GOWIN

PROGRAMMING FOR THE FUTURE

GOWIN MCU Designer

User Guide

SUG549-1.4E, 06/01/2020

Disclaimer

Revision History

Date	Version	Description
7/29/2019	1.0E	Initial version published.
9/12/2019	1.1E	● Integrated GNU ARM and RISC-V MCU compilation tool chain; ● Updated the Eclipse to the latest version at website; ● Updated the GNU ARM MCU compilation tool chain to the latest version at website; ● Updated and optimized Interface Configuration.
11/12/2019	1.2E	● Updated the GNU RISC-V MCU compilation tool chain to the latest version at GNU website; ● IDE integrated with Java Development Kit and IDE installation flow simplified; ● IDE integrated with Gowin Programmer; ● Gowin Customized IDE interface and simplified options to improve the ease of use; ● Known issues of IDE installation and usage fixed.
12/10/2019	1.3E	● License Management; ● IDE Interface optimized.
06/01/2020	1.4E	● Gowin_EMPU (GW1NS-4C) and Gowin_EMPU_M3 programming design, compilation, downloading and online debugging supported; ● Gowin_PicoRV32 software online debugging supported; ● The debugging software called OpenOCD integrated; ● Olimex debugging emulator driver software integrated; ● The download tool called Programmer updated and download of Gowin_EMPU (GW1NS-4C) supported ; ● Gowin_EMPU (GW1NS-2C), Gowin_EMPU_M1, Gowin_EMPU (GW1NS-4C), Gowin_EMPU_M3, and Gowin_PicoRV32 software programming reference design example updated; ● Help system and online viewing of GMD and Gowin MCU user manuals supported.

Contents

List of Figures

List of Tables

1 About This Guide

1.1 Purpose

This manual describes GOWIN MCU Designer installation and operation and aims to help users learn the software functions to improve design efficiency. The software screenshots and the supported products listed in this manual are based on GOWIN MCU Designer. As the software is subject to change without notice, some information may not remain relevant and may need to be adjusted according to the software that is in use.

1.2 Related Documents

The latest user guides are available on GOWINSEMI Website. You can find the related documents at www.gowinsemi.com:

- IPUG536, Gowin_EMPU_M1 IDE Software Reference Manual
- RN519, Gowin_EMPU(GW1NS-2C) IDE Software Reference Manual
- IPUG928, Gowin_EMPU(GW1NS-4C) IDE Software Reference Manual
- IPUG919, Gowin_EMPU_M3 IDE Software Reference Manual
- IPUG910, Gowin_PicoRV32 IDE Software Reference Manual

1.3 Terminology and Abbreviation

Table 1-1 shows the abbreviations and terminology used in this manual.

Table 1-1 Terminology and Abbreviations

Terminology and Abbreviation	Full Name
MCU	Microcontroller Unit
FPGA	Field-Programmable Gate Array
SoC	System On Chip
RISC	Reduced Instruction-Set Computer
ARM	Advanced RISC Machine
RISC-V	RISC Five
GNU	GNU is Not Unix
GCC	GNU Compiler Collection
GDB	GNU Debug
OpenOCD	Open On-Chip Debugger
IDE	Integrated Development Environment
PC	Personal Computer

1.4 Support and Feedback

Gowin Semiconductor provides customers with comprehensive technical support. If you have any questions, comments, or suggestions, please feel free to contact us directly by the following ways:

Website: www.gowinsemi.com

E-mail: support@gowinsemi.com

2 GOWIN MCU Designer Overview

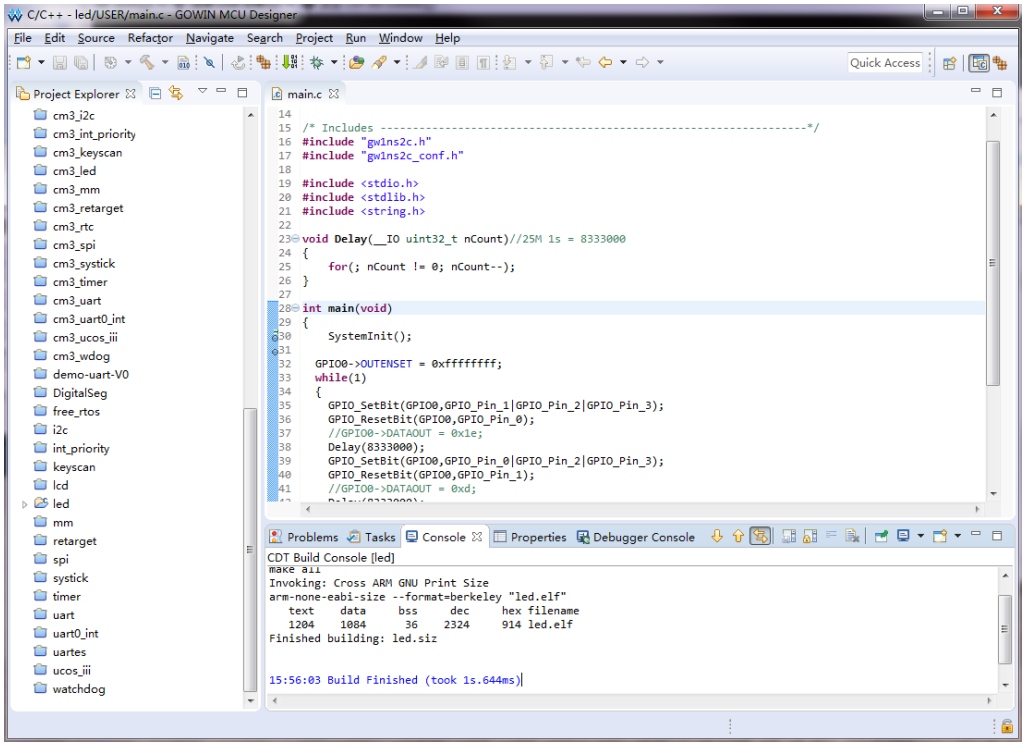
2.1 Introduction

GOWIN MCU Designer is a new generation of MCU software development environment self-developed by GOWIN according to its own FPGA+MCU SoC architecture features. It's based on GNU GCC compilation toolchain and open source Eclipse framework. It supports C/C++ embedded software programming language and helps users to quickly implement code compilation and linking, generate mapping files and download, etc. GOWIN MCU Designer also integrates an on-line debugging tool for users to quickly locate and analyze software programming issues.

GOWIN MCU Designer supports the MCU compilation toolchain of ARM architecture and RISC-V architecture and also supports MCU compilation, linking, downloading and debugging of ARM cortex-m1, ARM cortex-m3 and RISC-V architecture.

GOWIN MCU Designer provides a GUI for projects. Users can employ this software to quickly edit codes, check the running results, and start the GOWINSEMI FPGA download tool immediately to download the mapping file to the chip and implement the required functions. GOWIN MCU Designer GUI is as shown in Figure 2-1.

Figure 2-1 GOWIN MCU Designer GUI



2.2 Processors Supported

The processors, architectures, and chips that GOWIN MCU Designer supports are listed in Table 2-1.

Table 2-1 Processors Supported by GOWIN MCU Designer

Processor	Architecture	Chip
Gowin_EMPU (GW1NS-2C)	ARM Cortex-M3	GW1NS-2C GW1NSR-2C GW1NSE-2C
Gowin_EMPU (GW1NS-4C)	ARM Cortex-M3	GW1NS-4C GW1NSR-4C GW1NRSER-4C
Gowin_EMPU_M1	ARM Cortex-M1	GW1N-9 GW1NR-9 GW1N-9C GW1NR-9C GW2A-18 GW2AR-18 GW2A-18C GW2AR-18C GW2ANR-18C GW2A-55 GW2A-55C
Gowin_EMPU_M3	ARM Cortex-M3	GW2A-55 GW2A-55C
Gowin_PicoRV32	RISC-V	GW1N-9

Processor	Architecture	Chip
		GW1NR-9 GW1N-9C GW1NR-9C GW2A-18 GW2AR-18 GW2A-18C GW2AR-18C GW2ANR-18C GW2A-55 GW2A-55C

Note!

The supported processors may vary according to the software version in use. Please refer to the software you use for more detailed processor information.

3 Install GOWIN MCU Designer

3.1 Environment Requirement

Windows: Win7/8/10(64bit)

3.2 Software Download

You can download GOWIN MCU Designer installation package (GMD_V1.1.exe) via Gowin official website: https://www.gowinsemi.com/en/support/database/?support_search=MCU

Note!

Users need to register and log on to the Gowin website before downloading the installation package;

3.3 Software Installation

Note!

- You must close anti-virus programs, such as 360 or Kingsoft AntiVirus, etc. before installing GOWIN MCU Designer.
- The installation path should not contain any Chinese characters or spaces.
- Before installing any new versions of GOWIN MCU Designer, old versions should be uninstalled.
- Table 3-1 shows the product options for the installation of GOWIN MCU Designer.

Table 3-1 Components to Install

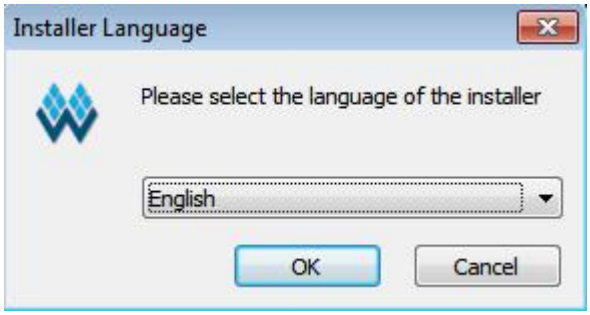
Components	Description	Remarks
GOWIN MCU Designer GUI	Graphic User Interface of GOWIN MCU Designer	Executable file: GMD_V1.1.exe
SEGGER J-Link Driver	SEGGER J-LINK Driver	–
Olimex Debug Driver	Olimex debugging emulator driver	Executable file: GMD\driver\zadig-2.5.exe

GMD Software Installation Flow

Please refer to the following steps to install GOWIN MCU Designer:

Double click the installation package and select the installer language (Simplified Chinese and English are supported). For example, select "English", click "OK", as shown in Figure 3-1.

Figure 3-1 Select Installer Language

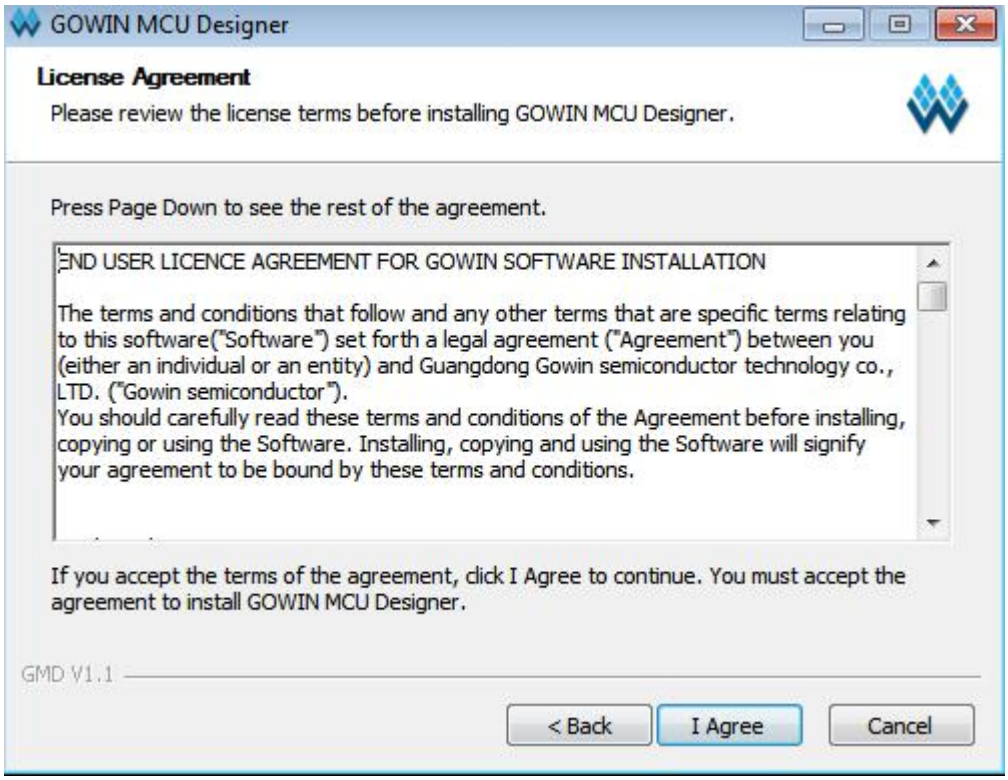


Click “Next” according to the install wizard, as shown in Figure 3-2.

Figure 3-2 Install Wizard

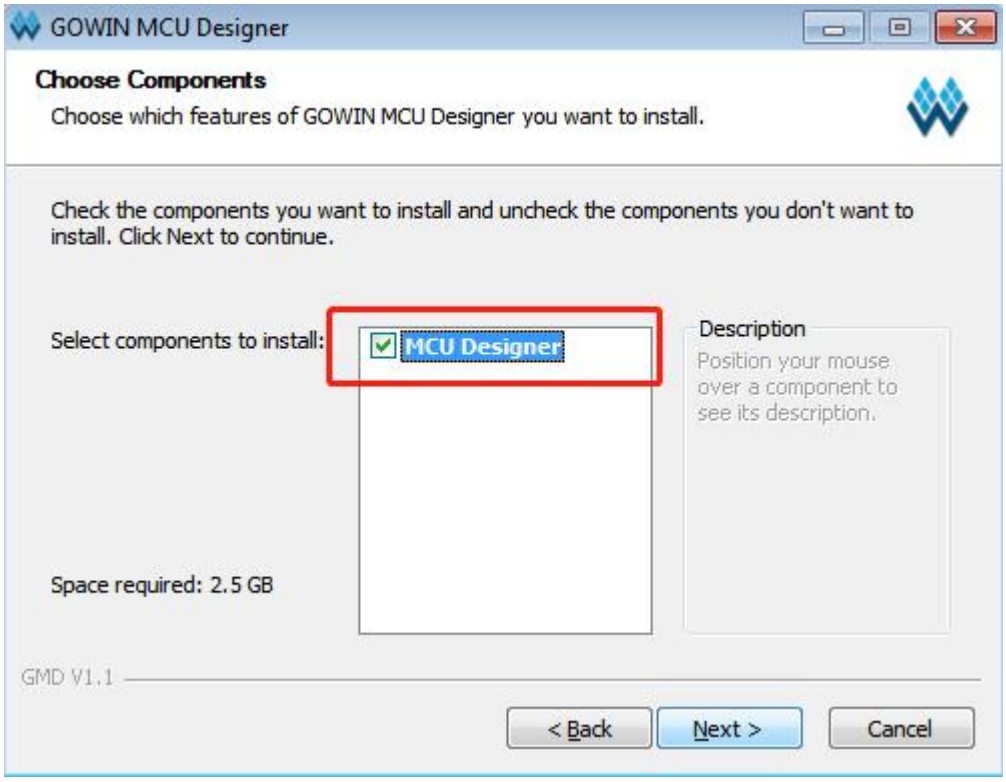
Select agree to the license agreement, as shown in Figure 3-3.

Figure 3-3 License Agreement



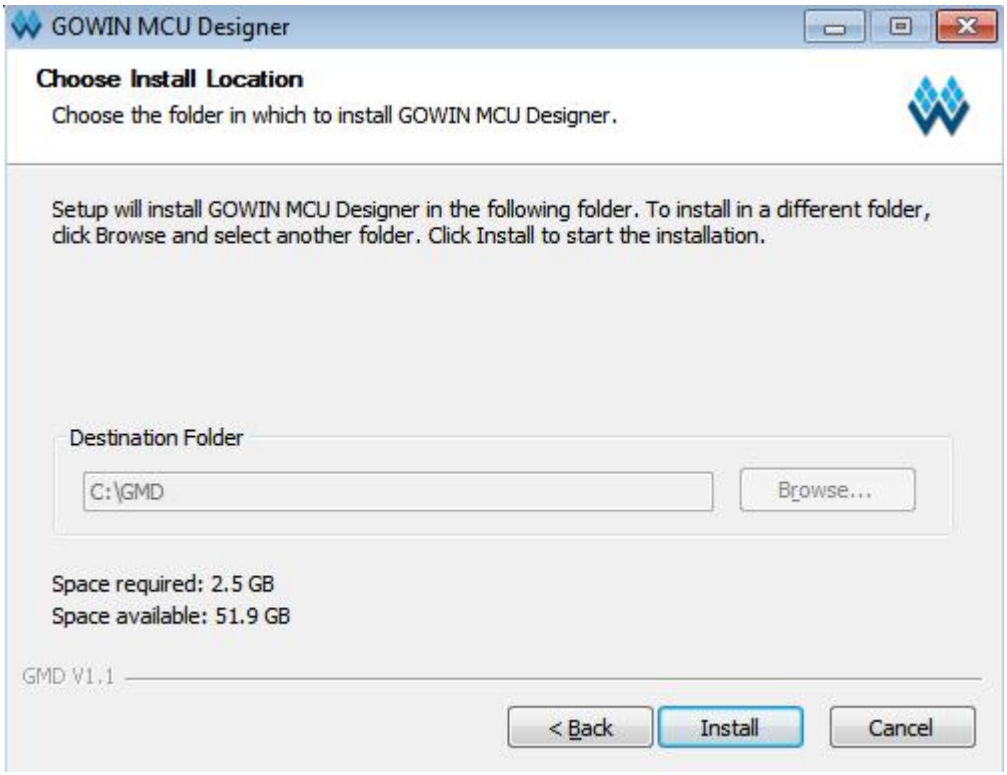
Select MCU Designer components. Default Settings are recommended. Click “Next”, as shown in Figure 3-4.

Figure 3-4 Select Components



Select the installation path. Click “Install”. The default installation location is C:\GMD, as shown in Figure 3-5.

Figure 3-5 Select Installation Path

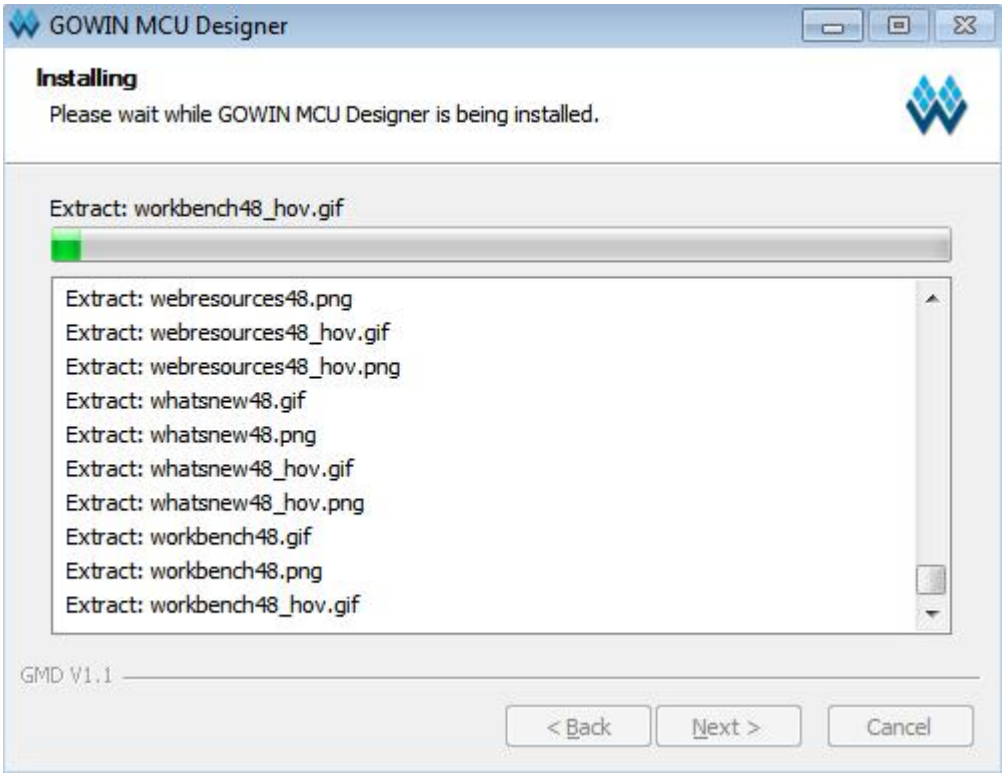


Note!

Installation Path cannot be changed during the installation of GOWIN MCU Designer (V1.1).

Please be patient with the MCU Designer installation process. The installation process is as shown in Figure 3-6.

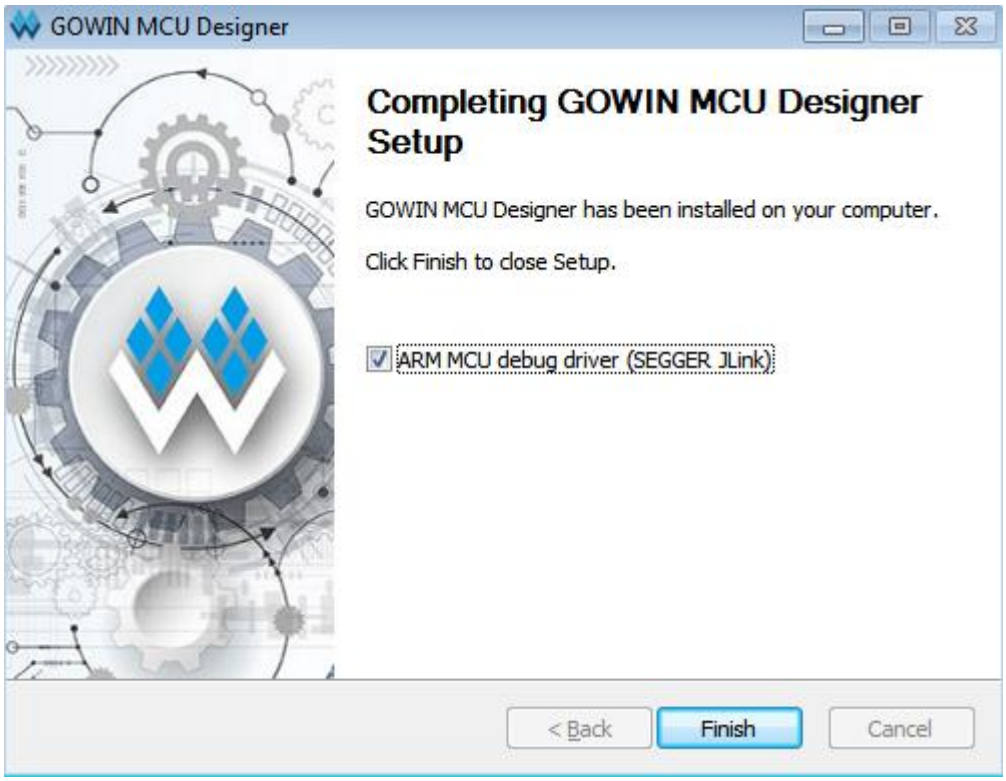
Figure 3-6 MCU Designer Installation Process



After installing MCU Designer, select whether to install the third-party debugging emulator driver software called ARM MCU debug driver (SEGGER JLink). If you select Install, start the ARM MCU debug driver (SEGGER JLink) installation process. If you do not choose to install, the GMD installation process is completed.

Click “Finish”, as shown in Figure 3-7.

Figure 3-7 ARM MCU Debug Driver Installation Option

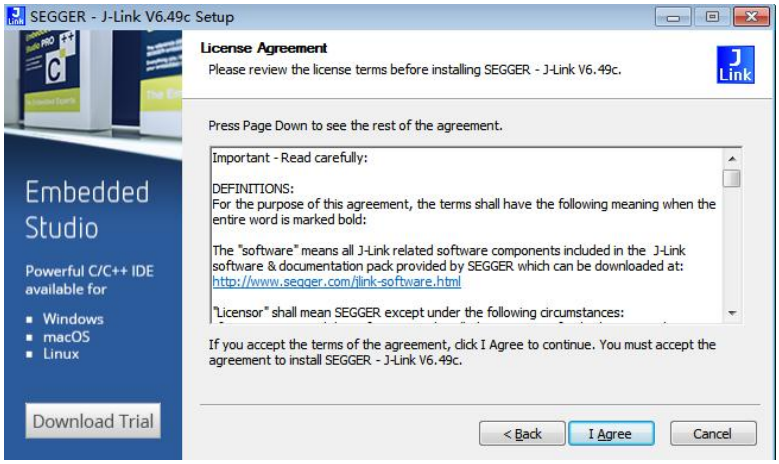


If you choose to install the ARM MCU debug driver (SEGGER JLink), then the installation of the SEGGER J-Link driver software begins. Click "Next", as shown in Figure 3-8.

Figure 3-8 J-Link Installation Wizard

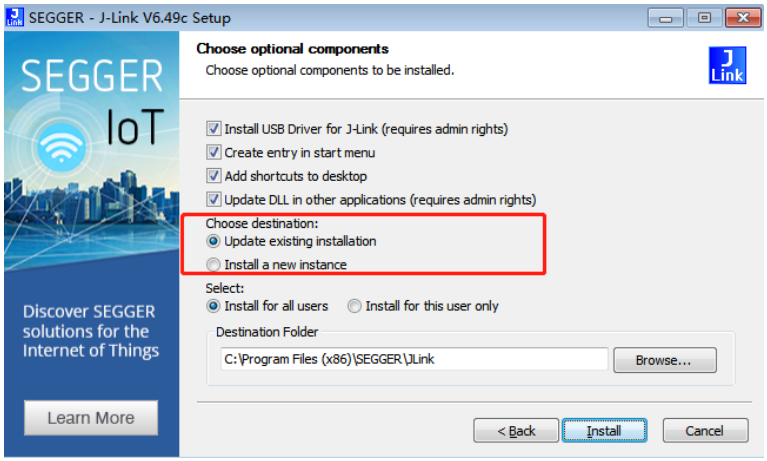
Click "I Agree" when it comes to the J-Link Installation License Agreement, as shown in Figure 3-9.

Figure 3-9 J-Link Installation Licese Agreement



Select J-Link driver components. For the Choose destination option, select “Update existing installation”. Default Settings are recommended. Click "Install", as shown in Figure 3-10.

Figure 3-10 J-Link Components Selection



Click "Finish" when J-Link driver installation is completed, as shown in Figure 3-11

Figure 3-11 J-Link Installation Complete

Olimex debugging emulator driver software installation process

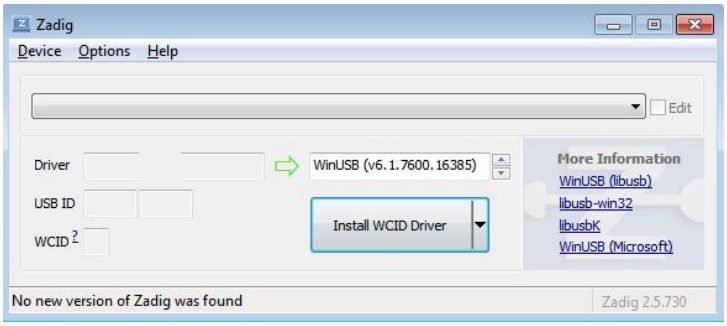
The Olimex debugging emulator is used by default as the software online debugging emulator for Gowin_PicoRV32 (or any other type of debugging emulator supported by the RiscV instruction set architecture processor).

Please download and install Olimex Debugging Emulator driver software online and keep your PC networked during the installation process.

To install the Olimex Debugging Emulator Driver software, please refer to the following steps:

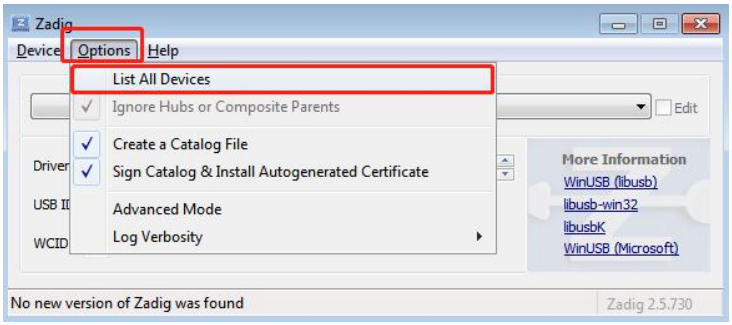
1. Please connect Olimex Debug Emulator USB Cable with PC.
2. Please double-click “zadig-2.5.exe” in the driver folder of GMD installation path. And then open Olimex Debugging Emulator Driver software, as shown in Figure 3-12.

Figure 3-12 Olimex Debugging Emulator Driver Software



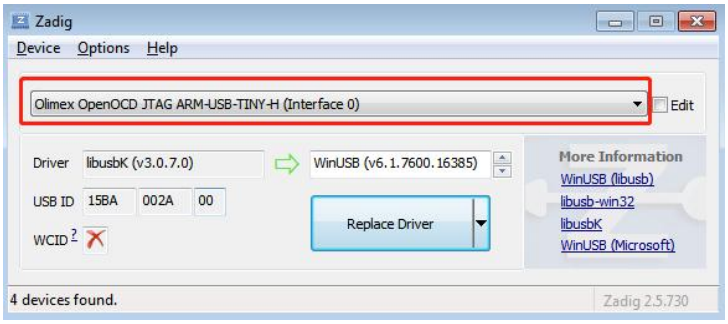
3. Select “Options > List All Devices” option in the menu bar, as shown in Figure 3-13.

Figure 3-13 Configure “List All Devices” Option



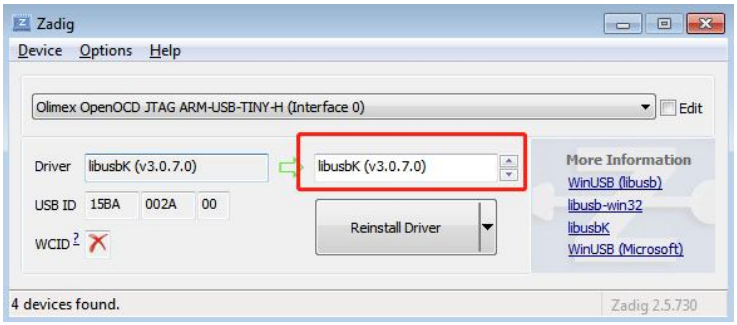
4. After selecting “List All Devices” option, all connected devices of the current PC can be seen. Select the device "Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 0)", as shown in Figure 3-14.

Figure 3-14 Configure Device Type as Interface 0



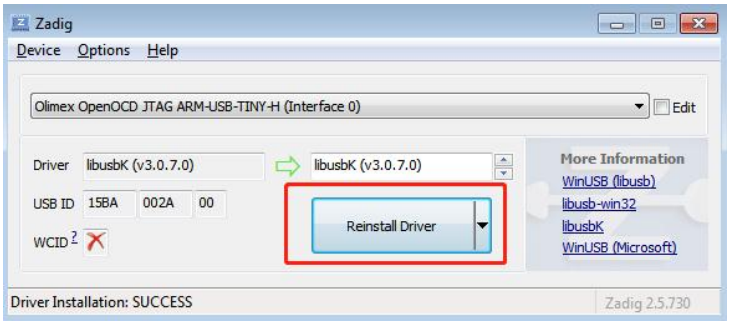
5. To configure the driver type options, select libusbK (v3.0.7.0), as shown in Figure 3-15.

Figure 3-15 Configure Driver Type



6. Click “Install Driver” or “Reinstall Driver” to begin installing the Olimex Debugger Emulator Driver software, as shown in Figure 3-16.

Figure 3-16 Install Olimex Debugging Emulator Driver Software



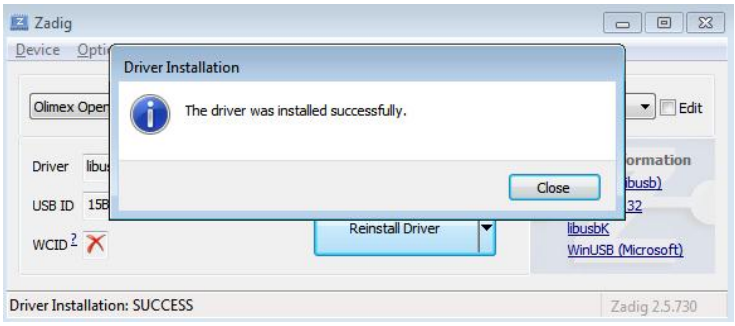
Note!

Please download and install Olimex Debugging Emulator driver software online

and keep your PC networked during the installation process.

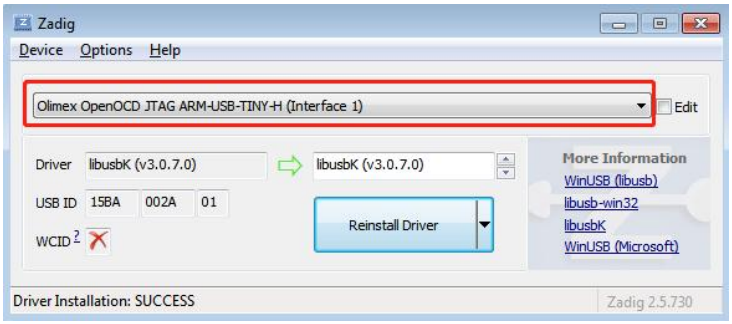
7. Please be patient with the Olimex Debugging Emulator Driver software installation process. After the Interface 0 device is successfully installed, the installation process is as shown in Figure 3-17.

Figure 3-17 Interface 0 Device Installation Successful



8. After "Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 0)" is installed successfully, please continue to select "Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 1)" in the list of devices, as shown in Figure 3-18.

Figure 3-18 Configure Device Type "Interface 1"

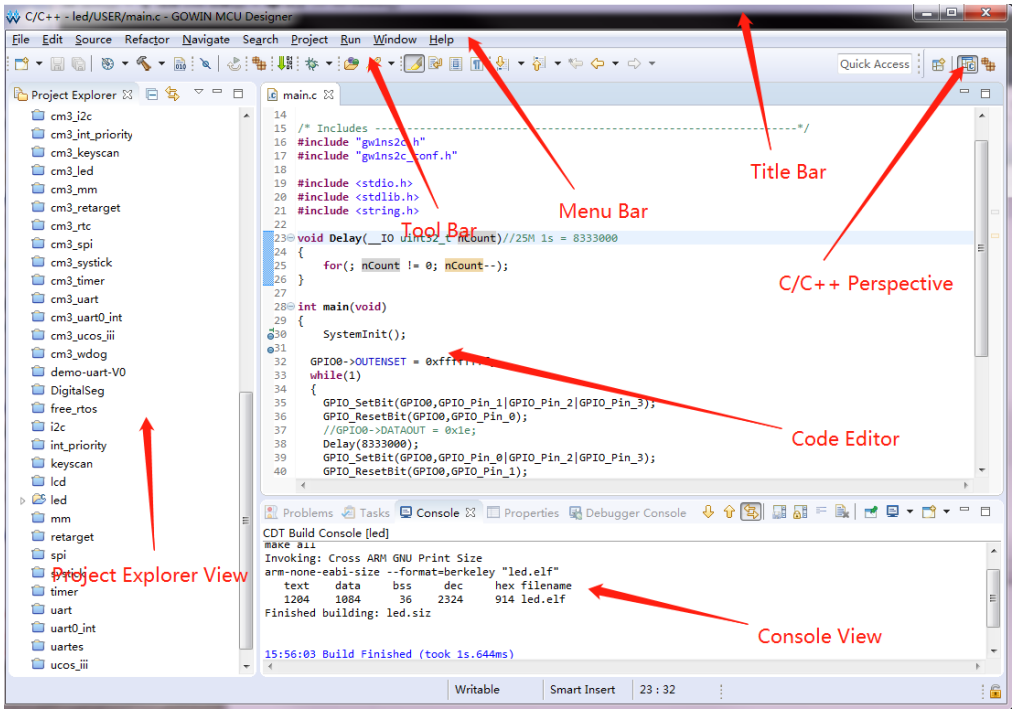


9. Repeat steps 5 to 7 to install the device "Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 1)".
10. After the devices "Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 0)" and "Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 1)" are installed successfully, "libusbK USB Devices > Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 0)" and "Olimex OpenOCD JTAG ARM-USB-TINY-H (Interface 1)" can be displayed successfully in the device management of PC.

4 User Interface

Figure 4-1 shows the GUI of GOWIN MCU Designer. It consists of the title bar, menu bar, tool bar, Project Explorer View, Code Editor, Console View, C/C++ Perspective, etc.

Figure 4-1 GUI



4.1 Title Bar

Title bar shows the current project path, name, and the name of the file that is currently open.

4.2 Menu Bar

Menu bar provides common used menus and start tools for projects, including the options of File, Edit, Source, Refactor, Navigate, Search, Project, Run, Window, and Help. See the following for details.

4.2.1 File

The file menu is as shown in Table 4-1.

Table 4-1 File Menu

Menu Item	Sub-menu Item	Shortcut	Functional Description
New	Makefile Project with Existing Code	Alt+Shift+N	Create C/C++ project containing makefile
	C++ Project		Create C++ project
	C Project		Create C project
	C/C++ Project		Create C/C++ project
	Project…		Create C, C++, C/C++project
	Convert to a C/C++ Project (Adds C/C++ Nature)		None-C/C++ project addsC/C++ features, C/C++ tool chain enable
	Source File		Create C/C++ source file
	Header File		Create C/C++ header file
	File from Template		Create C/C++ template file
	Class		Create C/C++ class structure
	Source Folder		Create a source folder
	Folder		Create a folder
Open File…	-	-	Open the existed file
Open Projects from File System…	-	-	Import the project wizard from file system
Close	-	Ctrl+W	Close the active editor
Close All	-	Ctrl+Shift+W	Close all editors
Save	-	Ctrl+S	Save the content of the active editor
Save As…	-	-	Save the content of the active editor under a new name
Save All	-	Ctrl+Shift+S	Save all editor's content and the unsaved changes
Revert	-	-	Revert the content of the active editor as the saved content
Move…	-	-	Move resources
Rename…	-	F2	Rename resources
Refresh	-	F5	Refresh selected elements based on local file system (If not started from the specified option, refresh all)
Convert Line Delimiters To	Windows	-	Windows system format
	Unix	-	Unix system format
Print…	-	Ctrl+P	Print the content of the active editor

Menu Item	Sub-menu Item	Shortcut	Functional Description
Switch Workspace	-	-	Switch workspace and restart workspace
Restart	-	-	Restart GMD IDE
Import…	-	-	Import the project wizard
Export…	-	-	Export the project wizard
Properties	-	Alt+Enter	Properities configuration
Exit	-	-	Exit GMD IDE

4.2.2 Edit

The edit menu is as shown in Table 4-2.

Table 4-2 Edit Menu

Menu Item	Shortcut	Functional Description
Undo	Ctrl+Z	Undo the previous step
Redo	Ctrl+Y	Redo the cancelled changes
Cut	Ctrl+X	Cut
Copy	Ctrl+C	Copy
Paste	Ctrl+V	Paste
Delete	Delete	Delete the selected text or element option
Select All	Ctrl+A	Select all the editor's content
Find/Replace	Ctrl+F	Find/Replace
Find Word	-	Find the selected word
Find Next	Ctrl+K	Find the next word of the current selected text
Find Previous	Ctrl+Shift+K	Find the previous word of the current selected
Incremental Find Next	Ctrl+J	Start incremental find mode to find the next
Incremental Find Previous	Ctrl+Shift+J	Start incremental find mode to find the previous
Add Bookmark…	–	Add bookmark to the current selected text or elements
Add Task…	–	Add user-defined task to the current selected text or elements
Show Tooltip Description	F2	Display the value of the current cursor position as floating instructions
Content Assist	Alt+/	Open content assist view at the current cursor position to display the auxiliary syntax sample of the programming code
Quick Fix	Ctrl+1	If the cursor is at the location of the problem, the content assist view will be opened and the possible corrections will be provided.
Parameter Hints	Alt+?	If the cursor is at the location of the

Menu Item	Shortcut	Functional Description
		referential parameters, the parameter information will be displayed as floating instructions
Set Encoding	-	Switch the current content coding

4.2.3 Source

The source menu is as shown in Table 4-3.

Table 4-3 Source Menu

Menu Item	Shortcut	Functional Description
Toggle Comment	Ctrl+7	Toggle comment on all lines containing the selected text of the current line
Add Block Comment	Ctrl+Shift+/	Comment on all blocks containing the selected text of the current line
Remove Block Comment	Ctrl+Shift+\	Remove the blocks containing the selected text of the current line
Shift Right	–	Increase indent in the selected line
Shift Left	Shift+Tab	Reduce indent in the selected line
Correct Indentation	Ctrl+I	Indent rule applying to the selected line
Format	Ctrl+Shift+F	Program code formatter can be used to format the current text selection
Add Include	Ctrl+Shift+N	Add include to the reference of the selected type
Organize Includes	Ctrl+Shfit+O	Add Include to the selected compilation organizes
Sort Lines	Ctrl+Shift+S	Sort lines according to the specified order
Implement Method…	–	The method of replacing or implementing the current type
Generate Getters and Setters…	–	Generate Getters and Setters for the field of the current line type
Surround With	Alt+Shift+Z	Evaluate all exceptions that must be caught for the selected statement

4.2.4 Refactor

The Refactor menu is as shown in Table 4-4.

Table 4-4 Refactor Menu

Menu Item	Shortcut	Functional Description
Rename…	Alt+Shift+R	Rename the selected element and update all the reference of the elements
Extract Local Variable	Alt+Shift+L	Create a new variable and specify it to the selected expression and replace the selected as the new variable's reference
Extract Constant…	Alt+C	Creates the static final field from the selected expression and replaces the field reference, rewriting to the other locations

Menu Item	Shortcut	Functional Description
		where the same expression occurs
Extract Function…	Alt+Shift+M	Create a new variable and specify it to the selected statement and replace the selected as the new variable's reference
Toggle Function	Alt+Shift+T	Move the selected function from the header file to the implementation file or return
Hide Method…	–	Hide Method…
Apply Script…	–	Apply the saved refactor list
Create Script…	–	Export the refactor list for later use
History…	–	Display the refactor history

4.2.5 Navigate

The Navigate menu is listed in Table 4-5.

Table 4-5 Navigate Menu

Menu Item	Sub-menu Item	Shortcut	Functional Description
Go Into	–	–	Set the view input to the current selected element
Go To	Back	–	Back: Set the view input to the previous input
	Forward	–	Forward: Set the view input to the next input
	Up One Level	–	Up One Level: Set the current view input to the input parent element
	Resource…	–	Browse to find resources and display them in the current view
Open Declaration	–	F3	Display the Open Declaraction view to open a declaration in the editor
Open Type Hierarchy	–	F4	Parse the element referenced by the current program code options and open it in the Type Hierarchy view
Open Call Hierarchy	–	Ctrl+Alt+H	Open Call the element referenced by the current program code options and open it in the Call Hierarchy view
Open Include Browser	–	Ctrl+Alt+I	Display Include Browser
Open Element…	–	Ctrl+Shift+T	Display the Open Element view to open an element in the editor
Open Type In Hierarchy…	–	Ctrl+Shift+H	Display the Open Type view to open a type in the editor and Type Hierarchy view
Open Element in Call Hierarchy…	–	–	Display the Open Element view to open an element in the editor and Call Hierarchy view
Open Resource…	–	Ctrl+Shift+R	Display all resources

Menu Item	Sub-menu Item	Shortcut	Functional Description
Show In	Problem Details	Alt+Shift+W	Display Problem Details view
	Include Browser		Display Include Browser view
	C/C++ Projects		Display C/C++ Projects view
	Project Explorer		Display Project Explorer view
	System Explorer		Display System Explorer view
	Properties		Display Properties view
Quick Outline	-	Ctrl+O	Open quick outline for the current selected type
Next Annotation	-	Ctrl+.	Navigate to the next item
Previous Annotation	-	Ctrl+,	Navigate to the previous item
Last Edit Location	-	Ctrl+Q	Display the last edit location
Go to Line…	-	Ctrl+L	Open a dialog box to enter the line number to indicate which line the editor should move
Back	-	Alt+Left	Navigate to the previous resource that previously viewed in the editor
Forward	-	Alt+Right	Navigate and restore the result of previous commands

4.2.6 Search

The search menu is as shown in Table 4-6.

Table 4-6 Search Menu

Menu Item	Sub-menu Item	Shortcut	Functional Description
Search…	-	Ctrl+H	Search
File…	-	-	Search File
C/C++…	-	-	Search C/C++
Remote…	-	-	Search Remote
Text	Workspace	Ctrl+Alt+G	Search for the selected element throughout the workspace
	Project	-	Search for the selected element in the projects that contains the selected element
	File	-	Search for the selected element in the files that contains the selected element

Menu Item	Sub-menu Item	Shortcut	Functional Description
	Working Set…	-	Search for the selected element in the working set

4.2.7 Project

The project menu is as shown in Table 4-7.

Table 4-7 Project Menu

Menu Item	Sub-menu Item	Shortcut	Functional Description
Open Project	-	-	Select to open the closed items
Close Project	-	-	Close the currently selected items
Build All	-	Ctrl+B	Perform incremental compilation of all items in the workspace
Build Configurations	Set Active	-	SetRelease or Debug as active
	Manage…	-	Manage configuration
	Build by Working Set	-	Set to build the working set
	Set Active by Working Set	-	Set Working Set as active
	Manage Working Sets…	-	Manage Working Sets
Build Project	-	-	Perform incremental compilation on the selected projects
Build Working Set	Select Working Set	-	Perform incremental building of all projects in the Working Set
Clean…	-	-	Clean building results
Build Automatically	-	-	Build all projects in the workspace automatically
Build Targets	Create…	-	Create
	Build…	Shift+F9	Build
	Rebuild Last Target	-	Rebuild the last target
Properties	-	-	Properities configuration

4.2.8 Run

The run menu is as shown in Table 4-8.

Table 4-8 Run Menu

Menu Item	Shortcut	Functional Description
Programmer	-	Start Gowin Programmer
Debug	F11	Start Debugging mode
Debug History	–	Use the last debug configuration in the history
Debug As	–	A shortcut to start the debug dialog box
Debug Configuration…	–	Configure debug options and start debugging
Toggle Breakpoint	Ctrl+Shift+B	Add or remove breakpoints based on the current content
Toggle Line Breakpoint	–	Add or remove breakpoints of current executable code line
Toggle Method Breakpoint	–	Add or remove breakpoints based on the current binary method
Toggle Watchpoint	–	Add or remove watchpoints of current field
Skip All Breakpoints	–	Skip all breakpoints in the workspace
Remove All Breakpoint	Ctrl+Alt+B	Remove all breakpoints in the workspace Permanently
Breakpoint Types	–	Configure breakpoint types （C/C++ Breakpoint or C/C++ Dynamic Printf）

4.2.9 Window

The window menu is as shown in Table 4-9.

Table 4-9 Window Menu

Menu Item	Sub-menu Item	Shortcut	Functional Description
New Window	–	–	Open a new workbench window with the same perspective as the current one
Edit	Toggle Split Editor (Horizontal)	Ctrl+_	Open a new copy of the active editor horizontally
	Toggle Split Editor (Vertical)	Ctrl+(	Open a new copy of the active editor vertically
	Clone	–	Copy a new copy of the active editor
Appearance	Hide Toolbar	–	Hide Tool bar
	Toggle Full Screen	Alt+F11	Full screen toggle
Show View	Build Targets	–	Display the Build Targets view in the active perspective
	C/C++ Projects	–	Display C/C++ Projects view in the active perspective

Menu Item	Sub-menu Item	Shortcut	Functional Description
	Console	Alt+Shift+Q,C	Display Console view in the active perspective
	Documents	-	Display documents in the active perspective
	Include Browser	-	Display Include Browser view in the active perspective
	Navigator	-	Display Navigator in the active perspective
	Outline	Alt+Shift+Q,O	Display Outline in the active perspective
	Problem Details	-	Display Problem Details view in the active perspective
	Problems	Alt+Shift+Q,X	Display Problem view in the active perspective
	Project Explorer	-	Display Problem Explorer view in the active perspective
	Properties	-	Display Properties view in the active perspective
	Search	Alt+Shift+Q,S	Display Search view in the active perspective
	Tasks	-	Display Tasks view in the active perspective
	Other…	Alt+Shift+Q,Q	Open all views
Perspective	Open Perspective	-	Open the perspective of sub-menus
	Customize Perspective …	-	Change the visibility of various elements in the active perspective
	Save Perspective As…	-	Save the active perspective as a new name view
	Reset Perspective…	-	Remove the user-defined perspectives
	Close Perspective	-	Close the active perspective
	Close All Perspectives	-	Close all perspectives
Navigation	Show System Menu	Alt+-	Show system menu
	Show View Menu	-	Show vew menu
	Quick Access	Ctrl+3	Open quick access
	Maximize Active View or Editor	Ctrl+M	Maximize active view or editor
	Minimize Active View or Editor	-	Minimize active view or editor
	Active Editor	F12	Start editor
	Next Editor	Ctrl+F6	Start the next editor in the list of recently used editors
	Previous Editor	Ctrl+Shift+F6	Start the previous editor in the list of recently used editors
	Switch to Editor…	Ctrl+Shift+E	Switch to the open editor

Menu Item	Sub-menu Item	Shortcut	Functional Description
	Next View	Ctrl+F7	Start the next view in the list of recently used views
	Previous View	Ctrl+Shift+F7	Start the previous view in the list of recently used views
	Next Perspective	Ctrl+F8	Start the next perspective in the list of recently used perspectives
	Previous Perspective	Ctrl+Shift+F8	Start the previous perspective in the list of recently used perspectives
Preferences	-	-	Configure the preferences for the active workspace

4.2.10 Help

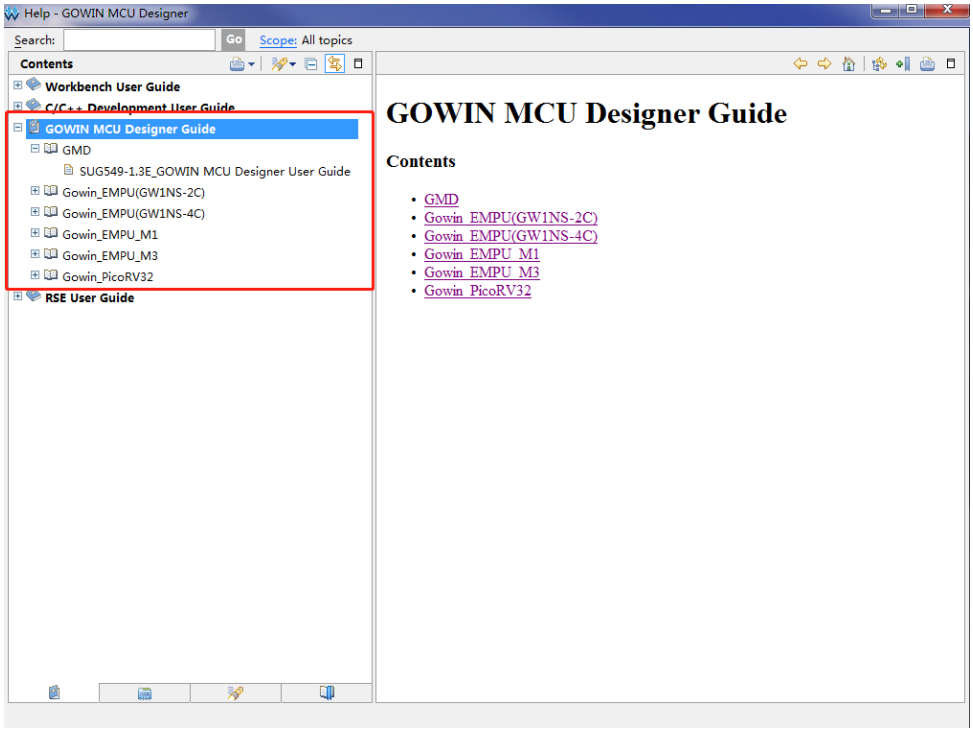
The Help menu is as shown in Table 4-10.

Table 4-10 Help Menu

Menu Item	Shortcut	Functional Description
Welcome	-	Display the welcome page
Help Contents	-	Display the help page
Search	-	Search the help contents
Show Contextual Help	-	Show the help contents in related topics
Show Active Keybindings…	Ctrl+Shift+L	Show active keybindings
Tips and Tricks…	-	Tips and Tricks
Cheat Sheets…	-	Cheat Sheets…
License Content	-	Display license content
About Gowin MCU Designer		Display GMD information

Click Help > Help Contents on the menu bar to view the user manuals for GMD, Gowin_EMPU (GW1NS-2C), Gowin_EMPU (GW1NS-4C), Gowin_EMPU_M1, Gowin_EMPU_M3, and Gowin_PicoRV32, as shown in Figure 4-2.

Figure 4-2 Help Contents



4.3 Tool Bar

Tool bar provides quick accesses to some commonly used functions, mainly including Build, Run, Stop, New Wizards, Save, Save All, Manage, Restart, Debug, Search,etc. as shown in Table 4-11.

Table 4-11 Tool Bar Options

Tool Bar Options	Icon	Functional Description
New		New a project or a file
Save		Save the content of the active editor
Save All		Save the content of the active editor under a new name
Manage Configurations		Manage configurations (Debug and Release)
Build…		Perform incremental compilation on the selected projects
Build All		Perform incremental compilation of all items in the workspace
Skip All Breakpoints		Skip all breakpoints in the workspace during debugging
Restart		Restart GMD IDE
Make the C/C++ Packs perspective visible		Load the device information of ARM processor
Debug		Debugging
Programmer		Start Programmer.
Open Element		Display the Open Element view to open an element in the editor

Tool Bar Options	Icon	Functional Description
Search		Search
Toggle Mark Occurrences		Toggle mark occurrences of C/C++ editor
Toggle Work Wrap		Toggle Work Wrap
Toggle Block Selection Mode		Toggle Block Selection Mode
Show Whitespace Characters		Show Whitespace Characters
Next Annotation		Navigate to the next item
Previous Annotation		Navigate to the previous item
Last Edit Location		Display the last edit location
Back		Navigate to the previous resource that previously viewed in the editor
Forward		Navigate and restore the result of previous commands

4.4 Project Area

The project area shows projects and the related files. Users can check or change the project device information, user design files, etc.

4.5 Source File Editing Area

Users can view and edit source files in the source file editing area.

The newly-built or opened files from the File window will be displayed in the source file editing area.

To close the file currently displayed, click “File > Close” on the menu bar or click on the icon "  " that appears in the upper-right of the file editing area.

To close all the files in the file editing area, click "File > Close All" on the menu bar.

4.6 Information Output area

The information output area displays the processing information when the software is running. Users can verify different outputs by manually switching between the tabs:

- Console
- Problems

5 License Management

5.1 License Application

When users start GOWIN MCU Designer for the first time after it is installed, the Designer prompts for the License installation and registration. Please contact Gowin FAE or the local office to apply for a License before starting GOWIN MCU Designer for the first time.

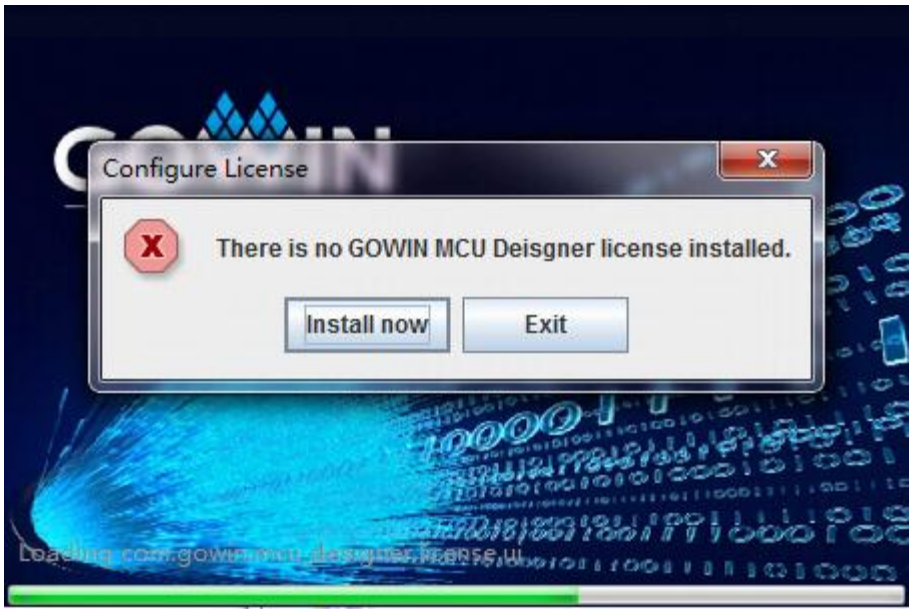
The information as follows is required to apply for a license:

- MAC address (Mandatory)
- Computer name (Optional)

5.2 License Installation

GOWIN MCU Designer prompts for the License installation and registration after it is started for the first time, as shown in Figure 5-1.

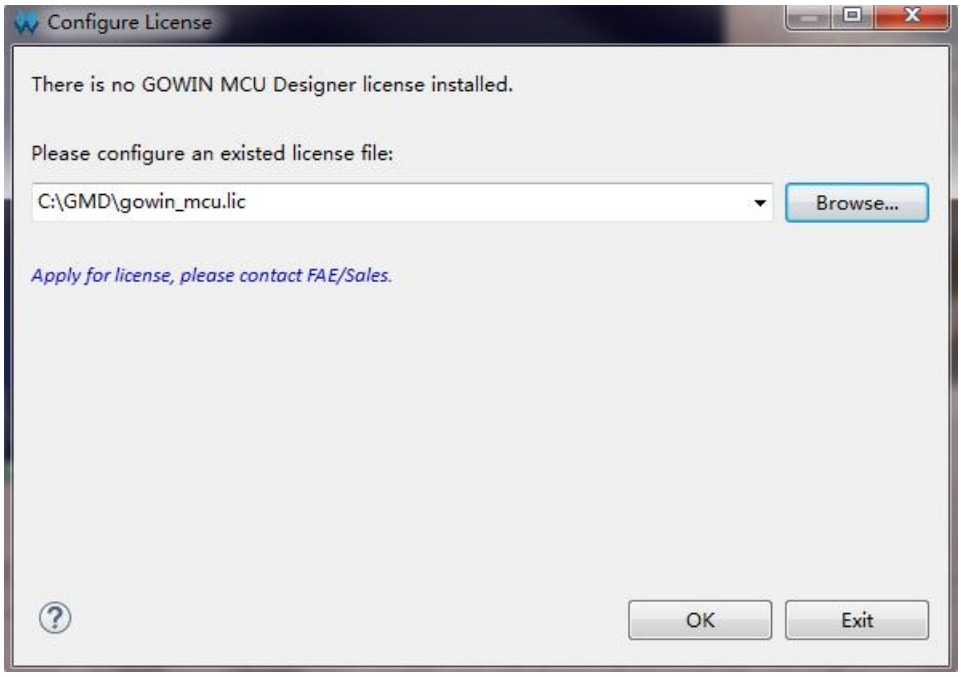
Figure 5-1 A Starting License Prompt



If users have no License, click "Exit" and contact Gowin FAE or the local office to apply for a License.

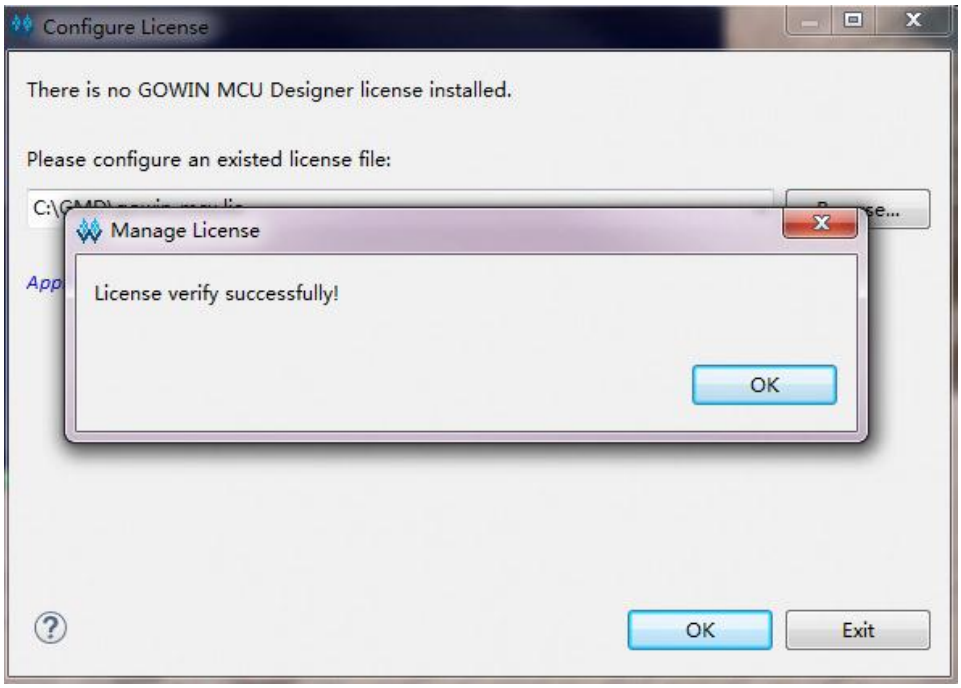
If user have the License, click "Install now", import the License file, and click "OK", as shown in Figure 5-2.

Figure 5-2 License Installation



As shown in Figure 5-3, when the License installation is complete, GOWIN MCU Designer prompts "License verify successfully!". Click "OK", and GOWIN MCU Designer starts.

Figure 5-3 License Verification



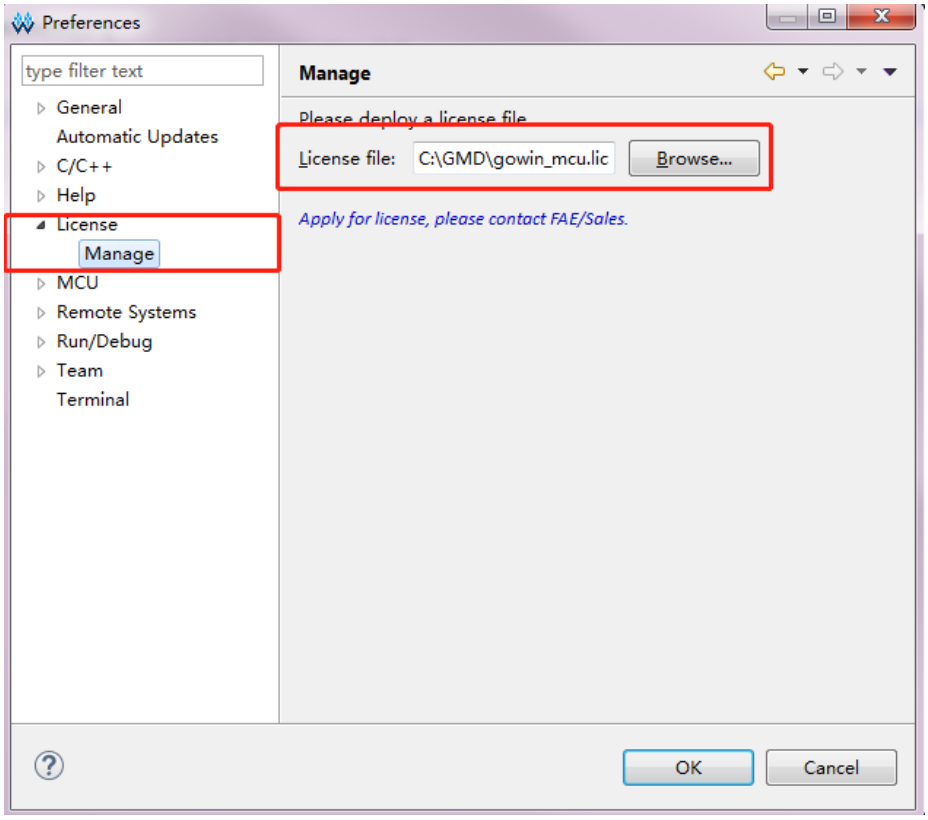
5.3 License Management

Before the License is due to expire, users can apply for a new License and reinstall.

Click Window > Perferences on the menu bar to open the

"Perferences" view. Select "License > Manage" and import the new License file, as shown in Figure 5-4.

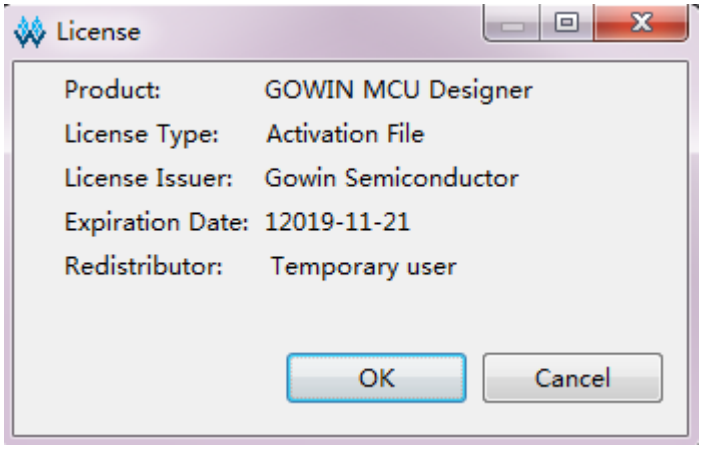
Figure 5-4 License Management



5.4 License Check

After the License is installed and verified, click Help > License Content on the menu bar to check the installed License information, as shown in Figure 5-5.

Figure 5-5 License Check



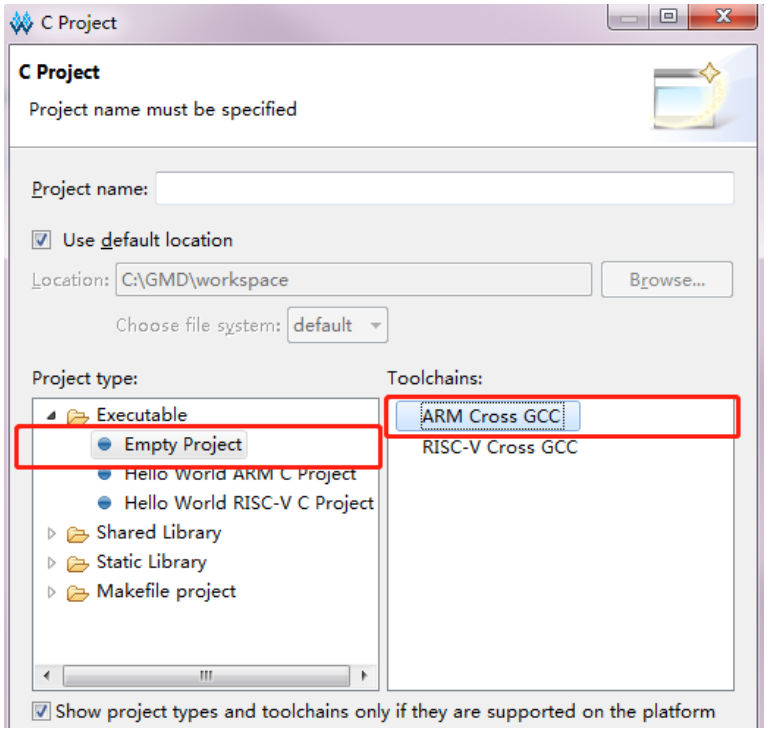
6 Usage

6.1 Compilation Toolchain Configuration

6.1.1 ARM MCU Compilation Toolchain Configuration

When creating an ARM MCU project, click File>New>C Project or New>C Project on the tool bar to open the dialog box “new C Project”. Select "Empty Project" in Project type. And select "ARM Cross GCC" in Toolchains, as shown in Figure 6-1.

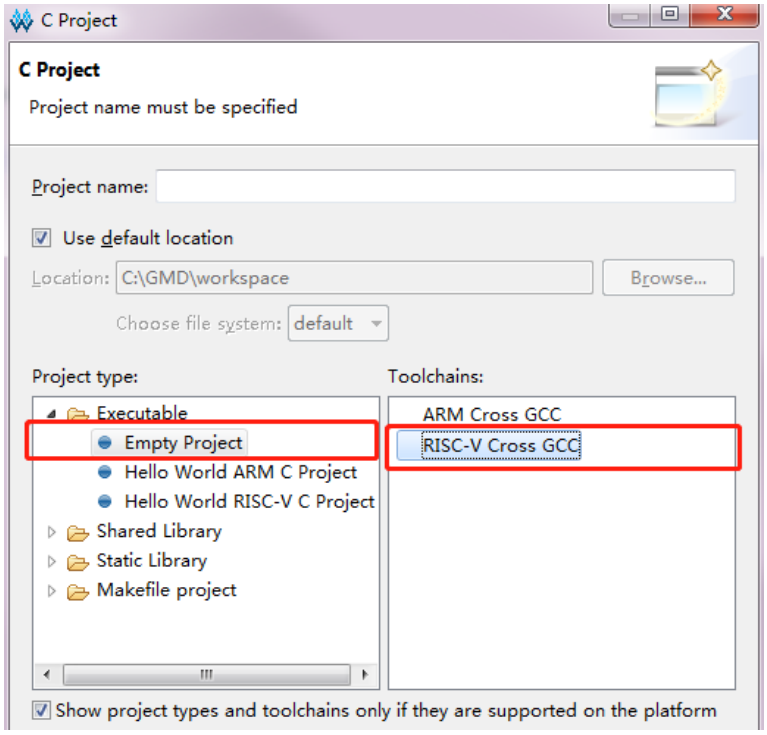
Figure 6-1 ARM MCU Compilation Toolchain Configuration



6.1.2 Risc-V MCU Compilation Toolchain Configuration

When creating a RISC-V MCU project, click “File>New>C Project” or “New>C Project” on the tool bar to open the dialog box “new C Project”. Select "Empty Project" in Project type. And select "RISC-V Cross GCC" in Toolchains, as shown in Figure 6-2.

Figure 6-2 RISC-V MCU Compilation Toolchain Configuration



6.2 Reference Manual

Please refer to the following manuals for the usage information:

- IPUG519, Gowin_EMPU(GW1NS-2C) IDE Software Reference Manual
- IPUG536, Gowin_EMPU_M1 IDE Software Reference Manual
- IPUG928，Gowin_EMPU(GW1NS-4C) IDE Software Reference Manual
- IPUG919，Gowin_EMPU_M3 IDE Software Reference Manual
- IPUG910，Gowin_PicoRV32 IDE Software Reference Manual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