Thank you for choosing MIKROE!

We present you the ultimate debugger and programmer over USB/WiFi solution for embedded development. Elegant on the surface, yet extremely powerful on the inside, we have designed it to inspire outstanding achievements. And now, it’s all yours.

Enjoy premium.
# Table of contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>1. Installing CODEGRIP Suite</td>
<td>6</td>
</tr>
<tr>
<td>2. CODEGRIP</td>
<td>8</td>
</tr>
<tr>
<td>2.1 USB connectivity</td>
<td>9</td>
</tr>
<tr>
<td>2.2 WiFi connectivity</td>
<td>9</td>
</tr>
<tr>
<td>2.3 Target connector</td>
<td>10</td>
</tr>
<tr>
<td>2.4 CODEGRIP adapters</td>
<td>11</td>
</tr>
<tr>
<td>2.5 LED indicators</td>
<td>13</td>
</tr>
<tr>
<td>3. CODEGRIP Link structure</td>
<td>14</td>
</tr>
<tr>
<td>3.1 Link types</td>
<td>14</td>
</tr>
<tr>
<td>3.2 Link states</td>
<td>14</td>
</tr>
<tr>
<td>4. CODEGRIP Suite overview</td>
<td>16</td>
</tr>
<tr>
<td>4.1 Menu section</td>
<td>17</td>
</tr>
<tr>
<td>4.2 Menu item section</td>
<td>17</td>
</tr>
<tr>
<td>4.3 Shortcuts bar</td>
<td>17</td>
</tr>
<tr>
<td>4.4 Status bar section</td>
<td>18</td>
</tr>
<tr>
<td>5. CODEGRIP Suite explained</td>
<td>19</td>
</tr>
<tr>
<td>5.1 Target MCU</td>
<td>19</td>
</tr>
<tr>
<td>5.2 CODEGRIP</td>
<td>26</td>
</tr>
<tr>
<td>5.3 POWER</td>
<td>36</td>
</tr>
<tr>
<td>5.4 OPTIONS</td>
<td>37</td>
</tr>
<tr>
<td>5.5 HELP</td>
<td>38</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>40</td>
</tr>
<tr>
<td>6.1 Target programming errors</td>
<td>40</td>
</tr>
<tr>
<td>6.2 Licensing errors</td>
<td>41</td>
</tr>
</tbody>
</table>
CODEGRIP for AVR is a unified solution, designed to perform programming and debugging tasks on a range of different microcontroller devices (MCUs) based on the AVR architectures from Microchip®. By bridging differences between various MCUs, it allows a huge number of MCUs to be programmed and debugged. More MCUs might be added in the future, along with some new functionalities.

Thanks to some advanced and unique features such as wireless connectivity and USB-C connector, the task of programming of various AVR based microcontrollers becomes seamless and effortless, providing users with both the mobility and the complete control over the microcontroller programming and debugging process. The USB-C connector offers improved performance and reliability, compared to traditionally used USB Type A/B connectors. Wireless connectivity redefines the way the development board can be used.

The graphical user interface (GUI) of the CODEGRIP Suite is clear, intuitive, and easy to learn, offering a very pleasant user experience. The embedded HELP system provides detailed guidelines for every aspect of the CODEGRIP Suite.
1. Installing CODEGRIP Suite

The installation process is easy and straightforward.
Download CODEGRIP Suite software application from the link [www.mikroe.com/setup/codegrip](http://www.mikroe.com/setup/codegrip) and follow the steps below.

1. Start the installation

2. Select the destination folder

3. Select the components to install

4. License agreement
5. Select the start menu shortcuts

6. Start the installation process

7. Installation progress

8. Finish the installation process
The CODEGRIP device offers a set of unique and innovative functionalities, some of which have never been used before on a similar device. These functionalities include wireless programming and debugging, power monitoring, and more.

The CODEGRIP device comes in two different types: as a stand-alone device and an integrated on-board module. This manual will be focused on the stand-alone CODEGRIP device.

In order to better understand how this device is operated, this chapter will give you a brief overview of its basic hardware functions.
2.1 USB connectivity

The USB-C connector is the latest upgrade of the conventional USB A/B type connectors, typically found on most personal computers today. The USB-C connector has many advantages over the USB type A/B connector such as the completely symmetrical design which reduces the possibility of the connector misalignment and the damage it might cause, higher current capability, and more. However, if there is not appropriate USB-C connector on the host PC, a USB-C cable adapter can be used.

2.2 WiFi connectivity

The CODEGRIP device can be linked with the CODEGRIP Suite over the WiFi network, allowing it to program and debug the target MCU wirelessly. This is a revolutionary new feature, which allows some unique usage scenarios, currently not available on any other programming/debugging solution in the world. The WiFi connectivity option offers a complete autonomy of the development system. Running a toxic gas sensor application while debugging the firmware in real time, programming it with a new firmware during exposure, having sensor responses collected and logged remotely from several different base points, debugging drone firmware while it is in mid-air... This is just a simple example of what CODEGRIP can offer.

The WiFi module on the CODEGRIP device has an integrated chip antenna, which allows good WiFi reception. However, if a stronger WiFi signal is required, the CODEGRIP device offers an SMA connector for an external WiFi antenna.

The WiFi link can be protected by a password, or by the MAC address filtering option.

To use the WiFi functionality, a separate registration code is required. It can be bought from the official Mikroe online store www.mikroe.com
The CODEGRIP device is equipped with the connector used to interface the device with the target MCU. The connector allows it to perform programming and debugging operations, to provide the power supply for the target MCU, and to be used as the power input when the CODEGRIP device is powered from the connected development board.

On the bottom of the CODEGRIP device there is the sticker which contains additional information.
- Supported MCU family/architecture
- Unique serial number
- Unique WiFi MAC address

### CODEGRIP firmware

The CODEGRIP device is based on the powerful 32-bit MCU, which utilizes a complex firmware to provide all the required functionalities. The firmware will be continuously improved so that additional optimizations, functions, and support for new MCU families might be added in the future. Therefore, the complete CODEGRIP programming environment is designed so that the firmware upgrade process is effortless and easy.

**NOTE** When the connected host board provides power to the CODEGRIP device, CODEGRIP input voltage must be in range 2.5V to 10V.
2.4 CODEGRIP adapter

ISP/JTAG/PDI/UPDI programming/debugging headers may vary across different hardware applications. To ensure compatibility with various header configurations there is a set of different adapters available as an additional purchase option.
2.5 LED indicators

There are five LED indicators on the CODEGRIP device, used to indicate different states of the device, providing visual feedback to the user.

- **USB-LINK**: Indicates that the connection has been established via USB.
- **NET-LINK**: Indicates that the connection has been established via WiFi.
- **ACTIVE**: Blinking LED indicates that the CODEGRIP device is in the bootloader mode. Steady ON LED state indicates the normal operation of the CODEGRIP device.
- **DATA**: Indicates the data transfer between the target MCU and the CODEGRIP device.
- **POWER**: Indicates the presence of the power supply.
3. CODEGRIP link structure

CODEGRIP Suite can detect multiple CODEGRIP devices. In addition, a single CODEGRIP device can be operated by multiple software applications. To avoid any ambiguity, CODEGRIP utilizes the concept of links.

CODEGRIP Suite uses a link to the specific CODEGRIP device, in order to send commands and receive responses. The link can be created, opened, and destroyed by the user, employing some specific functions of CODEGRIP Suite.

Based on the link and its state, CODEGRIP Suite can always unambiguously know which CODEGRIP device to use, and if the specific CODEGRIP device is currently available. A single CODEGRIP device can have links to multiple CODEGRIP Suite applications, while CODEGRIP Suite can have a link to only a single CODEGRIP device at time. Still, it can easily switch the link to any CODEGRIP device detected during the scanning process.

3.1 Link types

Depending on what type of interface is used to establish the link, there are two types of links available: the USB link, and the WiFi link.

3.2 Link states

Each link has several different states recognized by the CODEGRIP Suite.

The link is **Closed**: the CODEGRIP device is not available over the communication interface (USB or WiFi). Either it is disconnected, nonresponsive, turned OFF, or otherwise unavailable.

The link is **Available**: the CODEGRIP device is available over the communication interface (USB or WiFi). Communication packets can reach the CODEGRIP device, and it is able to send back the response.

The link is **Blocked**: this state indicates that the link was blocked because the specific CODEGRIP device is busy servicing another link.

When CODEGRIP Suite actively uses the link for issuing commands to a linked CODEGRIP device, other applications linked to the same CODEGRIP device will have their links in a blocked state. As soon as the task is complete, those links will revert to the available state.

The indicator showing the current state is visible at the status bar at the bottom of the Suite. More detailed description about the Shortcut bar commands find in the Chapter 4.

**NOTE**

USB link is the primary link and it has the highest priority. Some operations, such as the firmware update, are exclusively used with the USB link. When the USB link is active, all the WiFi links to that specific CODEGRIP device will be forced to a closed state.
4. CODEGRIP Suite overview

The graphical user interface (GUI) of CODEGRIP Suite is clear, intuitive, and easy to use, which ensures a fluid workflow. The main window is divided into several sections, which are used to display and organize all information, tools, and options in a consistent and comprehensible manner.

Besides the very informative Help system, CODEGRIP Suite also offers a short description for the most of its functionalities in a form of a hovering tooltip. It is enough to keep the mouse hovering above the specific graphical element for a while, and a small tooltip will pop up, providing some basic info.

The following chapter explains the GUI layout and its main elements. GUI of the CODEGRIP Suite can be divided into several sections:

1. Menu section
2. Menu Item section
3. Shortcut bar
4. Status bar
4.1 Menu section

As already mentioned, all Menu buttons are located in the Menu section (1) of the CODEGRIP Suite GUI. By clicking a Menu button, one or more Menu items are unfolded. Menu items are grouped by the type of the function they are related to. For example, clicking the CODEGRIP Menu button will unfold Scanning, Configuration, and License Menu items. All these Menu items are related to configuring and working with CODEGRIP devices, and therefore they are grouped under the CODEGRIP Menu button.

4.2 Menu item section

When a Menu item is clicked, the Menu item section (2) will display all the GUI elements available for that specific Menu item. For example, if the Programming Menu item is clicked, the Menu item section of the GUI will show some basic information about the target and controls for MCU programming tasks. Each Menu item will display its own set of GUI elements in the Menu item section of the GUI interface when clicked.

4.3 Shortcuts bar

The Shortcuts bar (3) is another persistent section of the CODEGRIP Suite GUI, containing controls for the most commonly used commands. It appears on the top of the Menu item section, just below the title bar. The only Menu item that does not include the Shortcuts bar is the Programming Menu item since all the shortcut commands are already included there.

Icons on the Shortcuts bar are used to speed up the workflow, providing easy access to a set of commands from within any Menu item of CODEGRIP Suite. This is basically a set of commands otherwise found under the Programming Menu item, including the most commonly accessed CODEGRIP commands: WRITE command, DETECT command and VERIFY command, along with the interface used to select .hex or .bin file.

More detailed description about the Shortcut bar commands find in the Chapter 5.
4.4 Status bar section

The Status bar [4] is located at the very bottom of the GUI and it is used to provide persistent visual feedback about the CODEGRIP link status. A set of indicators along with a related text field allowing the user to always know the status of the CODEGRIP link.

Selected Device: This text field is used to either display the name of the CODEGRIP device which is currently linked to CODEGRIP Suite. If the link has been destroyed by the user, or has not been created yet, the message “None” will be displayed instead. Hovering the mouse above the message will highlight it (yellow), indicating that it is clickable.

Two actions will be performed when clicking the message in the Selected Device field:

- If the message “None” is displayed, the Scanning Menu item will be activated if clicked.
- If there is a CODEGRIP device name displayed in this field, the Configuration Menu item will be activated if clicked.

Link status indicator: provides visual feedback about the status of the link. When working with multiple devices, it is sometimes useful to have visual indication of the device which is currently linked with the CODEGRIP Suite. When the Link status indicator is clicked, the linked device will respond by blinking its ACTIVE LED.

Color-coding scheme examples:

- 🚶‍♂️ 📡 the link is closed
- 🚶‍♂️ 📡 the link is available
- 🚶‍♂️ 📡 the link is blocked

Update availability indicator: As a part of the startup procedure, CODEGRIP Suite checks if there is a software update available. If a new update is available, it will display a notification icon on the status bar, indicating that there is a new version of CODEGRIP Suite available for download. This notification icon can be suppressed by configuring the options found in the OPTIONS/General Menu item.
5. CODEGRIP Suite explained

As already mentioned, each Menu button contains one or more related Menu items, and each Menu item contains its own set of tools and options, displayed in a form of various GUI elements on the Menu item section. This chapter provides detailed information on these tools and options.

5.1 Target MCU

Menu items used to interact with the target MCU (the selected MCU upon which the CODEGRIP device performs various programming/debugging tasks) are folded under this Menu button. The Menu button is labeled dynamically, according to the selected target MCU. This allows the user to always be aware of which MCU is set as the target MCU, regardless of the currently selected Menu item. There are three Menu items available, folded under this Menu button: Programming, and Options.
5.1.1 Programming

The Programming Menu item displays all the commands, parameters, and other information, related to the programming process itself. When the Programming Menu item is clicked, a quick summary of the selected programming options is displayed on the top of the Menu item section, grouped under a label which displays the name of the target MCU:

- the selected MCU vendor, the programming protocol, connection speed, the flash size of the target MCU, the connection type, and the reset type.

Below is the interface used to select and display the program file .bin or .hex file, ready to be uploaded to the target MCU or examined by using a set of options, accessible by clicking the FLASH button.

There is also the programming interface, composed of a set of buttons, used to perform various programming commands. These commands will be explained in this chapter.

On the bottom of the Menu item section, there is a panel which displays different status messages during the programming process, along with the progress bar. Each command returns a message response and displays it on this panel. In general, messages displayed with green letters indicate a successful execution, while messages displayed with red letters indicate an error during the execution of specific command.

Troubleshooting steps required for resolving of issues reported during the execution of the programming commands are listed at the end of this manual, in the Troubleshooting section.
**SOURCE**

The name of the currently loaded .hex or .bin file is displayed in this field. This file contains the program data that will be uploaded to the target MCU. Next to this textbox is a browse button, which opens a file selection dialog window, used to browse the .hex or .bin file.

The source file selection dialog window can also be opened by using the keyboard shortcut [Ctrl+O]. Finally, the drag & drop functionality from the host OS is also supported by CODEGRIP Suite.

The right-click menu is supported. There are Copy File Name, Copy Full Path, and Remove File options.

The content of the loaded source file can be viewed using the FLASH button.

**DETECT button**

DETECT button is used to identify the MCU.

**RESET button**

RESET button will perform a reset of the target MCU.

**WRITE button**

WRITE button performs programming of the target MCU. It will upload the program from the loaded source file to the target MCU, using the programming protocol, speed and other parameters found in the TARGET/Options Menu item. Before memory is written, the target MCU flash will be erased.

**VERIFY button**

VERIFY button is used to compare the content of the loaded source file with the content of the target MCU memory.

**ERASE button**

The ERASE button is used to erase the entire flash memory content of the target MCU.

**BLANK button**

The BLANK button is used to verify the status of the target MCU memory. If memory is blank (i.e. memory was erased by the ERASE command), an appropriate message will be displayed.

The functionality of these commands can be further adjusted by configuring the Verification Type settings, found in the OPTIONS/General Menu item.
**READ button**

READ button performs a reading of the target MCU flash memory content. The content of the memory is then available for the FLASH button related functions.

**FLASH button**

FLASH button opens the Memory View window which displays the table view of the memory content. There are two tabs in this window: **Memory View** and **Loaded Source**. The Memory View tab displays the target MCU memory content. The Loaded Source tab displays the content of the loaded .bin or .hex source file. Note that if there is no source file loaded, the Loaded Source tab will reflect this condition by changing its label to “File is not loaded”. Cell size can be configured to show 8-bit, 16-bit or 32-bit data per cell, by using the icon.

**CODE, DATA, CONFIG, USER ID buttons**

Display corresponding type of memory. If selected MCU contain only CODE memory these buttons will not be visible.

The last column displays the data converted to ASCII characters.

Data listed on both the Memory View and Loaded Source tabs can be exported as a .bin or .hex file. Clicking the SAVE button located on the bottom right corner of the Memory View window will open a new file dialog, allowing to enter the filename and the path for the exported file.

**Goto Address**

By using the text box, you will jump to your specify memory location. If the specified value is not a valid address, the corresponding action will be disabled.

**Find**

This function is used to search for an occurrence of the value specified in the textbox.
5.1.2 Options

The Options Menu item displays a set of options, which are used to select and configure the target MCU.

**Vendor**

Options: a list of supported MCU vendors.

The Vendor dropdown menu allows the MCU vendor to be selected. If All is selected the vendor filtering will not be applied.

**MCU**

Options: a list of all the supported MCUs from the selected vendor. This dropdown menu allows the target MCU to be selected. It contains a list of MCUs available from the selected vendor.

Typing in this textbox will dynamically filter the MCU list, showing only the MCU names containing the characters typed so far.

**Protocol**

Options: UPDI, PDI, JTAG, ISP

This dropdown menu is used to select the programming protocol.

**Speed**

Various speeds in range from 16 KHz to 8 MHz may be available depending of the target device. This dropdown menu allows the link communication clock frequency [communication speed] to be selected.

**Programming Type**

Options: Regular, 12V Entry

Devices may have different ways of entering into programming mode. For a detailed explanation of the programming type, please consult the datasheet or the reference manual of the specific MCU. using Vdd only, without high voltage.
**Target Browse window**

By clicking the browse button next to the MCU selection dropdown menu, the Target Browse window will pop up. The Target Browse window contains a vendor drop down menu and MCU textbox. Typing in this textbox will dynamically filter the MCU list, showing only the MCU names that contain the characters typed so far.

By clicking the button, a new set of filtering options is revealed. The following search criteria will become available:

- The **Flash Size (kB)** field allows MCU filtering based on available flash memory. There are two textboxes used to define the minimum and the maximum value for the range. MCUs with the flash memory capacity outside of the Flash Size range will be hidden from the search list.

- The **RAM Size (kB)** field works similarly to the Flash Size field, but it performs filtering based on the amount of the available RAM range of the MCU. MCUs with the RAM capacity outside of the RAM Size range will be hidden from the search list.

The MCU list displayed in the Target Browse window can be sorted in ascending or descending order for each MCU parameter, by clicking on its column header.

- Apply filter button will perform the search action, according to the selected filtering criteria.

- Clear filter button clears all the filtering parameters.

The target MCU can be selected by double clicking on the appropriate line.
Dark or Light...  

...it’s your choice!
5.2 CODEGRIP

The CODEGRIP Menu button contains Menu items related to the detection and setup of the CODEGRIP device.

5.2.1 Scanning

The Scanning Menu item contains tools for detecting CODEGRIP devices. This Menu item also provides controls for link management. There are two tabs displayed in the Menu item section, Scan List tab and Options tab.

Scan List tab

To start the scanning process click on the SCAN DEVICES button. All detected CODEGRIP devices will be visible in the Scan List. Every item listed, displays some general information about the device itself, such as the Device Name, Serial number, and IP address.

Depending on the available interface (USB or WiFi), one or two link buttons will appear on each CODEGRIP device item. These buttons are used to create or close the link between the specific device and CODEGRIP Suite.

Device Name

Every CODEGRIP device has its own device name. This allows the user to clearly identify the specific CODEGRIP device, especially when there is more than one device connected to a host PC. The user can modify the device name.

Serial number

This is a unique serial number associated with the CODEGRIP device. Every device has its own serial number, which is used for the identification. This information cannot be modified by the user.

IP address

If the CODEGRIP device is detected over the WiFi network, its IP address will be displayed. Otherwise, this field will display the message "None".

USB LINK button

This button is used to create or destroy the USB link to a specific CODEGRIP device.
**WiFi LINK button**

This button is used to create or destroy the WiFi link.

Note that the CODEGRIP device must be properly configured and discoverable over the WiFi network for this option to work (more information can be found in the *Configuration Menu item* description, in this chapter).

**SCAN DEVICES button**

This button will start the scanning process. CODEGRIP Suite will try to detect all the CODEGRIP devices visible through USB/WiFi interfaces.

**Options tab**

This tab is divided into two subsections, labeled as *Scan Interface* and *Remote Scan*. Settings which are used to limit the scanning scope, are located in the *Scan Interface subsection*, while the *Remote Scan subsection* contains settings that can be used to expand the scanning to CODEGRIP devices located behind the gateway at a remote location. Up to five IP addresses can be specified in the corresponding fields.

**Selected Interface**

Options: *USB and WiFi, USB only, WiFi only*

This option allows limiting the scanning scope to only CODEGRIP devices which use the interface selected in this dropdown menu.

**Remote Scan Status**

Options: *Enabled, Disabled*

If the *Enabled* option is selected, the IP address from the *Remote Address* fields will be included in the device scan process. Otherwise, only the local network will be scanned.

**Remote Address**

The IP address of CODEGRIP devices located outside of local network can be specified here. CODEGRIP Suite will include this address to send scan packets, looking for available CODEGRIP devices. Note that when the *Remote Scan* is disabled, these fields will become unavailable.

For communication over WiFi interface CODEGRIP runs the following:

- TCP and UDP servers on port 49001
- TCP server on port 49002

**NOTE**

**WiFi LINK button**

This button is used to create or destroy the WiFi link.

Note that the CODEGRIP device must be properly configured and discoverable over the WiFi network for this option to work (more information can be found in the *Configuration Menu item* description, in this chapter).

**SCAN DEVICES button**

This button will start the scanning process. CODEGRIP Suite will try to detect all the CODEGRIP devices visible through USB/WiFi interfaces.

**Options tab**

This tab is divided into two subsections, labeled as *Scan Interface* and *Remote Scan*. Settings which are used to limit the scanning scope, are located in the *Scan Interface subsection*, while the *Remote Scan subsection* contains settings that can be used to expand the scanning to CODEGRIP devices located behind the gateway at a remote location. Up to five IP addresses can be specified in the corresponding fields.

**Selected Interface**

Options: *USB and WiFi, USB only, WiFi only*

This option allows limiting the scanning scope to only CODEGRIP devices which use the interface selected in this dropdown menu.

**Remote Scan Status**

Options: *Enabled, Disabled*

If the *Enabled* option is selected, the IP address from the *Remote Address* fields will be included in the device scan process. Otherwise, only the local network will be scanned.

**Remote Address**

The IP address of CODEGRIP devices located outside of local network can be specified here. CODEGRIP Suite will include this address to send scan packets, looking for available CODEGRIP devices. Note that when the *Remote Scan* is disabled, these fields will become unavailable.

For communication over WiFi interface CODEGRIP runs the following:

- TCP and UDP servers on port 49001
- TCP server on port 49002

**NOTE**
5.2.2 Configuration

When Configuration Menu item is clicked, a set of four tabs will be displayed in the Menu item section Device General, WiFi General, WiFi Mode, and Licenses, each with its own set of options. On the bottom of the Menu item section, there are two buttons:

RELOAD CONFIGURATION button will read back the configuration values from the CODEGRIP device, refreshing the content of CODEGRIP Suite.

STORE CONFIGURATION button will upload the current configuration to the linked CODEGRIP device and perform the reset, applying new configuration settings to the CODEGRIP device.

Device General tab

This tab contains some general information about the linked CODEGRIP device.

Device Name

The name of the currently linked CODEGRIP device can be set here, allowing it to be easily identified by the user. It can consist of up to 32 printable ASCII characters.

Manufacturer Name

This field displays the name of the manufacturer [MikroElektronika]. This field is programmed during the production phase and cannot be changed.

Serial Number

This field contains a unique serial number, associated with the specific CODEGRIP device. This field is programmed during the production phase and cannot be changed.

Hardware version

Hardware version number represents the hardware revision of the CODEGRIP device. This field is programmed during the production phase and cannot be changed.

Firmware version

Firmware version number represents the current firmware revision of the linked CODEGRIP device.
Licenses tab

The Licenses tab displays a summary of CODEGRIP licenses. The Activated Licenses subsection contains licenses that have been activated and are in use. The Available Licenses subsection displays all licenses currently available for purchase. The license activation process itself is explained in the chapter 5.2.3. Licenses can be purchased at the Mikroe store in the same way as any other item:

For WiFi license, please visit [www.mikroe.com/codegrip-wifi-license](http://www.mikroe.com/codegrip-wifi-license)

For SSL security license, please visit [www.mikroe.com/codegrip-ssl-license](http://www.mikroe.com/codegrip-ssl-license)
**WiFi General tab**

This tab contains general WiFi information about the linked CODEGRIP device.

**Interface State**

Options: *Enabled, Disabled*

The integrated WiFi module can be enabled or disabled by selecting an option from this dropdown menu. The *Enabled* option will enable the integrated WiFi module, allowing it to be used. The *Disabled* option will disable the integrated WiFi module, by shutting it down completely. This option is useful when reduced power consumption is required.

**Antenna**

Options: *External, Internal*

The type of WiFi antenna can be selected from this dropdown menu. An external antenna might provide better connection quality, while the internal multilayer chip antenna can be superior in terms of simplified setup when operated over a short distance.

The external antenna can be attached at the provided SMA connector.

**WiFi Mode**

Options: *Station Mode, AP Mode*

This dropdown menu allows selection of the operating mode for the integrated WiFi module.

*Station mode* will configure the WiFi module to work as a wireless station. The station mode is used to wirelessly connect to an existing access point.

*AP Mode* will configure the WiFi module to work as an access point. The *AP Mode* allows the host PC to establish a direct WiFi connection with the CODEGRIP device.

**NOTE**

If selected Antenna option does not match hardware setup (i.e. the Antenna option is set to “External”, but no external antenna is actually attached) signal strength might be significantly degraded.
**TX Power**

Options: 0 to 15  
This dropdown menu allows the strength of WiFi signal transmission power to be adjusted. Note that the selected value represents the signal attenuation, meaning that the value 0 will result with no signal attenuation while selecting the value 15 will result with the maximum signal attenuation.

**SSL**

Options: Disabled, Enabled  
This dropdown menu allows to set up the encryption method for the WiFi network traffic.

**NOTE**  
WiFi and SSL licenses are bought separately, from the Mikroe online store.

**Scannable:**

Options: Disabled, Enabled  
Define if the device is visible on scan proc.

**Link Password**

CODEGRIP runs two TCP servers for communicating over WiFi interface:

- Config server on port 49001 - used for setup configuration of the device  
- Debug server on port 49002 - used for communication with target MCU

Communication with each server can be authenticated using the corresponding link password. If the option is enabled, CODEGRIP the device will require a password in each exchanged packet.

**NOTE**  
Once entered, the password for the specific CODEGRIP device is stored by the CODEGRIP Suite, so that the user does not have to enter the password each time the CODEGRIP device is used.

**Filter MAC Address**

The CODEGRIP device allows the connection to be established only with the host PC whose MAC address corresponds to the MAC address entered in this field.

The MAC filtering option can be completely disabled by unchecking the checkbox next to the Filter MAC Address field.

**Signal Level (dBm)**

This field displays the strength of the WiFi network signal in dBm. Values around -60dBm are considered as good and reliable signal reception, while values less than -80dBm will probably result in lost packets.
**WiFi Mode tab**

This tab contains some specific WiFi settings for each of the two available modes of operation. There are two subsections labeled as Access Point Mode and Station Mode. WiFi settings are grouped into these subsections, according to the mode they are used for.

**Access Point Mode subsection**

**SSID**

This is the wireless network identifier, up to 32 characters long.

**Password**

The network password can be set in this field. If the security protocol is not set to Open, the WiFi client is required to provide a password that matches the string in this field.

**Secure type**

Options: Open, WEP, WPA/WPA2

The Security protocol of the wireless network can be selected from this dropdown menu.

**Country Code**

Options: EU, USA

This option is used to set Tx signal levels and available frequency channels for the selected region (EU: 1 - 13, USA: 1 - 11).

If used outside of these regions, please set up the WiFi signal parameters manually (Channel and Tx level), according to your local radio-frequency regulations.

**Channel**

Options: 1 to 13

This option is used to select the WiFi radio-frequency band, in relation with the Country Code settings.

---

When used in the Access Point (AP) mode, the CODEGRIP device will have a fixed IP address (192.168.1.1), with the DHCP protocol enabled.
**Station Mode subsection**

All configuration settings related to the Station Mode are shown in this subsection. When operated in the Station mode, the CODEGRIP device becomes the WiFi client.

**SSID**

This is the network identifier. The string in this field must match the SSID string of the network to which the connection is attempted.

**Password**

If the WiFi network to which the connection is attempted requires a password, it can be specified in this field.

**Secure type**

Options: Open, WEP, WPA/WPA2

The security protocol selected here must match the security protocol used on a WiFi network to which the connection is attempted.

**IP Settings**

Options: Use following static IP addresses, Obtain IP address automatically

*Use following static IP addresses* allows the user to manually enter static IP address settings for the WiFi network.

*Obtain IP address automatically* provides the network settings, assuming that the DHCP server is running on the local network. The next four settings will not be editable if this option is selected.

**IP Address**

The IP address of the CODEGRIP device can be set here. Care should be taken not to have two devices with the same IP on the same WiFi network.

**Subnet mask**

Network subnet mask can be set in this field.

**Gateway**

This field is used to set the IP address of the default gateway device.

**DNS**

This field is used to set the IP address of the network DNS server.
5.2.3 License

License Menu item offers a set of options that are used to activate a license and enter user information, allowing personalization of the CODEGRIP device. When the License Menu item is clicked, the Menu item section displays two subsections. The subsection labeled as User information contains text boxes which allow some general user information to be entered, including a user name, email, company, and so on. The subsection labeled as Registration codes offers some tools used to add a new license key and activate it.

User Information subsection

Name

A user name can be entered in this field.

Email

An email address can be entered in this field. Only a valid email address format is accepted.

Repeat Email

This field is used to confirm that the email address was entered correctly. The content of this field should match the content of the Email field.

Company

The name of the company can be entered in this field. This may be the name of the company that owns the license or the name of the company that hired the person to whom the license was issued.

I’m

Options: None, Company, Individual
This dropdown menu is used to select one of three offered user categories.

Field of Work

Options: a list that contains various fields of work
The user can choose a field of work that best suits his profile. A list of
various fields of work is contained within this dropdown menu, covering a wide range of different occupations.

**NOTE** If any of these fields contain invalid characters or uses a wrongly formatted input (such as in the case of email address) the ACTIVATE LICENSES button will be disabled. The text field containing an invalid value will display the invalid option/string in red letters.

### Registration Codes subsection

In this subsection, there are buttons used to facilitate the licensing process. The three buttons in the top row are used to enter and manipulate the registration codes, while the last button is used to activate the specified registration codes.

- **button** is used to add a new registration code. Clicking this button opens a new dialog window that allows the registration code to be entered. When a valid code is entered, it can be confirmed and stored by clicking the **OK button**. CODEGRIP Suite offers multiple codes to be added, allowing simultaneous activation of all available features. All stored codes are displayed on the panel below the buttons.

- **button** is used to edit the selected registration code. To select a specific code, it is enough to click on it.

- **button** in the top row is used to delete the selected registration code.

Finally, after the registration codes are successfully stored, clicking on the **ACTIVATE LICENSES** button will perform their verification. If successful, the respective CODEGRIP Suite feature will be activated. Otherwise, an error message will be displayed in a popup window.

Once the licensing process is successfully completed, the licenses will be permanently stored within the CODEGRIP device.

For WiFi license, please visit [www.mikroe.com/codegrip-wifi-license](http://www.mikroe.com/codegrip-wifi-license)

For SSL security license, please visit [www.mikroe.com/codegrip-ssl-license](http://www.mikroe.com/codegrip-ssl-license)

**NOTE** To successfully complete the activation process using the registration code, it is necessary to have the CODEGRIP device linked through the USB interface.
5.3 POWER

5.3.1 Outputs

When the Outputs Menu item is clicked, the Menu item section will be divided into two subsections: Controls and Measurements. The Controls subsection offers a set of options used to control power-related parameters, while the Measurements subsection offers visual feedback of the power-related parameters.

**Board & Target Switch**

Options: 0V to 3.3V
The SET VOLTAGE button opens a dialog window which allows to set up the voltage that will be applied to the target MCU. The voltage can be set from 0 to 3.3V in 0.1V steps. Once set, the voltage can be applied by switching the button next to the SET VOLTAGE textbox.

**Voltage (V)**

This text field is used to display the actual voltage value on the target MCU connector. The CODEGRIP device is not only able to power up the target MCU, but it can also be powered by the target MCU. This field will display the actual value of the voltage on the connector in both cases: when the CODEGRIP device is used to power the target MCU, and when connected host board provides power to the CODEGRIP device.
5.4 OPTIONS

5.4.1 General

The Menu item section is divided into two subsections, labeled as Target and Suite.

Erase Type

Options: Mass Erase will erase the content of the target MCU flash memory.

Verify after Write

Options: Enabled, Disabled
If Enabled, the MCU program memory will be verified after the programming process is complete.

Verification Type

Options: Readback
Verify by Readback compares the content of the program memory with the source .hex or .bin file content.

Check for Updates

Options: Disabled, Enabled
If Enabled, CODEGRIP Suite will check if there is a new version available for download each time it starts.

WiFi Timeout [s]

Options: 1, 3, 5, 10, 20, 30, 60
When using the WiFi interface, CODEGRIP Suite will test the link to the CODEGRIP device before each command. If there is no response from the linked CODEGRIP device within the selected timeout interval, the operation will be canceled, and an error message will be displayed.
5.5 HELP

HELP Menu button reveals two Menu items when clicked: About and Updates. These Menu items contain some general information about the CODEGRIP, along with the CODEGRIP Suite update and firmware update tools.

5.5.1 About

By clicking on About Menu item, some general information that covers the current version of the release, the development team, and links to the site and email address will be displayed in the Menu item section.

Besides the general information, there is also a small book icon that opens the HELP within the application.
5.5.2 Updates

This Menu item contains tools used to update the Suite itself, as well as the firmware of the CODEGRIP device. There are three tabs on the Menu item section when this Menu item is clicked: the Suite tab, the CODEGRIP tab, and the Power Module tab.

Suite tab

When this tab is selected, a short message is displayed on the Menu item section, describing how to check for CODEGRIP Suite updates. If the CHECK FOR UPDATES button on the bottom is clicked, CODEGRIP Suite will check if there is a more recent version available. A new window will pop up, displaying whether the CODEGRIP Suite is up to date, or there is a new version available.

In the case when there is a new version available, a question message will be displayed on the window, asking the user to confirm or cancel the update procedure.

CODEGRIP tab

This tab contains a message panel which offers information about the currently available firmware version, followed by a short instruction on how to detect the CODEGRIP device in a bootloader mode.

Power Module tab

There are some options in this tab, currently not supported by CODEGRIP Suite. This option is reserved for future updates.
6. Troubleshooting

6.1 Target programming errors

<table>
<thead>
<tr>
<th>Error Messages</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target is not detected (DETECT)</td>
<td>Make sure that the selected MCU matches the MCU connected to the CODEGRIP device.</td>
</tr>
<tr>
<td>Connecting to target failed</td>
<td>Check that the selected interface matches the program lines on the board.</td>
</tr>
<tr>
<td></td>
<td>Try to communicate at a lower speed.</td>
</tr>
<tr>
<td>Selected chip not recognized (All buttons except DETECT)</td>
<td>Make sure that the selected MCU matches the MCU connected to the CODEGRIP device.</td>
</tr>
<tr>
<td>File not verified</td>
<td>The content in the MCU flash differs from the contents of the source file.</td>
</tr>
<tr>
<td></td>
<td>Make sure the MCU is not read-protected.</td>
</tr>
<tr>
<td>Operation failed (VERIFY, READ)</td>
<td>Check the communication with the CODEGRIP device and the connection</td>
</tr>
<tr>
<td></td>
<td>between the CODEGRIP device and the MCU.</td>
</tr>
<tr>
<td>Disconnect from target failed</td>
<td>CODEGRIP Suite lost the connection to the CODEGRIP device before the operation was completed.</td>
</tr>
<tr>
<td>Interface to target currently being used</td>
<td>Make sure there is no Debug process in progress.</td>
</tr>
<tr>
<td>Your board doesn’t support selected vendor</td>
<td>Make sure your MCU card is compatible with the development board.</td>
</tr>
<tr>
<td>Error Messages</td>
<td>Troubleshooting</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Unknown registration code</td>
<td>Make sure you have entered correct Registration Code.</td>
</tr>
<tr>
<td>Registration code already approved</td>
<td>Registration code previously used for activation. Please make sure you haven’t already activated CODEGRIP device with this Registration Code. Check Licenses tab in Configuration Menu Item (make sure you reloaded configuration). You can use it to license only one device.</td>
</tr>
<tr>
<td>License exists</td>
<td>CODEGRIP device has already been licensed for feature corresponding to Registration Code.</td>
</tr>
<tr>
<td>Device doesn’t support license</td>
<td>You may have purchased the Registration Code that is not suitable for your device. Please contact our support.</td>
</tr>
</tbody>
</table>
Time-saving embedded tools
**DISCLAIMER**

All the products owned by MikroElektronika are protected by copyright law and international copyright treaty. Therefore, this manual is to be treated as any other copyright material. No part of this manual, including product and software described herein, must be reproduced, stored in a retrieval system, translated or transmitted in any form or by any means, without the prior written permission of MikroElektronika. The manual PDF edition can be printed for private or local use, but not for distribution. Any modification of this manual is prohibited.

MikroElektronika provides this manual ‘as is’ without warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties or conditions of merchantability or fitness for a particular purpose.

MikroElektronika shall assume no responsibility or liability for any errors, omissions and inaccuracies that may appear in this manual. In no event shall MikroElektronika, its directors, officers, employees or distributors be liable for any indirect, specific, incidental or consequential damages (including damages for loss of business profits and business information, business interruption or any other pecuniary loss) arising out of the use of this manual or product, even if MikroElektronika has been advised of the possibility of such damages. MikroElektronika reserves the right to change information contained in this manual at any time without prior notice, if necessary.

**HIGH RISK ACTIVITIES**

The products of MikroElektronika are not fault – tolerant nor designed, manufactured or intended for use or resale as on – line control equipment in hazardous environments requiring fail – safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines or weapons systems in which the failure of Software could lead directly to death, personal injury or severe physical or environmental damage (‘High Risk Activities’). MikroElektronika and its suppliers specifically disclaim any expressed or implied warranty of fitness for High Risk Activities.

**TRADEMARKS**

The MikroElektronika name and logo, mikroC, mikroBasic, mikroPascal, CODEGRIP, mikromedia, Click boards™ and mikroBUS™ are trademarks of MikroElektronika. All other trademarks mentioned herein are property of their respective companies.

All other product and corporate names appearing in this manual may or may not be registered trademarks or copyrights of their respective companies, and are only used for identification or explanation and to the owners’ benefit, with no intent to infringe.

Copyright © MikroElektronika, 2022, All Rights Reserved.
If you want to learn more about our products, please visit our website at www.mikroe.com.
If you are experiencing some problems with any of our products or just need additional information, please place your ticket at www.mikroe.com/support.
If you have any questions, comments or business proposals, do not hesitate to contact us at office@mikroe.com.