit changes from your project, push and pull from a remote repository, and switch branches.



If you open a project that is already under version control with Git, i.e. it is part of an existing Git repository, you can use KiCad's version control features to track changes in the project without any additional configuration. The active branch is displayed next to the project name, and the version control status of each file in your project is shown graphically in the project files tree. For example, the ✓ icon indicates a file is unchanged, ○ indicates a file has uncommitted changes, and + indicates a file is not tracked. No icons are shown if the project is not part of a Git repository.

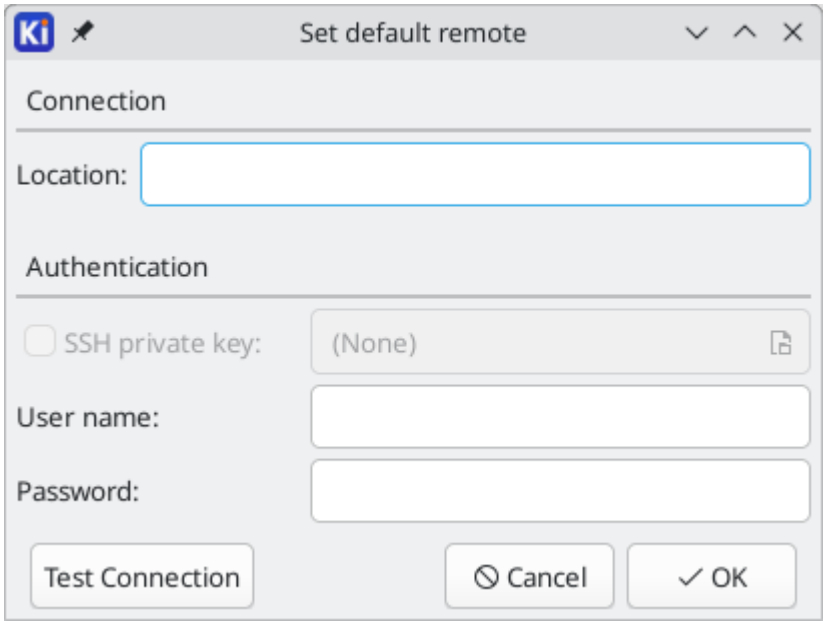
NOTE	You can disable KiCad's Git integration features in the **Version Control** page of the Preferences dialog. The preferences also let you configure the remote update interval and the default commit author information.

Adding version control to an existing project

If an existing project is not already under version control, you can initialize a new Git repository in the project by right clicking on one of the files in the project files tree and clicking **Version Control → Add Project to Version Control...**. You must configure a remote when initializing a repository in this way. Configuring the repository requires the following information:

- **Location**: The URL or file path to the remote. HTTPS, SSH, and local (file) connections are supported. The format of the URL is used to automatically determine the type of connection and set the authentication options accordingly.
- **SSH private key**: The SSH private keyfile to use for authentication (SSH connections only).
- **User name**: The user name to use for authentication. For SSH connections, the user name is often `git`.
- **Password**: The password to use for authentication (HTTPS connections only).
- **SSH key password**: The passphrase for your SSH key, if you have configured one (SSH connections only).

You can check the connection and authentication by clicking the **Test Connection** button.

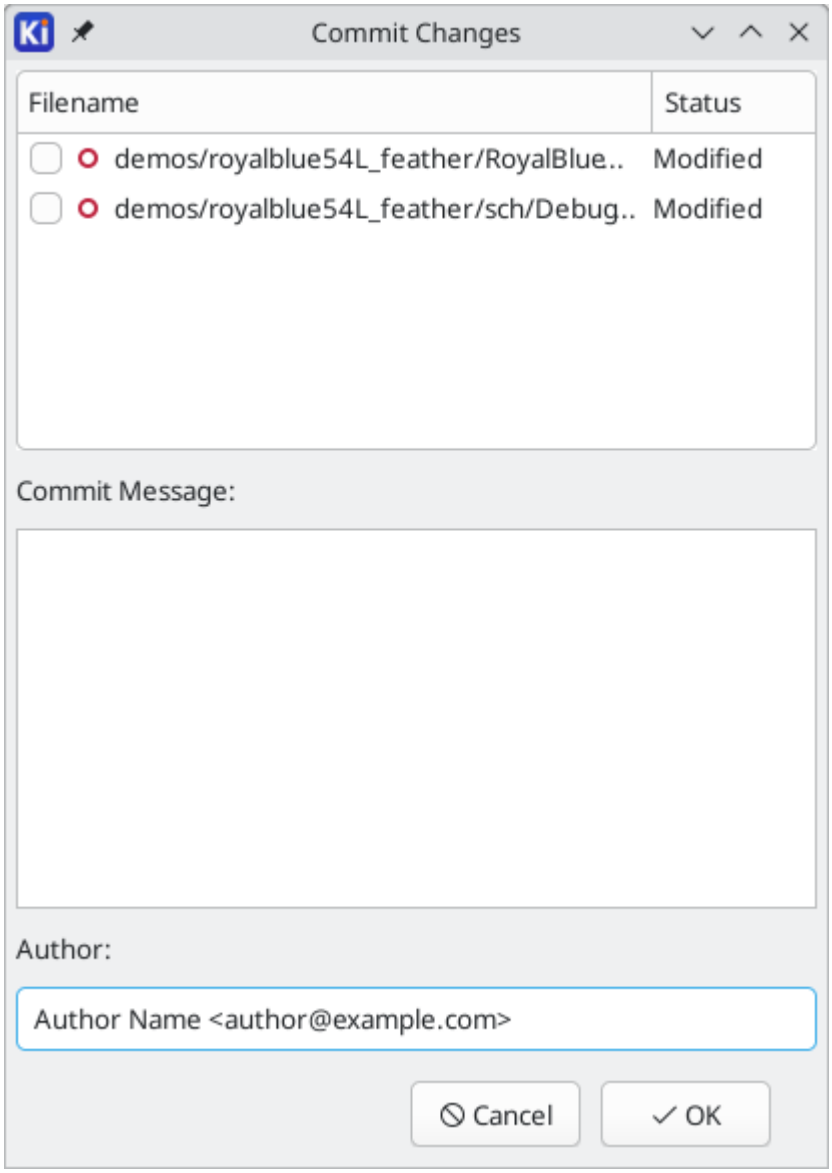


Cloning an existing repository

To clone an existing repository and open the cloned project, use **File → Clone Project from Repository...**. You can clone a remote repository using SSH or HTTPS, or clone a local repository. The configuration settings for cloning are the same as the settings for configuring a new repository and remote for an existing project.

Tracking project changes with Git

When you have made changes that you want to commit, you can commit either the entire project (right click → **Version Control → Commit Project...**) or a specific file (right click the file → **Version Control → Commit File...**). Both actions open the Commit Changes dialog, but the Commit Project action shows all changed files in the repository, while the Commit File action shows only the file that was right clicked. The Commit Changes dialog lets you select the changed files you want to include in the commit, provide a commit message and author, and commit the changes.



To push changes to the remote, right click in the project files tree and select **Version Control → Push**. To pull from the remote, right click and select **Version Control → Pull**. You can switch branches by selecting the desired branch from the **Version Control → Switch to Branch** menu.

Finally, you can disable version control tracking for the project by right clicking and selecting **Version Control → Disable Git Integration**. This disables KiCad's Git integration when editing the current project, but it does not remove the project's Git history or otherwise affect the actual Git repository on disk, so you can continue to version control the project with another Git tool. It also does not disable KiCad's Git integration with other projects. You can disable the Git integration for all projects in the **Version Control** page of the Preferences dialog.

Файлы и каталоги KiCad

При работе над схемой и платой KiCad создаёт и использует файлы со следующими расширениями файлов (и каталогов):

Many of these files include important design information, especially the project file (`.kicad_pro`), the schematic file(s) (`.kicad_sch`), and the board file (`.kicad_pcb`). Other files may also be necessary. Such files should always be included when distributing the project. Some files are not necessary to distribute with the project, such as the project-local settings file (`.kicad_prl`) or the `fp-info-cache` file. Files that are unnecessary to distribute are noted in the table below.

Project files

`.kicad_pro`	Project file, containing settings that are shared between the schematic and PCB
`.pro`	Legacy (KiCad 5.x and earlier) project file. Can be read and will be converted to a `.kicad_pro` file by the project manager.

Schematic editor files and folders

`.kicad_sch`	Schematic files, containing all symbol and connection information.
`.kicad_sym`	Schematic symbol library file, containing the symbol descriptions: graphic shape, pins, fields. This is a *packed* library, i.e. all of the symbols in the library are in a single file. This can also be an individual symbol in an *unpacked* library, where the library is a folder containing individual `.kicad_sym` files, and each file is a separate symbol. Unpacked library folders do not have a required extension, but `.kicad_symdir` is a common convention.
`.kicad_symdir`	Schematic symbol library folder. The folder itself is the library, and contains individual `.kicad_sym` symbol files. This is an *unpacked* alternative to a `.kicad_sym` *packed* library, where the library is contained in a single file. Note that `.kicad_symdir` is a convention for unpacked symbol libraries but is not required; any folder name can be used.
`.wbk`	Simulator workbook file containing SPICE simulation setup information.
`.sch`	Legacy (KiCad 5.x and earlier) schematic file. Can be read and will be converted to a `.kicad_sch` file on write.
`.lib`	Legacy (KiCad 5.x and earlier) schematic library file. Can be read but not written.
`.dcm`	Legacy (KiCad 5.x and earlier) schematic library documentation. Can be read but not written.
`*-cache.lib`	Legacy (KiCad 5.x and earlier) schematic component library cache file. Required for proper loading of a legacy schematic (`.sch`) file.
`sym-lib-table`	Symbol library table: list of symbol libraries available in the schematic editor.
`design-block-lib-table`	Design block library table: list of design block libraries available in the schematic editor.

Board editor files and folders

`.kicad_pcb`	Board file containing all info but the page layout.
`.pretty`	Footprint library folders. The folder itself is the library.
`.kicad_mod`	Footprint files, containing one footprint description each.
`.kicad_dru`	Design rules file, containing custom design rules for a certain `.kicad_pcb` file.
`.brd`	Legacy (KiCad 4.x and earlier) board file. Can be read, but not written, by the current board editor.
`.mod`	Legacy (KiCad 4.x and earlier) footprint library file. Can be read by the footprint or the board editor, but not written.
`fp-lib-table`	Footprint library table: list of footprint libraries available in the board editor.
`fp-info-cache`	Cache to speed up loading of footprint libraries. Does not need to be distributed with the project or put under version control.

Common files

`.kicad_prl`	Local settings for the current project; helps KiCad remember the last used settings such as layer visibility or selection filter. Does not need to be distributed with the project or put under version control.
`.kicad_wks`	Page layout (drawing border and title block) description file.
`.kicad_jobset`	Jobset definition file containing output jobsets.
`.kicad_blocks`	Design block library folders. The folder itself is the library. Design blocks can contain both schematic and layout fragments.
`.kicad_block`	Design block folder for defining a reusable design. The folder is the design block, and contains a `.kicad_sch` file defining the design block's schematic, a `.kicad_pcb` file defining the design block's layout, and a `.json` file defining the design block's metadata.
`.net`	Netlist file created from the schematic, and read by the board editor. Note that the recommended workflow for transferring information from the schematic to the board does not require the use of netlist files.
`.cmp`	Association between components used in the schematic and their footprints. It can be created by the Board Editor and imported by the Schematic Editor. Its purpose is to import changes from the board to the schematic, for users who change footprints in the Board Editor (for instance using **Exchange Footprints** command) and want to import these changes back to the schematic. Note that the recommended workflow for transferring information from the board to the schematic does not require the use of `.cmp` files.

Fabrication and documentation files

`.gbr`	Gerber files, for fabrication.
`.drl`	Drill files (Excellon format), for fabrication.
`.pos`	Position files (ASCII format), for automatic insertion machines.
`.rpt`	Report files (ASCII format), for documentation.
`.ps`	Plot files (Postscript), for documentation.
`.pdf`	Plot files (PDF format), for documentation.
`.svg`	Plot files (SVG format), for documentation.
`.dxf`	Plot files (DXF format), for documentation.

Storing and sending KiCad files

KiCad schematic and board files contain all the schematic symbols and footprints used in the design, so you can back up or send these files by themselves with no issue. Some important design information is stored in the project file (`.kicad_pro`), so if you are sending a complete design, make sure to include it.

Some files, such as the project-local settings file (`.kicad_prl`) and the `fp-info-cache` file, are not necessary to send with your project. If you use a version control system such as Git to keep track of your KiCad projects, you can add these files to the list of ignored files so that they are not tracked.

Paths and libraries configuration

In KiCad, one can define paths using a **path variable**. A few path variables are internally defined by KiCad, and can be used to define paths for libraries, 3D shapes, etc.

Это полезно, когда абсолютные пути неизвестны или меняются (например, при переносе проекта на другой ПК), а также, когда один общий каталог содержит множество подобных элементов. Рассмотрим следующие объекты, которые могут быть установлены в разных местах:

- Библиотеки символов схемы
- Библиотеки посадочных мест
- 3D model files used in footprint definitions

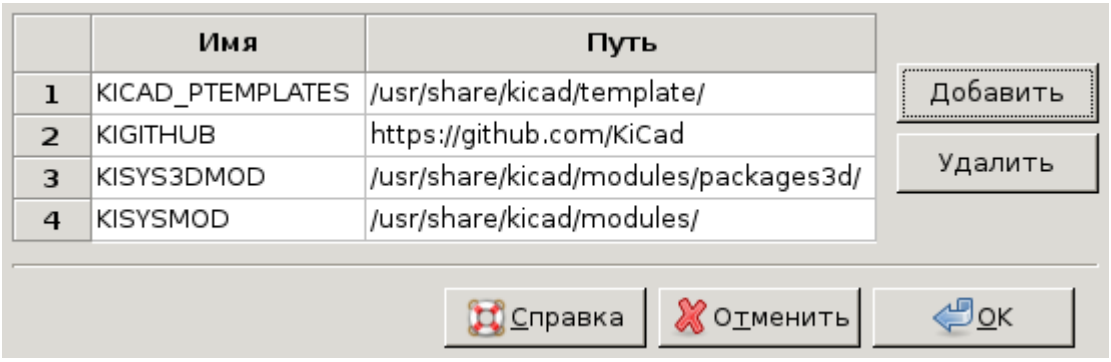
For instance, the path to the `connect.pretty` footprint library, when using the `KICAD10_FOOTPRINT_DIR` path variable, would be defined as `${KICAD10_FOOTPRINT_DIR}/connect.pretty`.

The **Preferences → Configure Paths...** menu allows you to define paths for some built-in KiCad path variables, and add your own path variables to define personal paths, if needed.

NOTE	KiCad will automatically resolve versioned path variables from older versions of KiCad to the value of the corresponding variable from the current KiCad version, as long as the old variable is not explicitly defined itself. For example, `${KICAD9_FOOTPRINT_DIR}` will automatically resolve to the value of `${KICAD10_FOOTPRINT_DIR}` if there is no `KICAD9_FOOTPRINT_DIR` variable defined.

KiCad path variables

`KICAD10_3DMODEL_DIR`	Base path of KiCad's standard 3D footprint model library files.
`KICAD10_3RD_PARTY`	Location for plugins, libraries, and color themes installed by the Plugin and Content Manager.
`KICAD10_FOOTPRINT_DIR`	Base path of KiCad's standard footprint library files.
`KICAD10_SYMBOL_DIR`	Base path of KiCad's standard symbol library files.
`KICAD10_TEMPLATE_DIR`	Location of KiCad's standard project template library files.
`KICAD_USER_TEMPLATE_DIR`	Location of personal project templates.
`SPICE_LIB_DIR`	Location of personal simulation model libraries. This variable is not defined by default.
`KIPRJMOD`	Absolute path to the current project directory. This variable is set automatically and cannot be redefined.



Paths set in the Configure Paths dialog are internal to KiCad and are not visible as environment variables outside of KiCad. They are stored in KiCad's user configuration files.

Paths can also be set as system environment variables outside of KiCad, which will override any settings in the user's configuration.

NOTE You cannot override a system environment variable that has been set outside of KiCad by using the Configure Paths dialog. Any variable that has been set externally will be shown as read-only in the dialog.

Note also that the path variable `KIPRJMOD` is **always** internally defined by KiCad, and expands to the **current project absolute path**. For instance, `${KIPRJMOD}/connect.pretty` is always the `connect.pretty` folder (the footprint library) inside **the current project folder**. The `KIPRJMOD` variable cannot be changed in the Configure Paths dialog or overridden by an external environment variable.

Advanced environment variables

Some advanced environment variables can be set to customize where KiCad expects certain files to be located. By default, these locations are set based on your platform, but they can be overridden by system environment variables. These variables are not shown in the Configure Paths dialog and cannot be used in path substitutions.

Changing these variables will not result in KiCad moving any files from the default location to the new location, so if you change these variables you will need to copy any desired settings or files manually.

`KICAD_CONFIG_HOME`	Base path of KiCad configuration files. Subdirectories will be created within this directory for each KiCad minor version.
`KICAD_DOCUMENTS_HOME`	Base path of KiCad user-modifiable documents, such as projects, templates, Python scripts, libraries, etc. Subdirectories will be created within this directory for each KiCad minor version. This directory is provided as a suggested user data location, but does not need to be used.
`KICAD_STOCK_DATA_HOME`	Base path of KiCad stock data, including default libraries. The data in this directory is managed by the KiCad installer or system package manager, and is not intended for user-writeable data.

WARNING If you modify the configuration of paths, please quit and restart KiCad to avoid any issues in path handling.

Настройка библиотек

The **Preferences → Manage Symbol Libraries...** menu lets you manage the list of symbol libraries (symbol library table).

Likewise, use the **Preferences → Manage Footprint Libraries...** menu to manage the list of footprint libraries (footprint library table).

For each type of library (symbol and footprint), there are 2 library tables: global and project specific. The global library table is located in the user configuration directory and contains a list of libraries available to all projects. The project-specific library table is optional and contains a list of libraries specific to the project. It is located in the project directory.

Jobsets

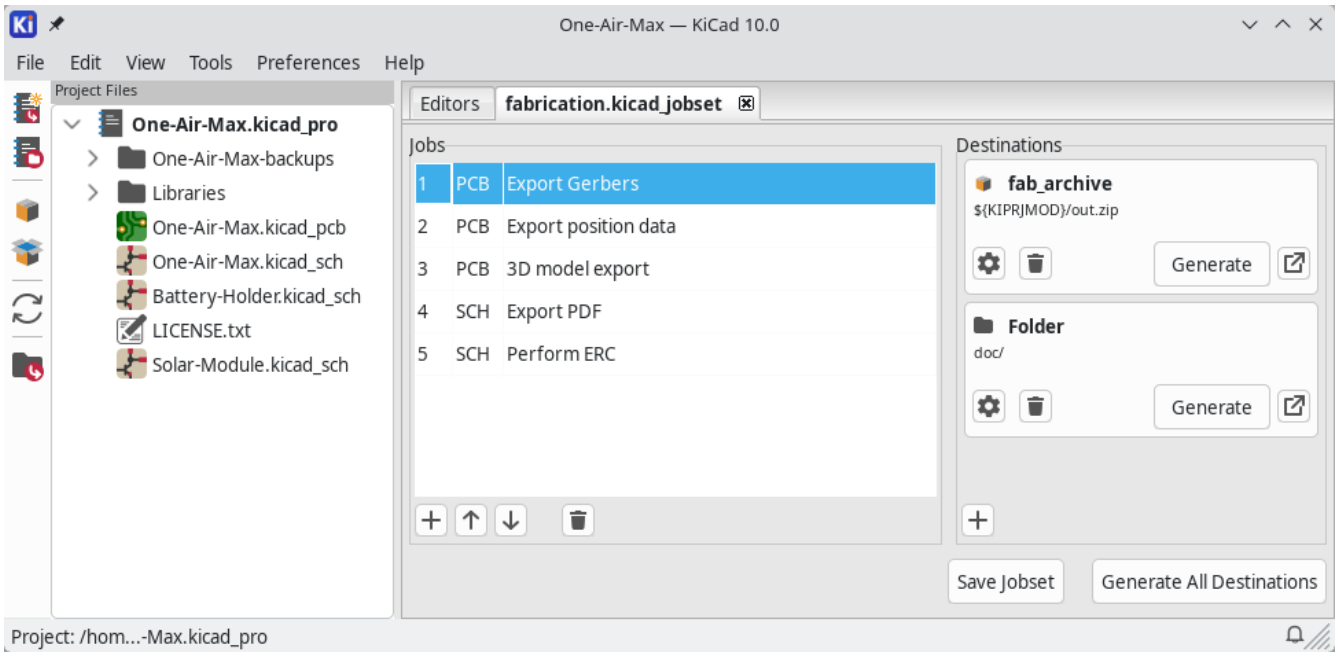
KiCad lets you configure a list of outputs that are all generated with a single click. The list of output jobs and the destinations where they will be saved is called a *jobset*. For example, a jobset might contain jobs to generate Gerber files, assembly data, a bill of materials, PDF plots of the schematic and PCB, while also running ERC and DRC checks, with all of the outputs saved to a compressed archive. The full list of available jobs is given below.

Each *job* in a jobset defines a single type of generated output, such as a bill of materials or a set of Gerbers. A job can be configured in the same way as if the output was manually generated from the schematic or board editor. The configuration for each job is stored in the jobset and remembered when you load the jobset later. Jobs are configured individually, so if you include the same type of job multiple times in a single jobset, each job will have its own independent configuration. For example, this lets you generate PDF outputs in color as well as black and white.

In addition to the jobs, jobsets also contain *destinations*, which define a list of jobs to run and how to store their outputs. A jobset destination can simply store the chosen jobs' output files in a specified location, or it can add the output files to a compressed archive. Each jobset destination can select a different subset of jobs from the full list of jobs in the jobset. You can run each jobset destination individually or run all jobset destinations at once. As an example, you could set up one jobset destination that generates PDFs of the board and schematic and copies them to an external location, while another destination generates the fabrication files and compresses them in a zip archive to send to the board manufacturer.

Projects can have multiple jobsets, with each jobset defining a different list of jobs and output configurations. Each jobset is stored in a `.kicad_jobset` file, which can be specific to a single project, copied between projects, or even stored in a central location and shared between projects.

To use a jobset, first create a new jobset file in the KiCad project manager (**File → New Jobset File...**) and choose a name and location for it. Alternatively, you can open an existing jobset file with **File → Open Jobset File...**. Jobset files that are stored in the project directory are considered part of the project and are displayed in the project file tree. You can open a jobset file in the project file tree by double clicking on it.



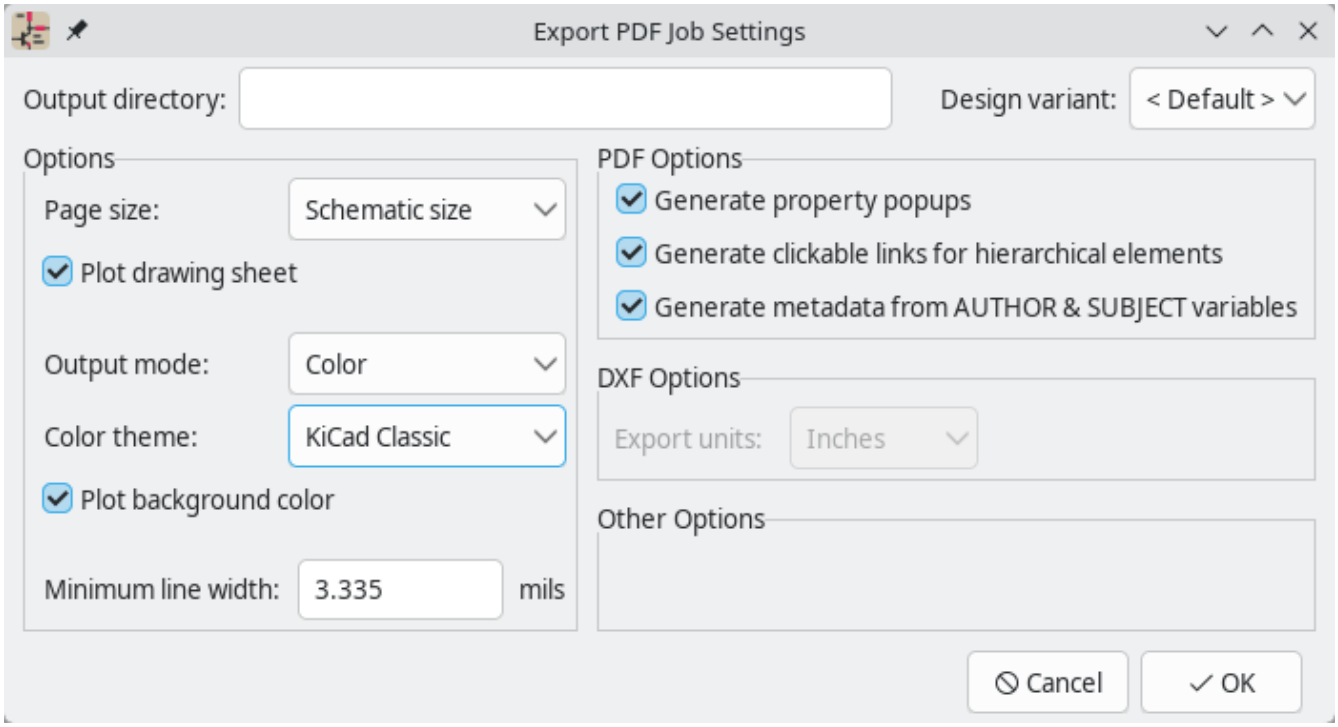
Once you create or open a jobset, it is displayed in a new tab in the project manager. The list of jobs is shown in the middle and the list of jobset destinations is shown on the right. New jobsets will not contain any jobs, but a destination is automatically created to save outputs to a folder. When you make changes to a jobset, you can save the changes by clicking the **Save Jobset** button.

Defining jobs

To add a new job, click the + button under the Jobs list. In the Add New Job dialog that appears, select the desired type of job. You can filter which types of jobs are shown in the list by typing in the **Filter** textbox at the bottom.

When you select a job and press **OK**, the settings dialog for that type of output will appear. Each job settings dialog provides the same options you would have if you manually generated that type of output from the schematic or board editor.

NOTE	Output filenames and paths specified in job settings are relative to the jobset destination folder or archive root. You can use certain text variables, like `${PROJECTNAME}`, `${CURRENT_DATE}`, and project text variables.



When you accept the job settings dialog, the job is added to the list of jobs, where you can optionally change the new job's description from its default. To change a job's description or settings later, right click the job in the list and select **Edit Job Description** or **Edit Job Settings...**. Double clicking on a job also edits its settings. To remove a job, select the job and click the 🗑 button. To reorder the list, select a job and move it up or down using the ↑ or ↓ buttons.

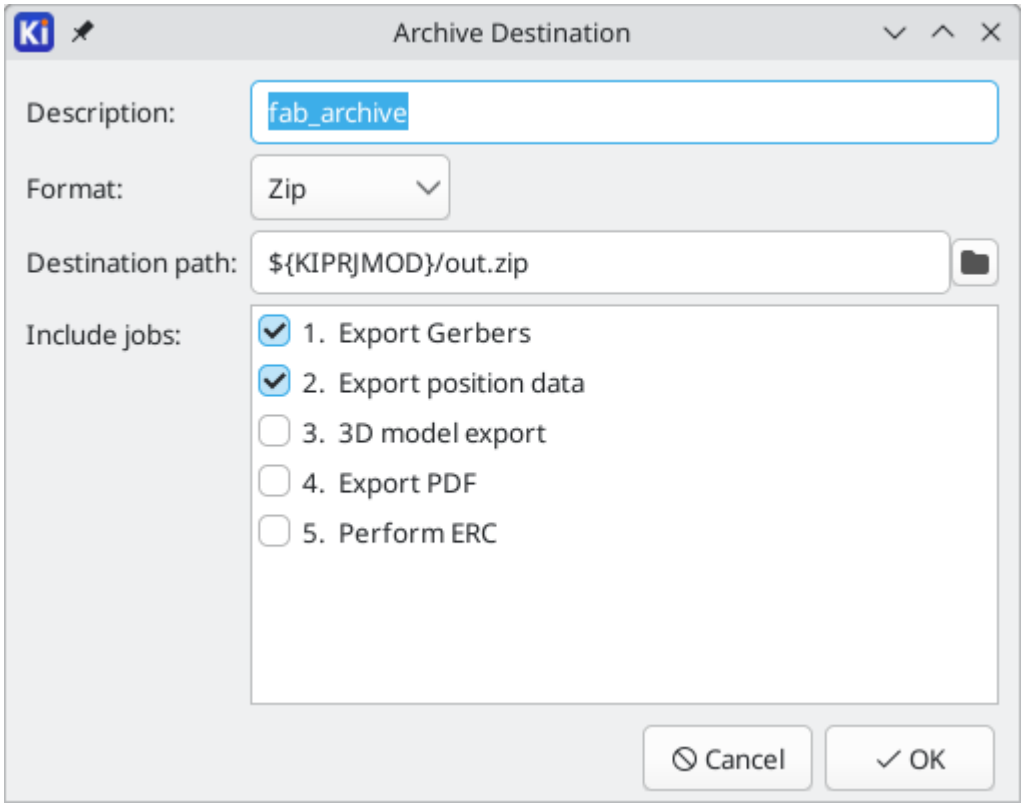
Defining jobset destinations

You cannot generate any outputs from a jobset until you add a jobset destination. One destination is created automatically when a jobset is created, but you can add as many destinations as you need.

To add a jobset destination, click the + button under the Destinations list. When the Add New Destination dialog appears, select a type of destination:

- **Archive** saves the outputs generated by the jobs in a compressed zip archive.
- **Folder** saves the outputs generated by the jobs uncompressed in a folder.

Once you have selected a type of output, the Destination options dialog appears.

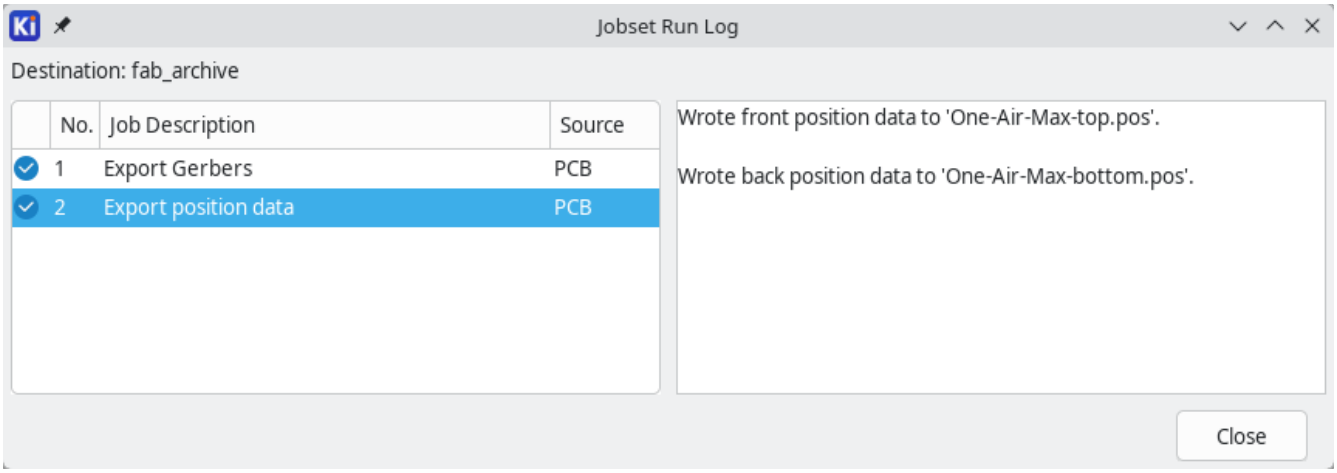


Here you can select which jobs will be run as part of this jobset destination, as well as the folder or archive name that will be used to store them. By default all jobs are enabled. You can also set a description for the destination to be displayed in the Destinations list. The output path controls where the files generated by the jobs will be saved. The path here can be absolute or relative to the project directory, and it can use path variables or certain text variables (`${PROJECTNAME}`, `${CURRENT_DATE}`, and project text variables). Filenames defined in job configurations are relative to the jobset destination directory or archive root.

When you click **OK** in this dialog, the new jobset destination is added to the Destinations list. You can modify an existing jobset destination by clicking its button, or remove it by clicking its button.

After configuring your jobs and destinations, you can generate an individual set of outputs by clicking the **Generate** button for the desired destination. You can run all destinations at once by clicking the **Generate All Destinations** button.

If a jobset destination runs and generates its outputs successfully, a blue check is shown that indicates the last run was successful. If a jobset destination fails to complete successfully, a red exclamation point is shown to indicate the run was not successful. Clicking on the success/failure indicator will display the Jobset Run Log dialog, which displays the status of each job in the jobset destination. Clicking on a specific job will display the logged output from that job, if there is any.



After a jobset destination runs successfully, you can click the destination's **Open Output** button to open a file browser in the destination location. This button is disabled if the jobset destination has not run or hasn't successfully finished.

Jobset destination details

When jobs run, output files are initially generated in a temporary folder. After all jobs in a jobset destination are completed, the output files are moved from the temporary folder to the folder or archive specified by the jobset destination. None of the outputs are moved until all of the jobs finish. Therefore, if a job needs to access files that are generated by another job in the same jobset destination, these files will be located in the temporary folder, not the final jobset destination.

KiCad defines the `${JOBSET_OUTPUT_WORK_PATH}` environment variable while jobs are running and sets it to the temporary path for the current jobset destination. You can use this environment variable if a job needs to be aware of the temporary folder's actual location. For example, if an Execute Command job runs a script that renames the outputs of another job, the script needs to know the temporary location of the outputs being renamed, before they are moved to the jobset destination. `${JOBSET_OUTPUT_WORK_PATH}` provides this location.

Available job types

The following types of jobs are available:

Job	Description
PCB: Export 3D Model	Exports a 3D model of the board. The model format can be STEP, GLB (binary glTF), XAO, BREP (OCCT), PLY, STL, STPZ, U3D, or PDF.
PCB: Export Board Statistics	Generates a Board Statistics report in either JSON or text report format.
PCB: Export Drill Data	Exports a drill file from the board.
PCB: Export DXF	Exports the board design to a DXF file.
PCB: Export Gencad	Exports the board design in GenCAD format.
PCB: Export Gerbers	Exports the board design to Gerber files, with one file per selected layer.
PCB: Export IPC-2581	Exports the board design in IPC-2581 format.

PCB: Export ODB++	Exports the board design in ODB++ format.
PCB: Export PDF	Exports the board design to PDF files, with one file per selected board layer. You can also generate a single PDF with multiple layers depending on the plot configuration.
PCB: Export Position Data	Exports a position (component placement) file from the board.
PCB: Export PostScript	Exports the board design to a PostScript file.
PCB: Export SVG	Exports the board design to a SVG file.
PCB: Perform DRC	Performs a Design Rule Check on the board and generates a report. If DRC violations are found, this job can optionally report a job failure.
PCB: Render	Generates a raytraced rendering of the 3D model of the board as a PNG or JPG file.
Schematic: Export DXF	Exports the schematic to a DXF file.
Schematic: Export Netlist	Exports a netlist from the schematic, with various formats available.
Schematic: Export PDF	Exports the schematic to a PDF file.
Schematic: Export Postscript	Exports the schematic to a PostScript file.
Schematic: Export SVG	Exports the schematic to a SVG file.
Schematic: Generate Bill of Materials	Exports a bill of materials from the schematic.

Schematic: Perform ERC	Performs an Electrical Rule Check on the schematic and generates a report. If ERC violations are found, this job can optionally report a job failure.
Special: Copy Files	Copies the specified file to the specified location. A failure to copy the files can optionally cause the output job to fail. You can control whether files in the output location should be overwritten or not.
Special: Execute Command	Executes an arbitrary command. Output from the command can optionally be logged to a file. You can either ignore non-zero output codes or cause them to fail the output job. The command is executed in the platform's shell (`/bin/sh -c` on Linux and macOS, `cmd.exe \c` on Windows), so platform-shell-specific features can be used in the command, such as globbing and pipes. **Note:** Job output files are generated in a temporary folder, then moved to the location specified by the jobset destination after all jobs for that destination are executed. In other words, when an Execute Command job runs, the output from other jobs in the same jobset destination are still in a temporary location and not yet in the ultimate destination folder or archive. You can use the `${JOBSET_OUTPUT_WORK_PATH}` environment variable if you need to refer to the temporary location in an Execute Command job (for example, in a script that renames files generated by another job).

Шаблоны проектов

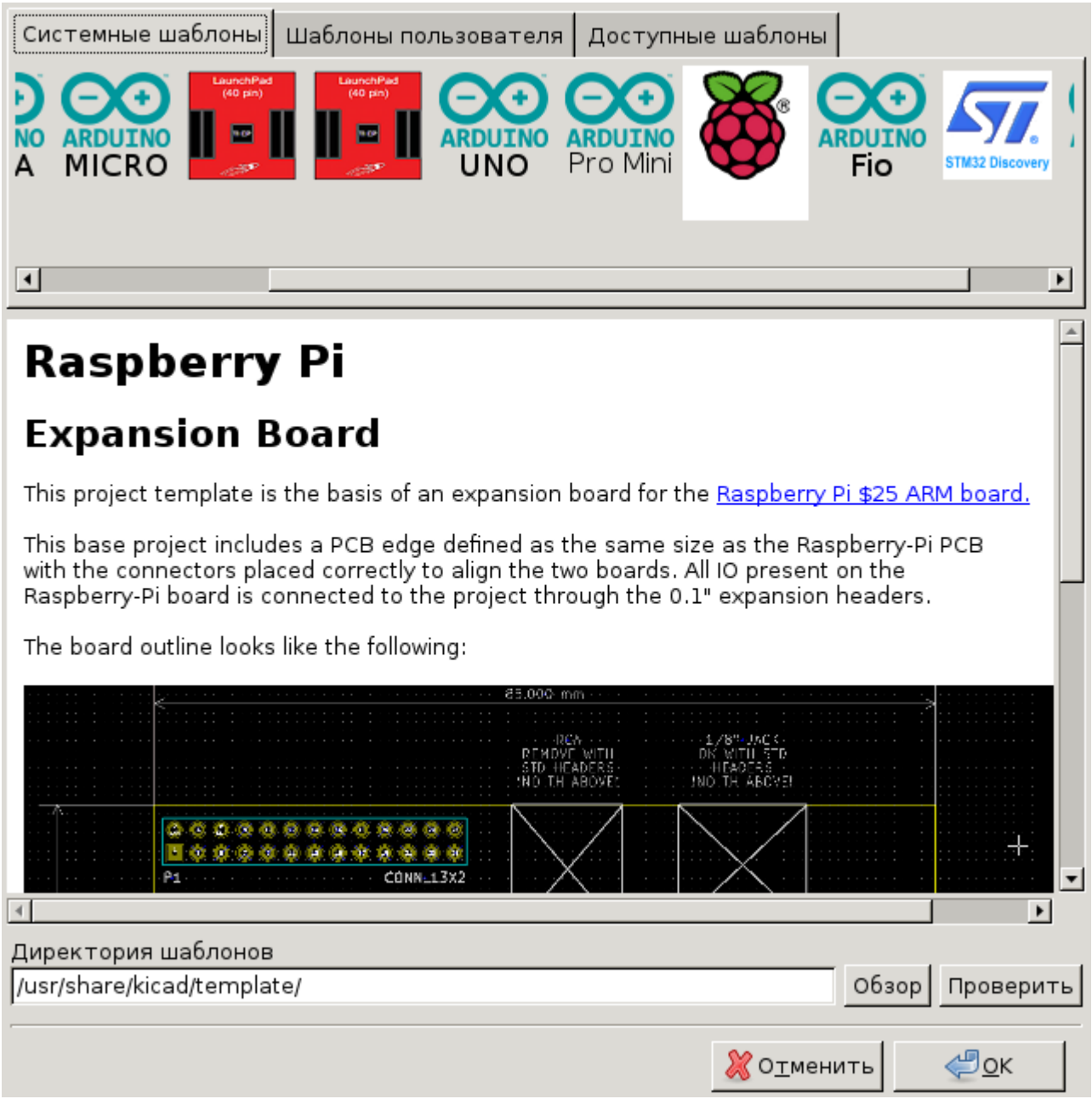
Using a project template facilitates setting up a new project with predefined settings. Templates may contain pre-defined sheet sizes, drawing sheets, board outlines, connector positions, schematic elements, design rules, logos, etc. Complete schematics and/or PCBs used as seed files for the new project may even be included.

Использование шаблонов

Creating a new project (**File → New Project...**) opens the Project Template Selector dialog. By default, all installed templates are shown in the list of templates, but you can limit the list to system templates or user templates using the dropdown menu above the list.

- *System templates* are installed with KiCad and include templates for designs in some common form factors.
- *User templates* are any templates created by you. The default, blank KiCad template is also considered a user template.

When you click on a template, information about the template is shown in the right panel.



A further click on the **OK** button creates a new project based on the selected template. You can pick the name of the new project and where to create it. The template files will be copied to the new project location and renamed to reflect the new project's name.

Template locations

When you create a new project, the Project Template Selector dialog shows templates from two locations:

- System Templates are templates in the path defined by the `KICAD10_TEMPLATE_DIR` path variable. These templates are installed with KiCad's default libraries and generally should not be modified by users.
- User templates are templates in the path defined by the `KICAD_USER_TEMPLATE_DIR` path variable. When you create your own project templates, store them in this location so you can use them when you create a new project.

To change the location of the user template folder, edit the `KICAD_USER_TEMPLATE_DIR` path variable in your paths configuration.

Template contents

A KiCad template is a directory containing the template project files, as well as some required metadata for the template in a subdirectory named `meta`. The name of the directory containing the template files determines the name of the template. This means that a KiCad template folder is simply a KiCad project folder with an additional `meta` subdirectory.

When you create a project from a template, KiCad copies the template files to the new project directory, renaming them to match the new project name as described below. All files in the template are copied, with two exceptions:

- Files with names beginning with the `.` character (dotfiles) are not copied. There is a special case for files named `.gitignore` or `.gitattributes`, which are copied if they exist.
- The `meta` directory is not copied.

NOTE	Other than the two exceptions above, all files in the template are copied, even if they are not KiCad design files. This means you can use templates to create projects that are already set up with non-KiCad files you need to include, such as documentation templates, license files, logos, `.gitignore` files, etc.

Template metadata

A template's `meta` directory must contain an HTML file named `info.html`, which is displayed in the KiCad template browser and should contain basic information describing the template. Basic HTML features are supported, including images. Any images referenced by `info.html` should also be stored in the `meta` directory.

The `<title>` tag determines the name of the template that is displayed during template selection. Note that the project template name will be cut off if it's too long. This display name does not need to be the same as the template directory name.

Here is a sample `info.html` file:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
<HTML>
<HEAD>
<META HTTP-EQUIV="CONTENT-TYPE" CONTENT="text/html;
charset=windows-1252">
<TITLE>Raspberry Pi - Expansion Board</TITLE>
</HEAD>
<BODY LANG="fr-FR" DIR="LTR">
<P>This project template is the basis of an expansion board for the
<A HREF="http://www.raspberrypi.org/" TARGET="blank">Raspberry Pi $25
ARM board.</A> <BR><BR>This base project includes a PCB edge defined
as the same size as the Raspberry-Pi PCB with the connectors placed
correctly to align the two boards. All IO present on the Raspberry-Pi
board is connected to the project through the 0.1&quot; expansion
headers. <BR><BR>The board outline looks like the following:
</P>
<P><IMG SRC="brd.png" NAME="brd" ALIGN=BOTTOM WIDTH=680 HEIGHT=378
BORDER=0><BR><BR><BR><BR>
</P>
<P>(c)2012 Brian Sidebotham<BR>(c)2012 KiCad Developers</P>
</BODY>
</HTML>
```

Finally, `meta` can optionally contain an image named `icon.png`, which will be used as the template's icon in the template selection dialog. The icon should be a 64 x 64 pixel PNG image.

Template file renaming

All files and directories in a template are copied to the new project path when a project is created using a template, except `meta` and dotfiles. Files and directories containing the template directory name will be renamed with the new project file name. Files and directories that don't contain the template name keep their original name.

For example, using a template named `example` (left) to create a project named `newproject` (right), with renamed files shown in **bold**:

Files in template `example` directory	**Files created in project `newproject` directory**
`example.kicad_pro`	**`newproject.kicad_pro`**
`example.kicad_sch`	**`newproject.kicad_sch`**
`example.kicad_pcb`	**`newproject.kicad_pcb`**
`example-first.kicad_sch`	**`newproject-first.kicad_sch`**
`second-example.kicad_sch`	**`second-newproject.kicad_sch`**
`third.kicad_sch`	`third.kicad_sch`
`third.kicad_pcb`	`third.kicad_pcb`

A template does not need to contain a complete project. If a required project file is missing, KiCad will create the file using the default create project behavior:

Files in template `example` directory	Files created in `newproject` directory

`example.kicad_sch`
`first-example.kicad_sch`
`first-example.kicad_pcb`
`second-example.kicad_sch`
`second-example.kicad_pcb`
	`newproject.kicad_sch`
	`first-newproject.kicad_sch`
	`first-newproject.kicad_pcb`
	`second-newproject.kicad_sch`
	`second-newproject.kicad_pcb`
	`newproject.kicad_pro` (default)
	`newproject.kicad_pcb` (default)

As an exception to the template name renaming rule, if the template contains one project file (`.kicad_pro`) and its name doesn't match the template name, KiCad will do the renaming based on that project file name instead:

Files in template `example` directory	Files created in `newproject` directory

`example.kicad_sch`
`example.kicad_pcb`
`first-example.kicad_pro`
`first-example.kicad_sch`
`first-example.kicad_pcb`
`second-example.kicad_sch`
`second-example.kicad_pcb`
	`example.kicad_sch`
	`example.kicad_pcb`
	`newproject.kicad_pro`
	`newproject.kicad_sch`
	`newproject.kicad_pcb`
	`second-example.kicad_sch`
	`second-example.kicad_pcb`

WARNING Не рекомендуется создавать шаблоны с несколькими файлами проекта.

Creating new templates

Because a KiCad template is just a Kicad project with an additional metadata folder, the easiest way to create a new template is to start from a project. If you save a project in your user template folder and add a `meta` folder to it, you can use it as a template.

TIP To find out where your user template folder is, check the value of the `KICAD_USER_TEMPLATE_DIR` path variable in the Configure Paths dialog (**Preferences → Configure Paths...**).

If you are creating a template from scratch, you can create a new project in the user template folder, then edit the project until you have created your desired template. This new project will be your template, so when you create it you should choose the name based on what you want the template to be called.

If you have an existing project that you want to turn into a template, you can save a copy of that project into your user template folder (**File → Save As...** from the Project Manager). The name you choose for the re-saved project will be the template name. After saving in the template folder, you can edit the template project so that it exactly matches your desired template.

In either case, templates are required to have a metadata directory, so you must add a `meta` folder inside the template folder. The metadata folder must also contain an `info.html` file, which is intended to contain a description of the template. You can copy the sample `info.html` above as a starting point.

In general, you will also want to remove any files and folders that you don't want to include each time you use the template. Some examples of things to remove include the `*-backups` folder, the `.history` snapshot folder, any unneeded version control files (`.git`, etc.), and anything else you don't want to include in new projects.

Менеджер плагинов и содержимого

KiCad has a Plugin and Content Manager that lets you browse, install, and manage packages submitted by other users and organizations. Packages can be plugins offering specialized functionality, tools for ordering PCBs from specific manufacturers, libraries of symbols and footprints, or new editor color schemes. You can access the PCM by launching it from the main KiCad Project Manager window.

The PCM downloads packages from repositories on the internet. Each repository is a collection of packages that is managed by an individual or an organization. By default, the PCM uses a single repository managed by the KiCad organization. Users and organizations are free to create their own repositories, which other users can can then add as additional repositories in their own KiCad installation. Third-party repositories can be public or private.

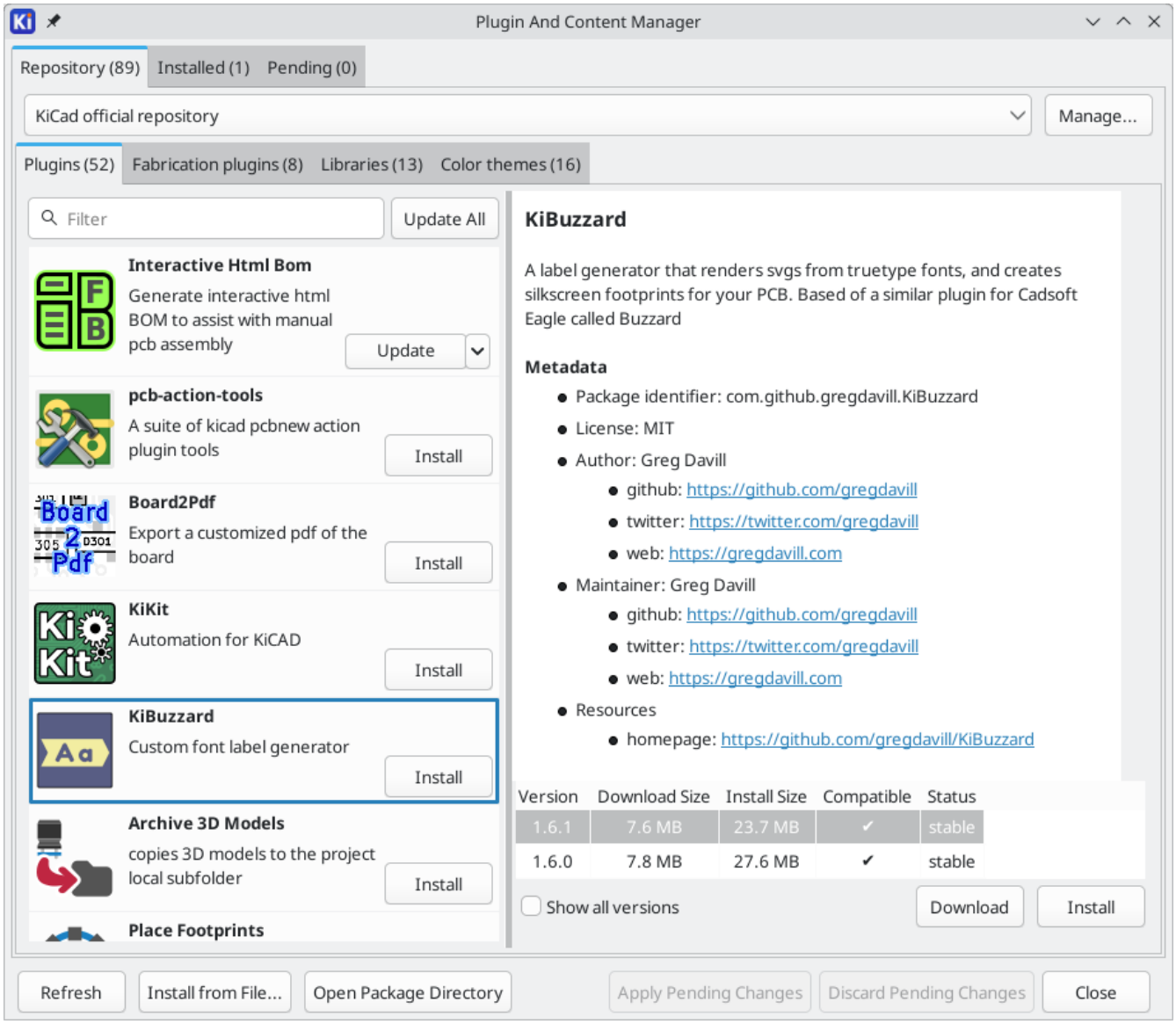
NOTE Packages may install code that runs on your computer. Packages are not developed by the KiCad developers. The KiCad organization does not make any guarantees about the quality or safety of packages installed through the PCM. Make sure you only install packages that you trust.

NOTE If you have feedback regarding a package, please submit it to the package's developer, not the KiCad team. Contact information for each package is shown in the package's description.

To share a package that you have developed, you can submit it to the KiCad official repository. If it is accepted, it will then be available to other users browsing the KiCad repository. You can also create your own repository or submit your package to a repository managed by another person or group, but in that case users will not see your package unless they have configured that repository in their own installation. More information about creating your own packages and repositories is available below.

Browsing packages

All of the packages in a repository are shown in the PCM's **Repository** tab. You can choose which repository to browse by selecting the repository in the dropdown at the top of the tab. By default, only the KiCad official repository is enabled.



Packages are grouped into four categories, each with its own tab within the **Repository** tab:

- **Plugins** are additional tools that can be launched from the PCB Editor. Plugins can have many purposes, for example modifying a board design or generating specific outputs. Footprint wizards can also be distributed as plugins.
- **Fabrication plugins** are a sub-category of plugins for ordering your PCBs from specific fabricators. These plugins may be a convenient way to order from a manufacturer, but they are typically not required; you can usually provide manufacturers with normal fabrication outputs instead. Consult with your manufacturer to find out the best way to order from them.
- **Libraries** contain symbols, footprints, and/or 3D models. By default, libraries installed by a library package are automatically added to the appropriate symbol and/or footprint library tables when the package is installed, and removed from the table when the package is uninstalled. Libraries installed by a package have configurable library name prefix (`PCM_` by default). These settings are configurable in the **Packages and Updates** section of Preferences.
- **Color themes** are color themes for the Schematic, Symbol, Board, and Footprint editors. You can select an installed theme in the **Colors** section of the Preferences for each editor.

The list on the left of the window shows the packages within each category. You can filter the list of packages by typing in the filter box at the top of the package list. Press the **Refresh** button to reload the list of packages from the online repository.

When you select a package in the list, information about the package is shown on the right. This includes a description of the package, the package's license, and contact information for the package's developer, including a place to report bugs and other feedback for the package.

The package information also includes a table of the versions of the package that are currently available. For each version, the table displays the package size, its status, and whether it is compatible with your version of KiCad.

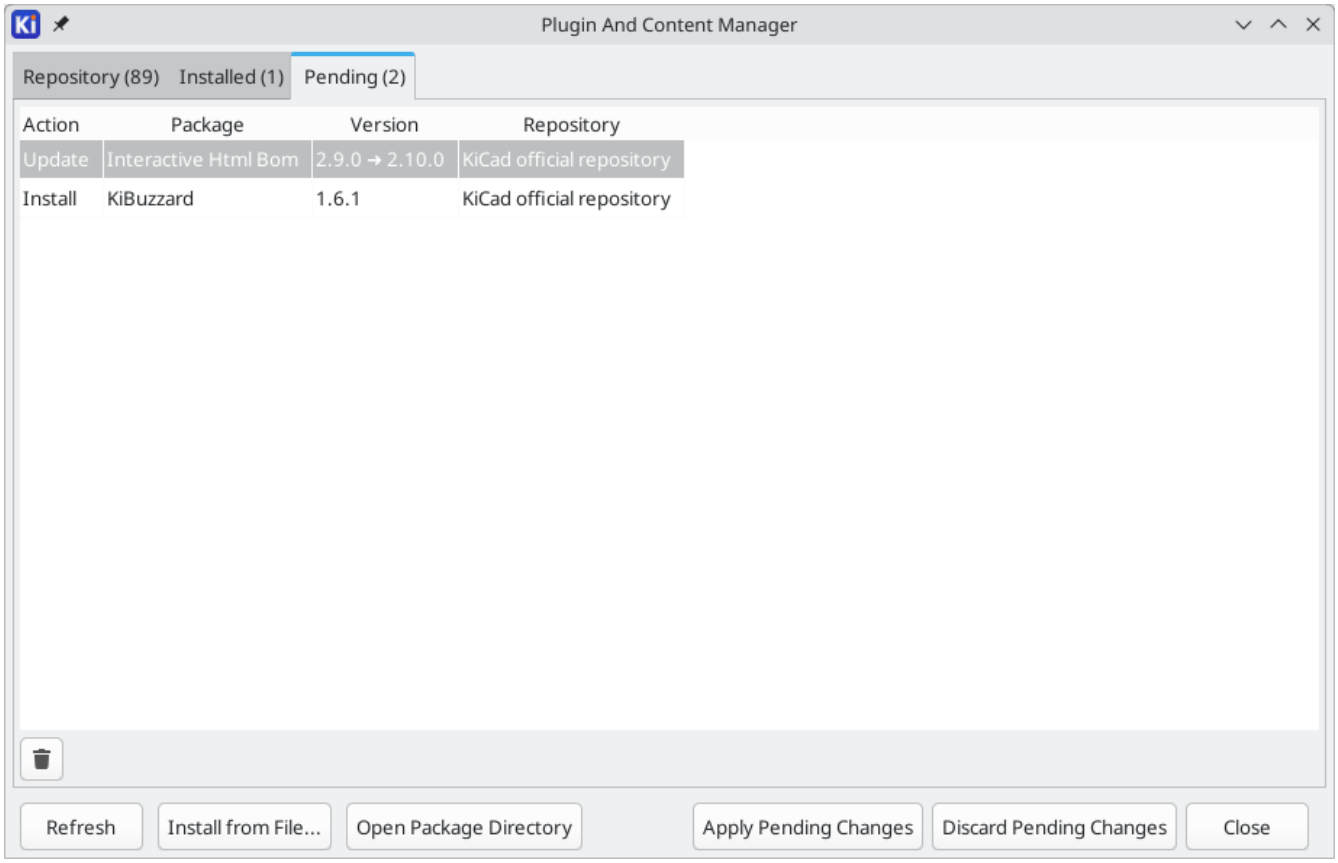
A package's status can be one of the following, as indicated by the package's developer:

- Stable: the package version is suitable for general use.
- Testing: the package version is in a testing phase; users should be cautious and report any issues they encounter to the package's developers.
- Development: the package version is in a development phase; users should not expect it to work fully.
- Deprecated: the package is no longer maintained.

By default, the version table only shows versions of the package that are compatible with your version of KiCad. You can show all versions of the package, even those that will not work with your KiCad version, by checking the **Show all versions** box. If multiple versions of a package are available, you can choose which to install.

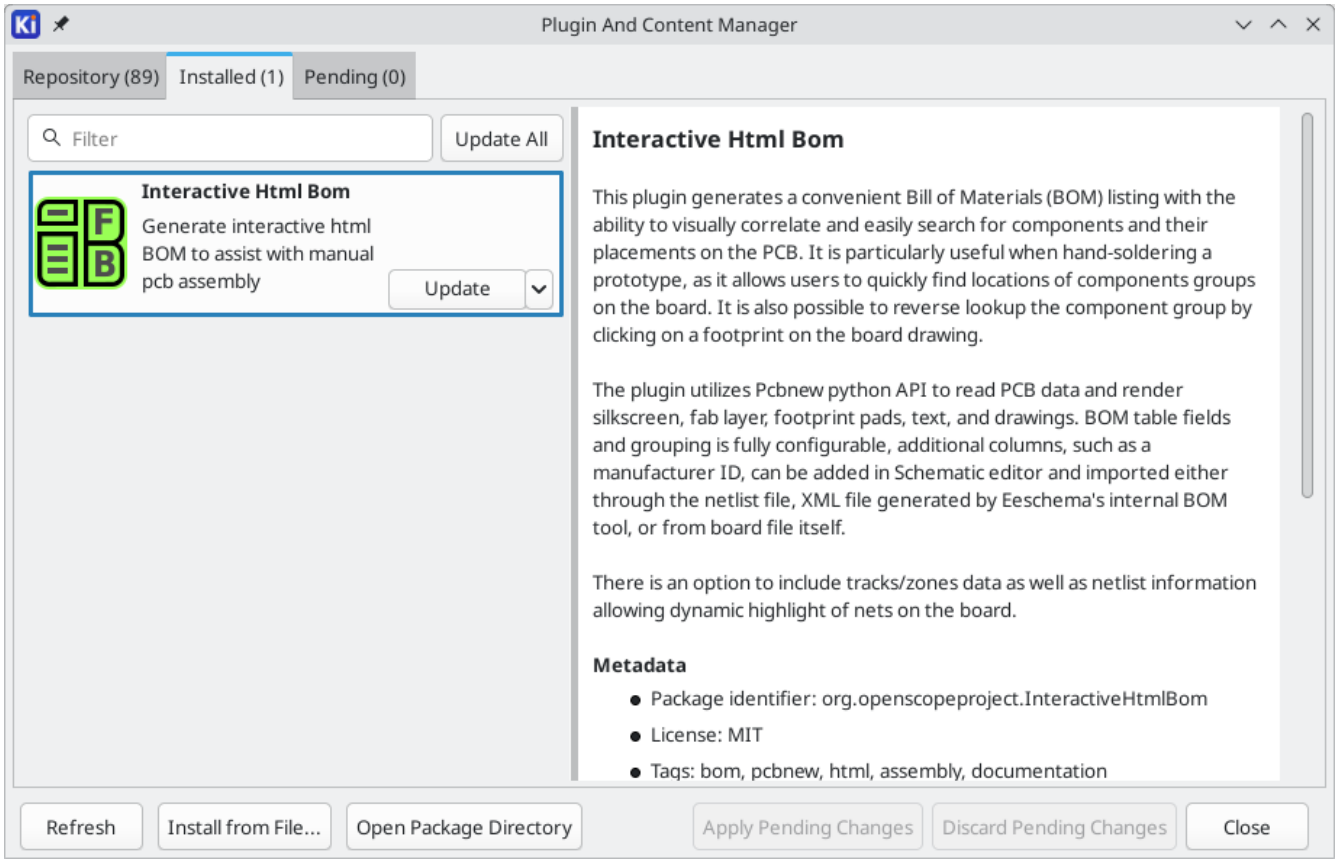
Installing packages

When you decide to to install a package, click the package's **Install** button in the package's description page. If there are multiple versions of the package available, select the desired version in the version table before installing. You can also install the latest version by clicking the **Install** button in the list of packages. This does not immediately install the package; the package is instead queued for later installation and is shown in the **Pending** tab. The package will not be installed until you click the **Apply Pending Changes** button, which installs all pending packages at once.

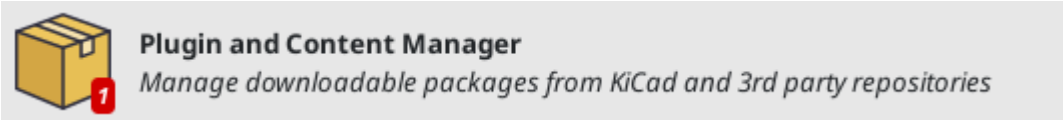


To remove a single package from the pending installation list, select it in the **Pending** tab and press the button. To cancel the installation of all pending packages, click the **Discard Pending Changes** button.

Once a package is installed, it is listed in the **Installed** tab. In this tab you can see the list of installed packages and update or uninstall any of them.



If any packages have new versions available, the PCM icon in the Project Manager displays an indicator showing the number of available updates.



To update to a different version of a package, select the new version in its version table and click the **Update** button. You can also update a package to the newest version by clicking **Update** in the dropdown menu next to its **Uninstall** button in the list of installed packages. To update all installed packages, click the **Update All** button at the top of the installed package list. A package will not be updated if **Pin Package** is selected in its dropdown menu.

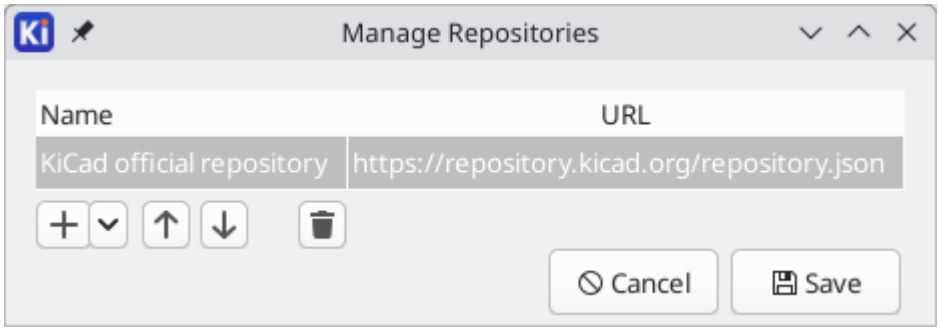
To uninstall a package, click its **Uninstall** button in the list of installed packages or in the package's description page.

As with installation, packages are not updated or uninstalled immediately when you click the **Update** or **Uninstall** button. Instead, the operation is queued in the **Pending** tab until you apply each change individually or click the **Apply Pending Changes** button.

Finally, you can download a package without installing it by clicking the **Download** button at the bottom of the package's description and selecting a location to save the package. This lets you inspect the files in the package before installing it. To install a package that has been downloaded but not yet installed, click the **Install from file...** button and select the package. The **Open Package Directory** button opens a file browser in the folder where KiCad installs packages.

Managing repositories

By default, only the KiCad official repository is used by the PCM. You can add a third party repository, or remove existing repositories, by clicking the **Manage...** button at the top of the **Repository** tab.



To add a repository, click the + button and specify the full URL to the repository. To remove a repository, select it and press the 🗑 button. Use the ↑ and ↓ buttons to reorder repositories in the list.

If you remove the default KiCad official repository, you can easily re-add it by clicking **Add Default Repository** in the dropdown menu next to the + button.

Creating packages and repositories

To create a package for the PCM, follow the instructions at https://dev-docs.kicad.org/en/addons/index.html. These instructions explain how to create PCM packages for any repository, including but not limited to the KiCad official repository. They also explain the rules for packages included in the KiCad repository and how

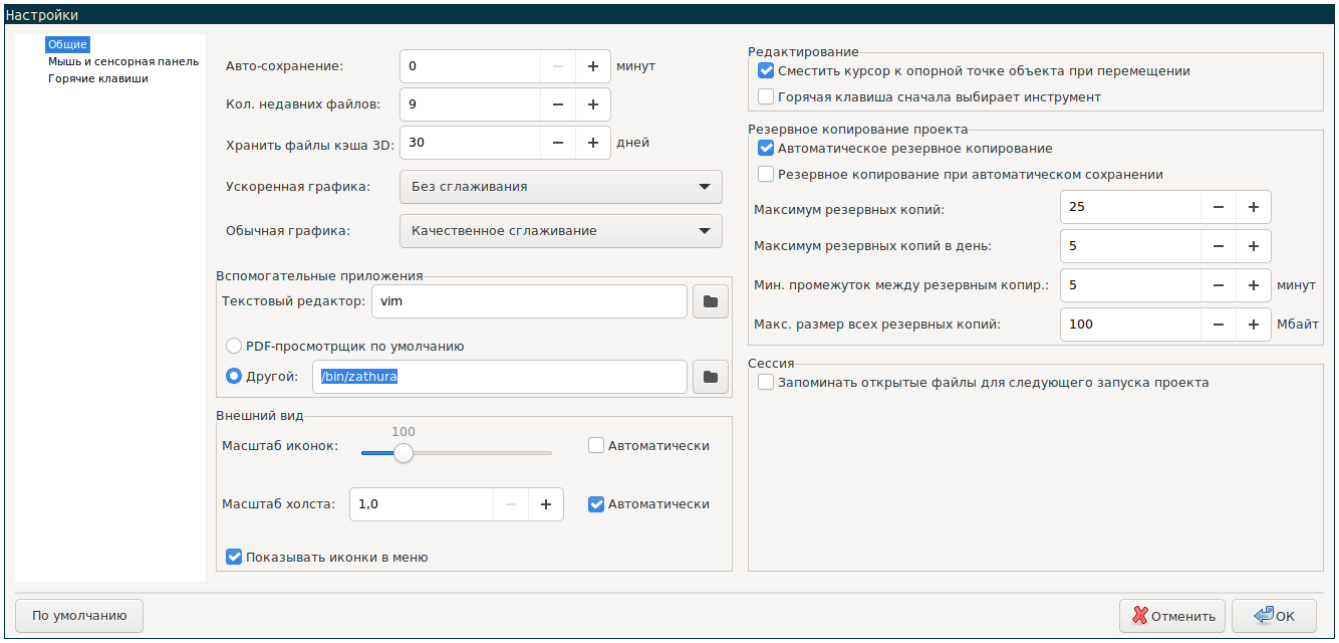
to submit packages to this repository. Third-party repositories use the same package format but may have different rules and procedures for submitting packages.

To create your own repository, publish a repository JSON file following the schema published at https://go.kicad.org/pcm/schemas/v1.

KiCad preferences

The KiCad preferences can always be accessed from the **Preferences** menu, or by using the hotkey (default `Ctrl` + `,`). The Preferences dialog is shared between the running KiCad tools. Some preferences apply to all tools, and some are specific to a certain tool (such as the schematic or board editor).

Общие настройки



Ускоренная графика: KiCad может использовать различные методы сглаживания при отрисовке средствами графического адаптера. Эти методы могут выгладить по-разному на разном оборудовании, поэтому следует поэкспериментировать для поиска наилучшего отображения.

Обычная графика: KiCad может также выполнять сглаживание в режиме совместимости, используя программные средства. Активация этой функции может привести к замедлении работы на некотором оборудовании.

Текстовый редактор: определяет текстовый редактор для открытия текстовых файлов из дерева менеджера проектов.

PDF-просмотрщик: определяет приложение для открытия PDF-файлов.

Показать иконки в меню: включает отображение иконок в контекстном меню KiCad.

NOTE	На некоторых операционных системах иконки не отображаются в меню.

Show scrollbars in editors: When enabled, scrollbars are displayed next to the editing canvases in each tool. When disabled, scrollbars are not shown.

Focus follows mouse between schematic and PCB editors: When enabled, the window under the mouse cursor will automatically become focused.

Масштаб иконок: устанавливает размер иконок, которые используются в меню и на кнопках в KiCad. Отметьте *Автоматически* для автоматического подбора оптимального масштаба иконок на

основе параметров операционной системы.

Тема иконок: определяет какой набор иконок использовать, для светлого или тёмного фона. Значение по умолчанию - автоматически. Тема будет определена на основе цвета фона окна используемого системой.

High-contrast mode dimming factor: Sets how much non-focused items are dimmed in high-contrast display mode.

Сместить курсор к опорной точке объекта при перемещении: если отмечено, курсор мыши будет перемещён на опорную точку объекта в начале операции его перемещения.

Горячая клавиша сначала выбирает инструмент: без этой опции, нажатие горячей клавиши для, к примеру, команды *Добавить проводник* сразу же начнёт выполнение этой команды, начиная с текущей позиции курсора. Если отмечено, нажатие горячей клавиши в первый раз только активирует инструмент *Добавить проводник* и не создаст проводник под курсором.

Запоминать открытые файлы для следующего запуска проекта: если отмечено, KiCad автоматически откроет все файлы, которые были открыты при последнем закрытии менеджера проектов.

Авто-сохранение: при редактировании файлов схемы либо платы, KiCad может автоматически выполнять периодическое сохранение проделанной работы. Чтобы отключить эту функцию установите `0`

Кол. недавних файлов: определяет количество элементов в списке недавно открытых файлов

Хранить файлы кэша 3D: KiCad создаёт кэш для 3D моделей, чтобы ускорить работу 3D-просмотрщика. Можно настроить как долго стоит хранить кэш перед удалением устаревших файлов.

Автоматическое резервное копирование: если отмечено, проекты KiCad будут архивироваться в ZIP-файлы автоматически согласно следующим настройкам. Архивы хранятся в подкаталоге каталога проекта. Резервные копии создаются при сохранении файлов проекта.

Резервное копирование при автоматическом сохранении: если отмечено, резервные копии будут создаваться при каждом автоматическом сохранении (если резервная копия разрешена следующими настройками). Этот параметр имеет значение только если интервал автоматического сохранения не равен `0` (не отключён).

Максимум резервных копий: при создании новой резервной копии, старые копии будут удаляться, чтобы общее число файлов резервных копий не превышало указанного лимита.

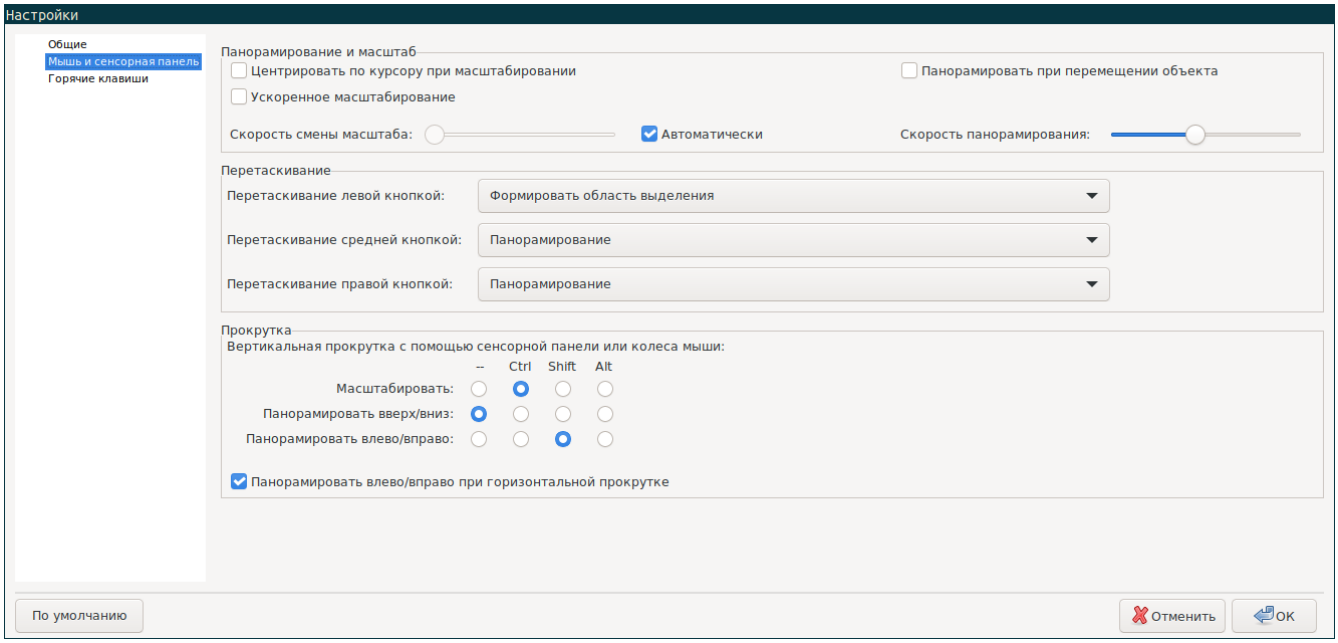
Максимум резервных копий в день: при создании новой резервной копии, старые копии, созданные в этот же день, будут удаляться, чтобы не превысить указанный лимит.

Мин. промежуток между резервным копир.: если настало время создания резервной копии (например, при сохранении файла платы) и существует резервная копия, созданная раньше чем указанный интервал, резервная копия не будет создана.

Макс. размер всех резервных копий: при создании новой резервной копии файлы старых резервных копий будут удаляться, чтобы общий размер каталога с резервными копиями не

превышал указанный предел.

Мышь и сенсорная панель



Центрировать по курсору при масштабировании: если отмечено, перед масштабировании с помощью горячих клавиш или колеса мыши изображение будет отцентрировано по положению курсора.

Ускоренное масштабирование: если отмечено, прокрутка с помощью колеса мыши или сенсорной панели будет происходить быстрее.

Скорость смены масштаба: определяет на какую величину должен смениться масштаб при прокрутке мышью или сенсорной панелью. Установите отметку *Автоматически* чтобы использовать значение по умолчанию, которое зависит от настроек операционной системы.

Панорамировать при перемещении объекта: если отмечено, изображение можно панорамировать при перемещении объекта, поднося его к краю области редактирования.

Скорость панорамирования: определяет как быстро должно выполняться панорамирование при перемещении объекта.

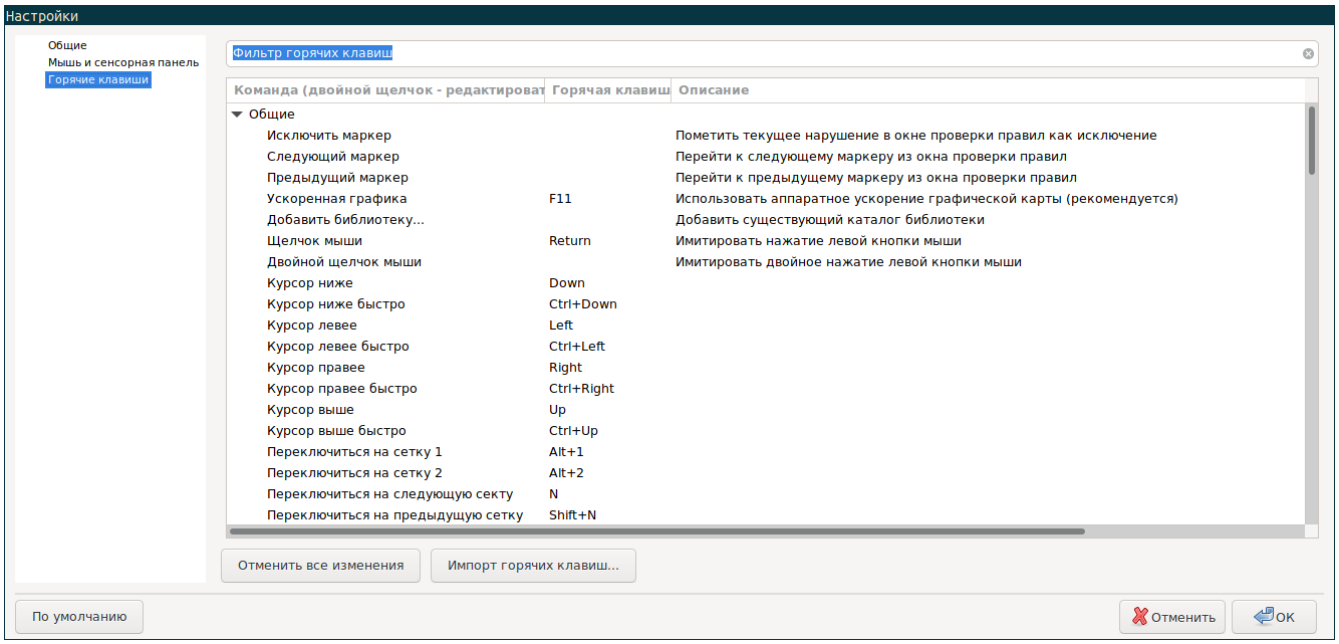
Кнопки мыши: можно настроит поведение при перетаскивании средней кнопкой мыши и нажатии правой кнопки мыши: смена масштаба, панорамирование или ничего не делать. Также можно настроить поведение при перетаскивании с нажатой левой кнопки мыши в редакторе при наличии выделенных элементов или без них.

NOTE	Левая кнопка мыши всегда используется для выделения и управления объектами.

Прокрутка колесом мыши и сенсорной панелью: можно настроить поведение при прокрутке колесом мыши или сенсорной панелью с нажатой определённой клавишей-модификатором.

Панорамировать влево/вправо при горизонтальной прокрутке: если отмечено, можно выполнять горизонтальное панорамирование с помощью сенсорной панели или второго колеса мыши (если оно имеется).

Горячие клавиши



С помощью этого диалогового окна можно настроить горячие клавиши, используемые для управления KiCad. Горячие клавиши в разделе *Общие* относятся ко всем приложениям KiCad. Горячие клавиши определённых приложений KiCad отображаются когда эти приложения запущены. Можно задавать одинаковые горячие клавиши для различных операций в разных приложениях KiCad (например, в редакторе схем и в редакторе плат), но нельзя задавать одну и ту же горячую клавишу для разных операции одного приложения.

Имеется огромное количество команд, поэтому не всем присвоены горячие клавиши по умолчанию. Можно добавить горячую клавишу для любой команды с помощью двойного щелчка мыши по команде в списке. Если желаемая горячая клавиша уже занята, можно указать использовать эту горячую клавишу для выбранной команды, при этом горячая клавиша конфликтной команды будет удалена.

Changes that you have made to hotkey assignments are shown with a `*` character at the end of the command name. You can undo changes to a specific command by right-clicking that command and selecting **Undo Changes**, or you can undo all changes with the button below the command list.

Importing hotkeys

Настройки горячих клавиш хранятся в файлах `.hotkeys` в каталоге настроек KiCad (см. раздел Настройки для получения информации о том где располагается каталог с настройками в операционной системе). Если имеются настройки горячих клавиш, которые хотелось бы задействовать на другом компьютере, можно скопировать файлы `.hotkeys` и импортировать их на другой машине.

Actions reference

Below is a list of every available **action** in the KiCad Project Manager: a command that can be assigned to a hotkey.

KiCad Project Manager

The actions below are available in the KiCad Project Manager. Hotkeys can be assigned to any of these actions in the **Hotkeys** section of the preferences.

Action	Default Hotkey	Description
Close Project		Close the current project
Image Converter	Ctrl + B	Convert bitmap images to schematic or PCB components
Drawing Sheet Editor	Ctrl + Y	Edit drawing sheet borders and title block
Footprint Editor	Ctrl + F	Edit PCB footprints
PCB Editor	Ctrl + P	Edit PCB
Schematic Editor	Ctrl + E	Edit schematic
Symbol Editor	Ctrl + L	Edit schematic symbols
Clone Project from Repository…		Clone a project from an existing repository
New Project from Template…	Ctrl + T	Create new project from template
New Project…	Ctrl + N	Create new blank project
Open Demo Project…		Open a demo project
Open Project…	Ctrl + O	Open an existing project
Open Text Editor		Launch preferred text editor
Plugin and Content Manager	Ctrl + M	Run Plugin and Content Manager
Calculator Tools		Run component calculations, track width calculations, etc.
Gerber Viewer	Ctrl + G	Preview Gerber output files