

PLANET



DEBUG

USER MANUAL

# PC INDEPENDENT HARDWARE EMBEDDED REMOTE PROGRAMMING / DEBUGGING **WITH LIVE STREAMING**

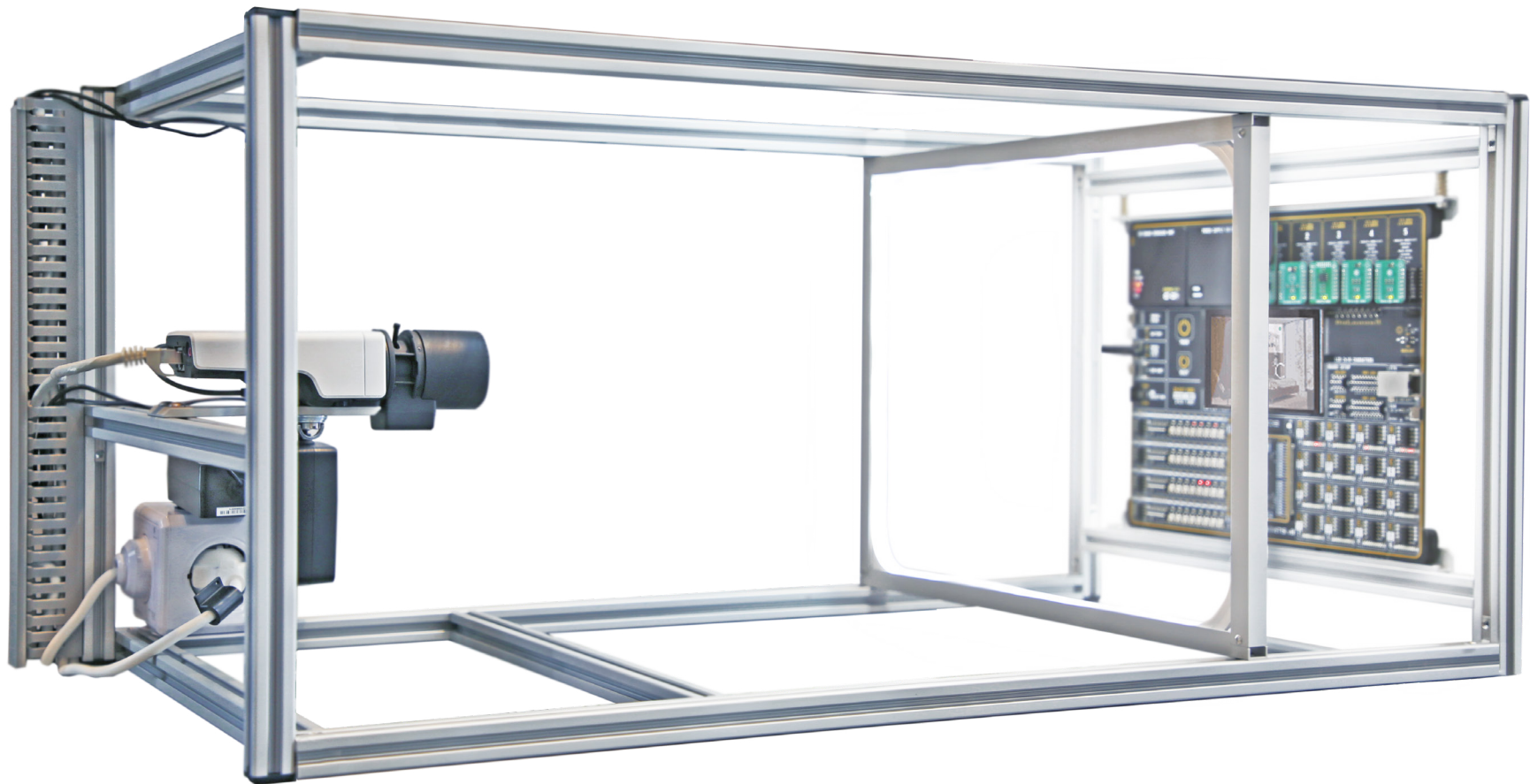


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This document should give you an insight into what is needed for one Planet Debug Setup to be installed and connected to the Internet on the Client location. The document covers physical requirements [space] required for the metal frame to be installed,

network parameters, and settings that need to be provided/set on the hardware, as well as on the MIKROE licensing portal.



# INSTALLATION REQUIREMENTS

For Planet Debug to be installed in a specific location, the following conditions must be met on the Client [physical host and connection provider] side:

## **Business requirements:**

- Setup must be turned ON 24/7
- Internet connection must be consistent and present at all times
- Setup is not exclusive for the setup holder [unless agreed differently]

## **Physical requirements (per setup):**

- One Planet Debug setup requires 90cm x 37cm x 42cm [35.43"x16.54"x16.54"]
- Power wall connection to 220/110V
- LAN Internet Connection [for AP/Switch]

## **Network requirements:**

To enable communication with setup devices [development board and camera], a client needs to:

- Provide information about Public IP
- Enable port forwarding [NAT] through 4 ports

# SETUP ASSEMBLY

*What's in the package - Planet Debug*



## Assembly steps

### **Step 1:** Metal Frame Base

The Planet Debug metal frame cell consists of elements that are combined in precise order. You will get all the necessities in a package that holds all the parts in place.

In order to assemble your own frame, you need to follow the detailed instructions provided to you.



**NOTE** Assembly instructions can be found inside the packaging

Figure 2: Photo of the included metal frame

### **Step 2:** Mounting necessities

Connect 12V power adapter to the 12VDC input of the development board.

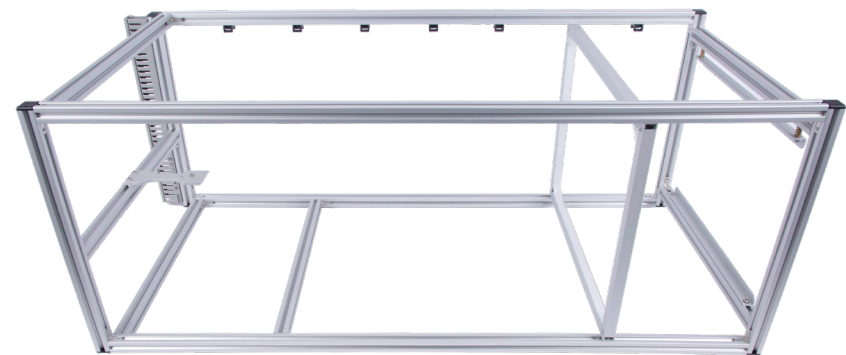


Figure 3: Photo of assembled frame using the provided instructions



Connect 12V power adapter to the 12VDC input of the development board, but also pay attention to the cable management and place it in the appropriate guides so that it does not interfere with the position of the camera.

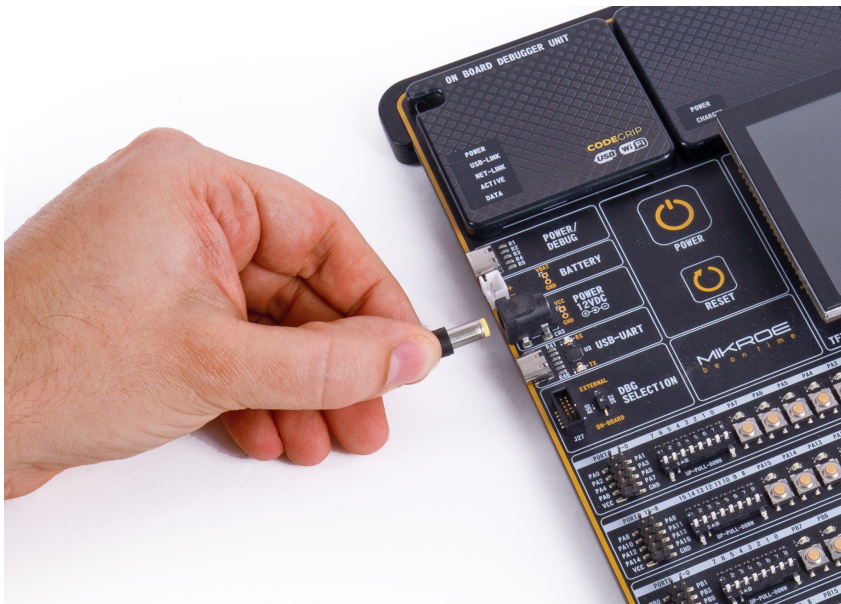


Figure 4: Connecting 12V power plug to the board

Position the plate first in the part where the fenders are and then gently push it in place and it will be locked to. The final adjustment should be made at the end when you have a video stream.



Figure 5: Placing development board into the metal base



### Step 3: Lighting

An essential element of the video stream is good lightning. Place the light strips inside the metal frame base, located in front of the board mounting section.

After successful mounting, connect the 12V power adapter to the LED lights power chord.



Figure 6: Connecting 12V power plug to the LED connector

### Step 4: IP Camera placement

To fix the Axis M1137 IP camera onto the metal frame, we will only use the only screw inside the package box instead of using the holder. Connect ETH cable to the camera.

Place the IP camera into the frame base and screw it from the bottom side.



Figure 7: Connecting the IP camera

## Step 5: Network equipment

For internet connection we will use one WiFi Access Point (AP) and one PoE switch for Ethernet connection of AP and IP camera, as well as for powering the PoE camera itself.

WiFi Access Point role is to provide WiFi connectivity for the development board if there is no WiFi network present. To make it functional you just need to connect 1.0m Ethernet cable to the Access Point and plug it into the wall outlet.

PoE Switch should be placed on the metal frame base (yellow side) under the camera, on a dedicated place for it.

## Step 6: Powering

As a final step, you need to insert a development board 12VDC adapter, light 12VDC adapter, PoE switch adapter, and WiFi AP to the extension cord before connecting it to the wall. With this setup, MIKROE will provide an extension cord along with a US wall adapter if needed.

After successful mounting PoE Switch onto the frame, you should connect:

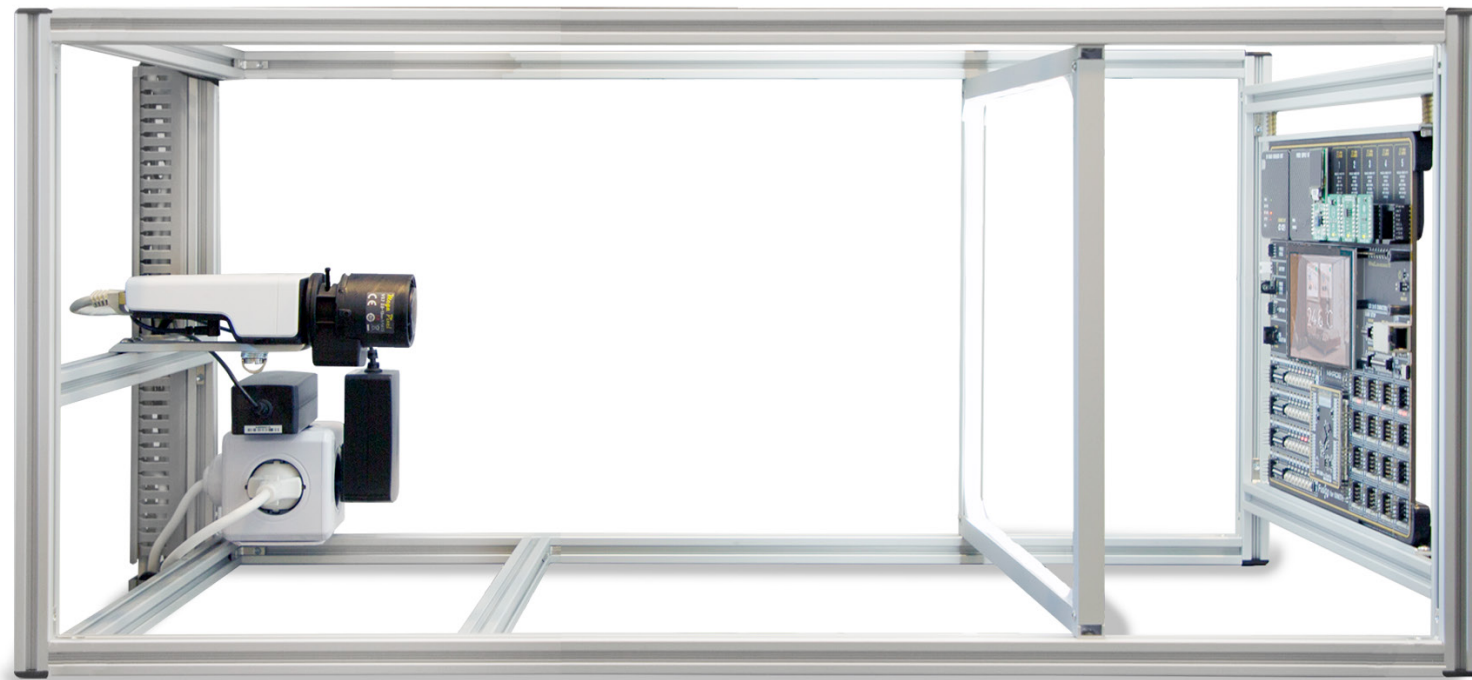
**IP camera** – with 1x0.5m Ethernet cable Cat 6 S/FTP to one of the 4 available ports [positions 1,2,3,4].

**Access Point** – with 1x1.0m Ethernet cable Cat 6 S/FTP to one of the 4 available ports [positions 1,2,3,4].

**UPLINK** – Additional 1x3.0m Ethernet cable goes from the Switch uplink port to your network.

**Connect DC power wall adapter 51.0V – 1.25A 63.75W** to the switch.





*Fully assembled Planet Debug frame*

# NETWORK CONFIGURATION

To establish a network connection for development board and IP camera, you will need devices PoE Switch and Access Point connected. They are included in the package, PoE Switch Tenda TEF1106P-4-63W, and Tenda A301 WiFi.

## PoE Switch

Device Tenda TEF1106P-4-63W is an unmanaged PoE switch. Configuration is not needed; just plug IP camera and Access Point to ports 1-4. UPLINK port plug to your LAN.

## Access point

The development board has a network connection over the WiFi. To establish the connection, we are providing the device Tenda A301 WiFi, and you will need to make the initial setup as AP [Access Point] mode. To do this, you can use the Manual from the box or by URL:

<https://www.tendacn.com/en/download/detail-3120.html>

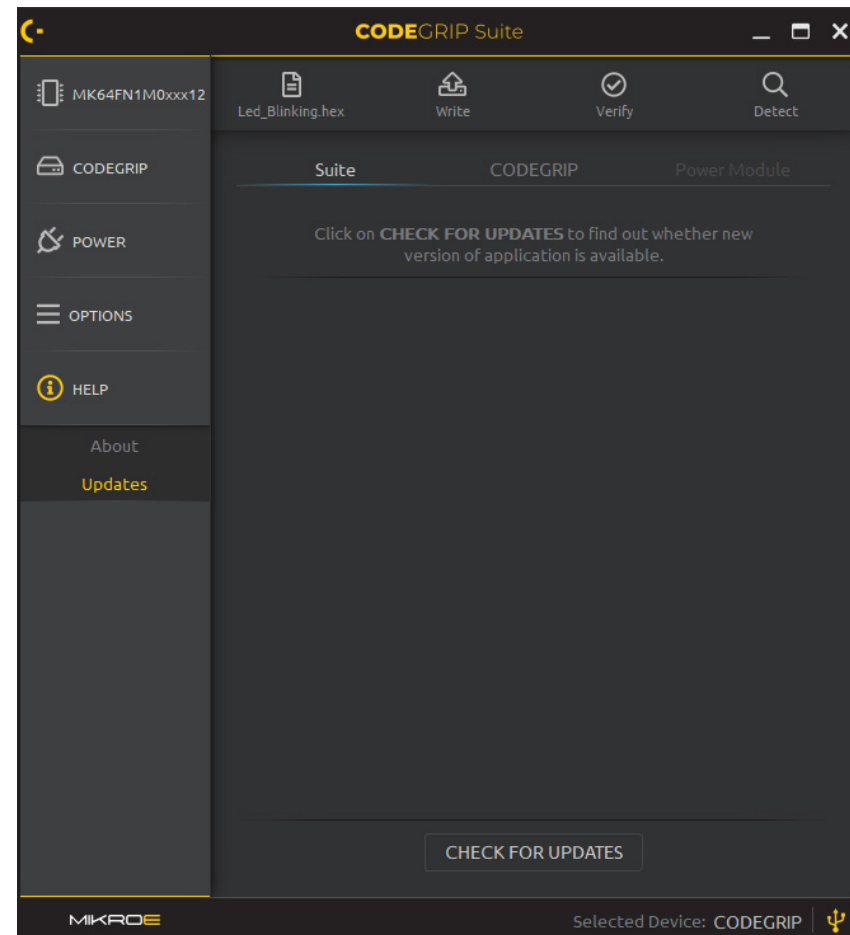
# CODEGRIP CONFIGURATION

## Install CODEGRIP suite

To use and access the development board from the NECTO Studio IDE through the WiFi, you will need to enable WiFi and SSL licenses. Download the CODEGRIP Suite application from the link <https://www.mikroe.com/setup/codegrip> and follow installation steps.

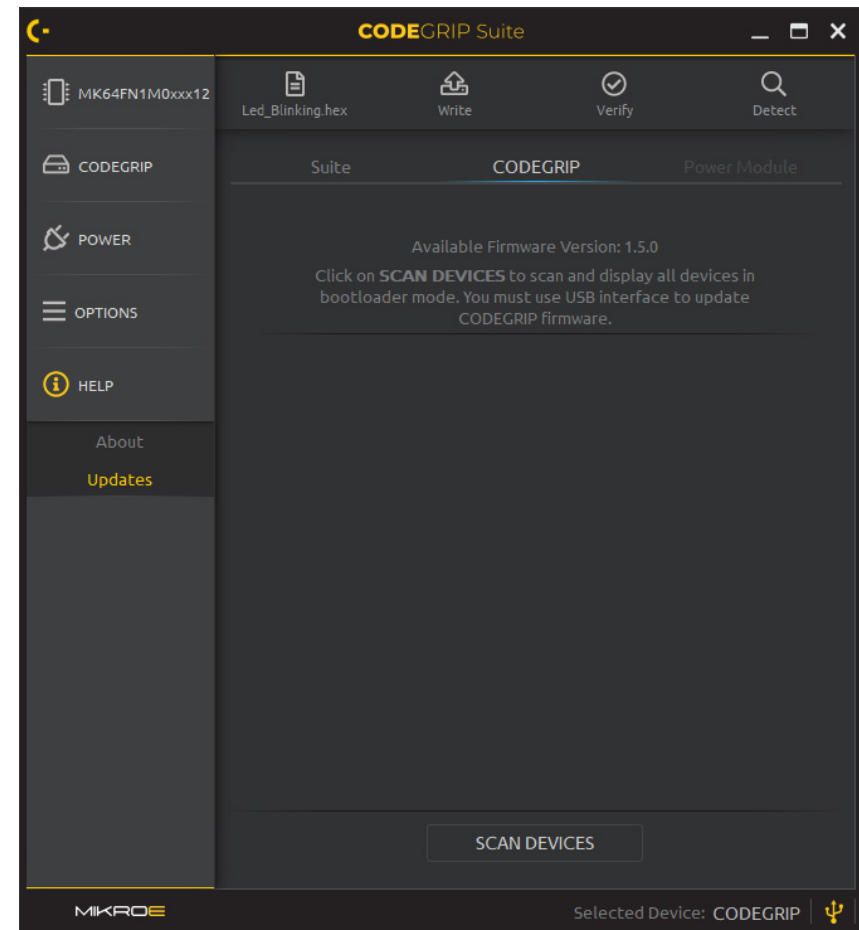
## Check for updates

1. Run the CODEGRIP Suite application and open the Updates Menu item under the HELP Menu button.
2. Under the Suite tab, click on the CHECK FOR UPDATES button to check if a more recent version of the application is available.
3. In the case when there is a new version available, confirm the update procedure.



## Check for CODEGRIP updates

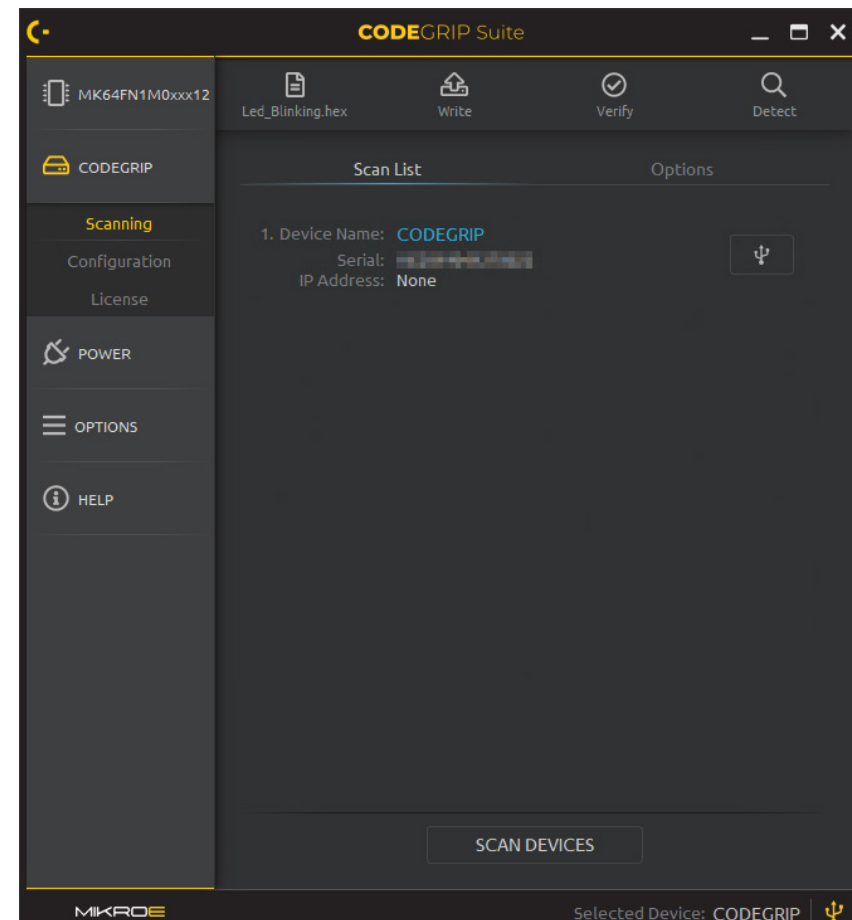
1. Connect the CODEGRIP with a PC using the USB-C cable. If everything was connected properly, POWER, ACTIVE and USB LINK LED indicators on the CODEGRIP device should be ON.
2. Under CODEGRIP tab follow instruction on how to detect CODEGRIP device in a bootloader mode.
3. Power cycle CODEGRIP module and click SCAN DEVICES button.
4. If there is a newer version of firmware available confirm the update procedure.



## Select CODEGRIP device

1. Open the CODEGRIP menu button and select the newly unfolded Scanning menu item.
2. Click on the SCAN DEVICES button to get a list of available CODEGRIP devices.
3. To connect with your CODEGRIP over a USB cable, click the USB Link button.

If more than one CODEGRIP is available, identify yours by its serial number printed on the bottom side.





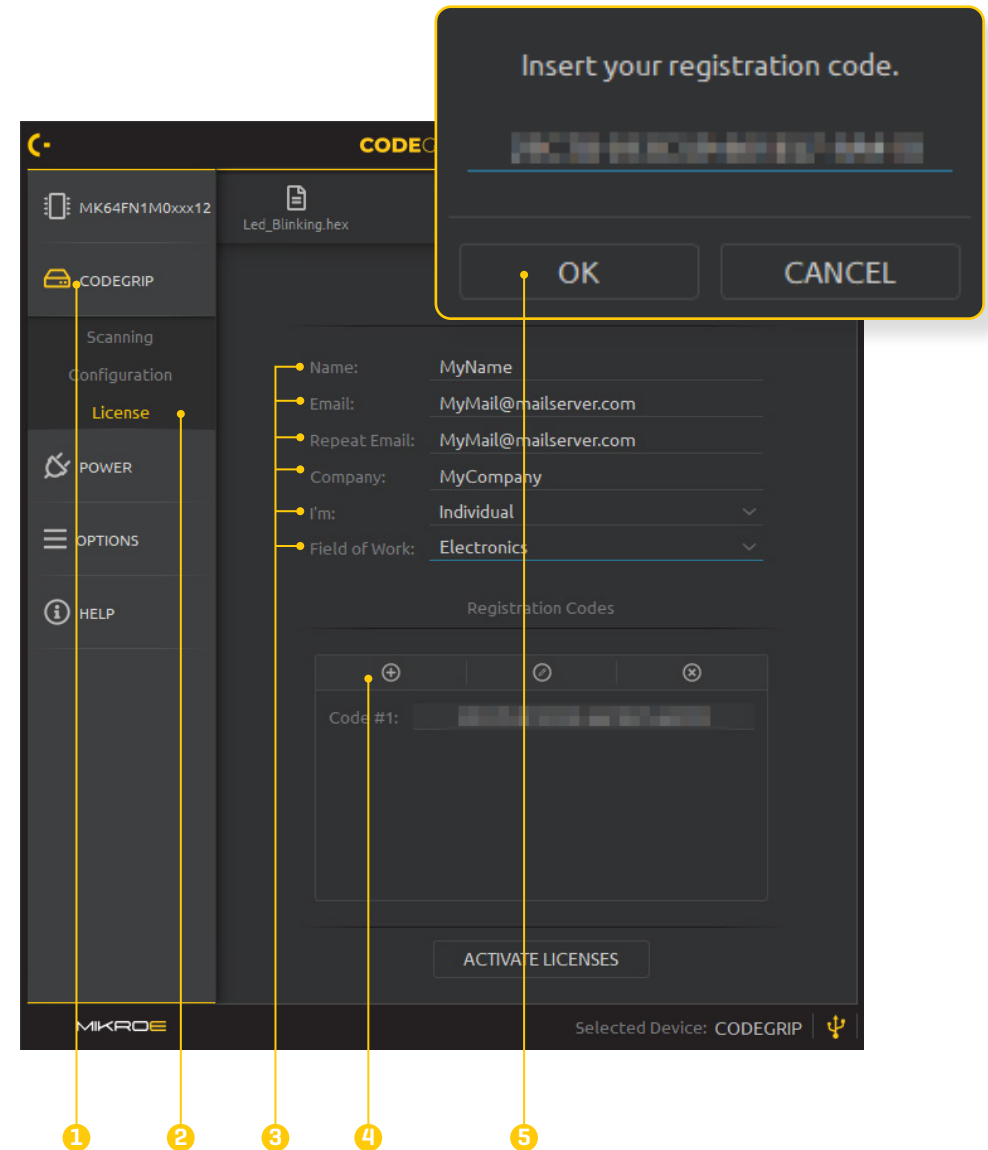
## Activate licenses

Some features of the CODEGRIP such as the functionality of the WiFi module, and the SSL security, require licensing. If no valid license is found, these options will be unavailable in the CODEGRIP Suite.

Open the *CODEGRIP* menu [1] and select the newly unfolded *License* menu item [2].

Fill in the user registration information [3]. All fields are mandatory in order to proceed with the licensing process.

Click on the ⊕ button [4] and a dialog window will pop up. Enter your registration code in the text field [5] and click the OK button. The entered registration code will appear in the *Registration Codes* subsection.

**NOTE**

Please have in mind that for successful license activation internet connection is required.

After a valid registration code[s] is added, click on the *ACTIVATE LICENSES* button [6]. A confirmation window will appear, suggesting that you should reload the CODEGRIP configuration. Click the OK button to close this window.

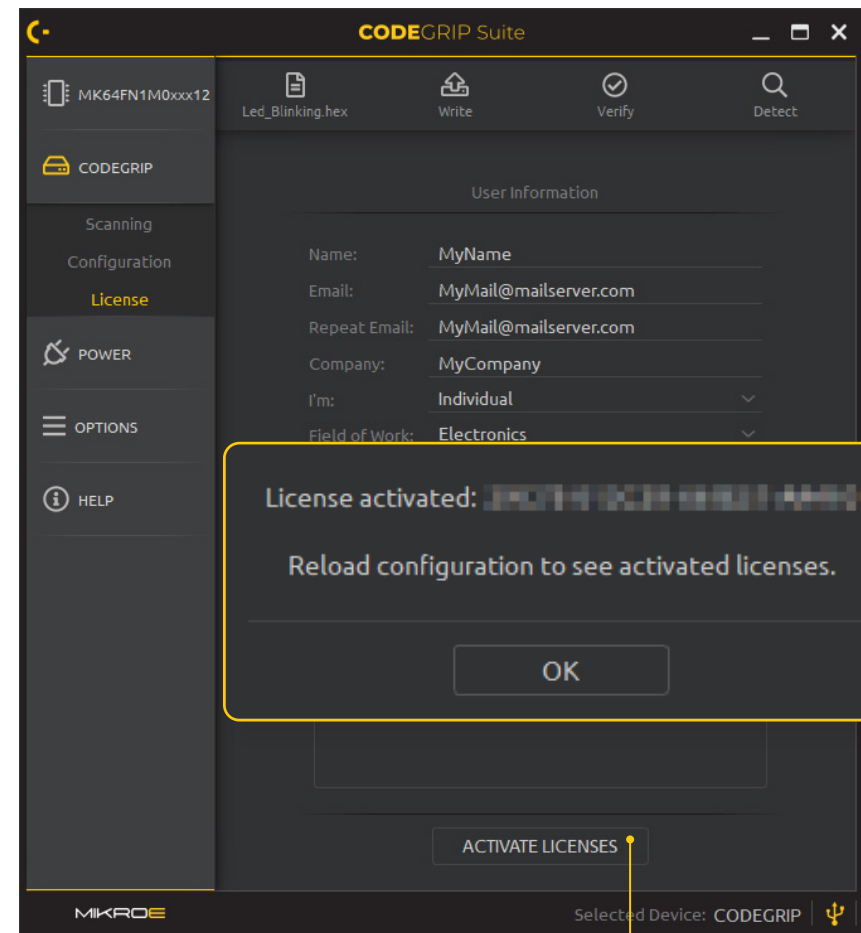
Once the licensing process is successfully completed, the licenses will be permanently stored within the CODEGRIP device.

For WiFi license, please visit

[www.mikroe.com/codegrip-wifi-license](http://www.mikroe.com/codegrip-wifi-license)

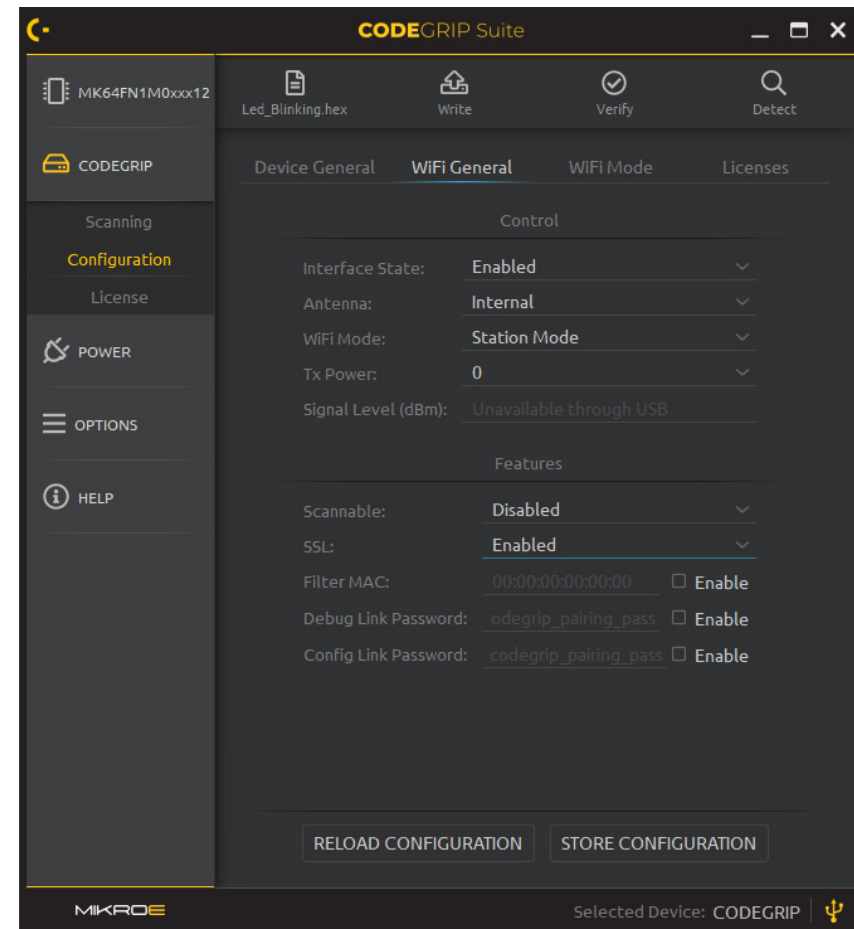
For SSL security license, please visit

[www.mikroe.com/codegrip-ssl-license](http://www.mikroe.com/codegrip-ssl-license)



## Configure WiFi general options

1. Open the CODEGRIP Menu button and select the newly unfolded Configuration Menu item.
2. Open tab WiFi General and set configuration as shown in the image below.



## Configure WiFi mode options

Open tab WiFi Mode and fill in the fields under the Station Mode section:

### SSID

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

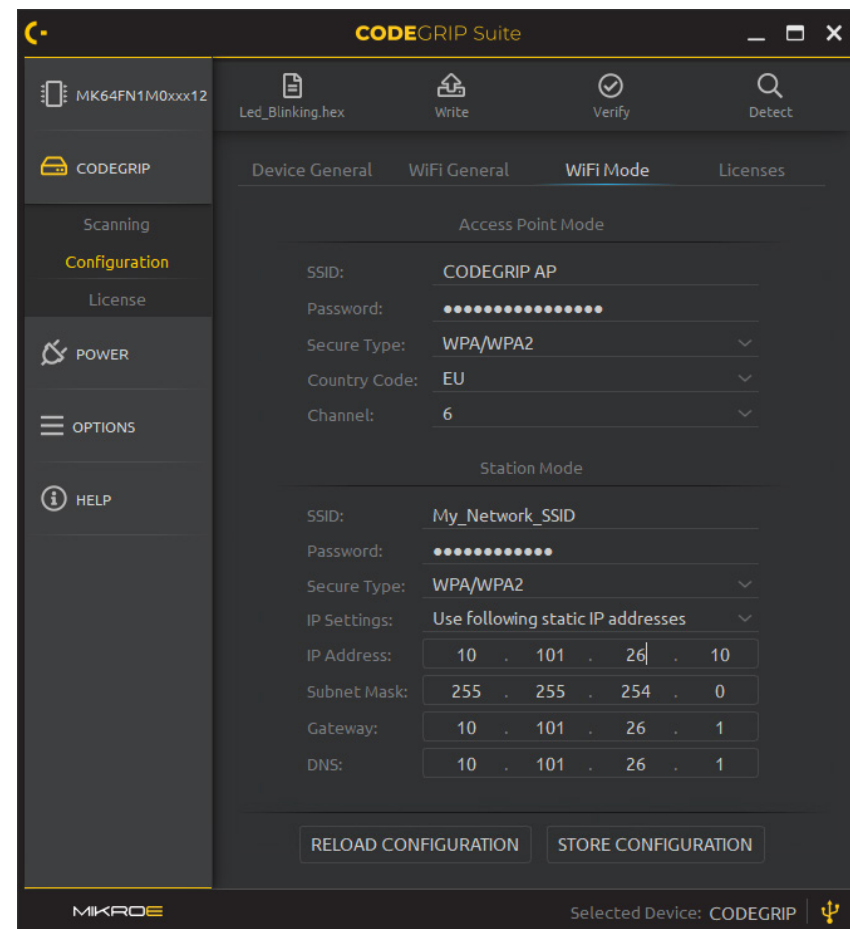
**Secure type:** The security protocol selected here must match the security protocol used on a WiFi network to which the connection is attempted.

**IP Settings:** Select option Use following static IP addresses. Allows the user to enter static IP address settings for the WiFi network manually.

**IP Address, Subnet mask, Gateway, DNS:** The IP address of the CODEGRIP device should be set here.

## Store selected configuration

Once the appropriate options are filled, save them in the device using the STORE CONFIGURATION button. Device will be restarted after configuration storing is finished.



# CAMERA CONFIGURATION

## Installation

After mount, connect the IP camera to PoE Switch [ports 1-4] if you haven't done so already. Greenlight is the sign of a connected and



As you can see above, there's one device available. Be aware, the Axis device [IP camera] and program [Axis IP Utility] must be on the same network subnet. If not, use another IP Utility that is supported by scanning other subnets. You have several options like **assign network parameters**, **change IP address only**, and **accessing the device through the web page**. First of all, you need to put a static IP address because it will be needed for Port Forwarding on your router.

## Setup

Before you access the camera, you will need to install AXIS IP Utility from this link:

<https://www.axis.com/support/downloads/axis-ip-utility>

## Assign the IP address

1. Start the AXIS IP Utility
2. The device will show up. Select, right-click on it and choose **Assign IP address**
3. Put the **static** IP address and click **Assign**

## Configuration

Now you can access the IP camera. You can do it by putting the IP address directly in the web browser or by AXIS IP Utility [**double-click** or **right-click on a device - View Home Page**].

Initial configuration:

**1.** Set up the root **password**

\*optional - you can **uncheck** below **Share data** with developers

**2.** Choose Power Line Frequency

- a. Europe - 50 Hz
- b. USA - 60 Hz

**3.** Orientation - set to **180** degrees from the drop-down Menu

## Settings

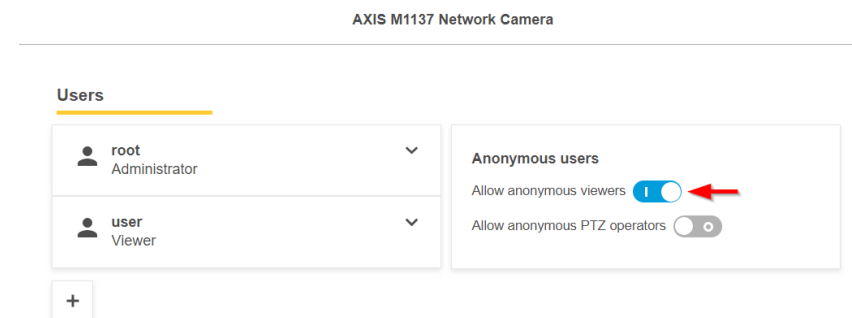
**Important** - Before you proceed, it's necessary to allow anonymous access to the IP Camera

**1.** From the bottom menu, on the right side, click **Settings**

**2.** Select **Users** and then check to **Allow anonymous viewers field** [check the image below]

\* This setting is applied to allow access to the NECTO Studio IDE

\* Afterward, you need to log in if you want to use settings. You can do it by clicking on the user icon [upper right corner] and then Log in.



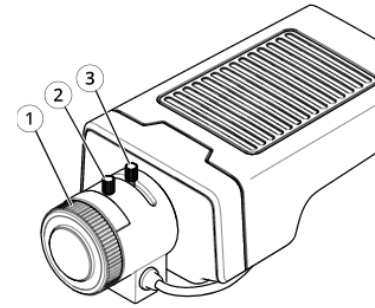
## Camera adjustment

To make a development board visible, you would need to adjust focus and zoom. Follow these steps:

**1.** *If you didn't*, place the IP camera into the metal frame field and development board to the magnetic field [opposite of the IP camera].

**2. Access the IP camera** to check the position and visibility of the development board. Use another device for this step, such as a laptop/PC/phone to follow the changes on stream.

\*centralize the development board in your camera view



**1. Focus ring**

**2. Focus ring lock**

**3. Zoom puller**

**3. Zoom puller** - loosen a screw and move it to the end in the right direction [T sign, stands for Telephoto]. Screw up when you finish.

**4. Focus** - loosen screw [2. Focus ring lock] and move [1. Focus ring] until you get the best-detailed image of the development board. Screw up [1. Focus ring lock] when you finish adjustment.





From the bottom menu, on the lower right corner, click settings and set the following:

### IMAGE TAB

Contrast - **55**

Sharpness - **60**

Orientation [if you didn't change on initial configuration] - **180 degrees**

Light environment - **Fixed - fluorescent 1**

Exposure mode - **Flicker-free 50** or **60 Hz** [depends on 2nd step on initial configuration]

Max gain - **42 dB**

Defog - turn **ON**

**STREAM TAB** - set the following:

Resolution - **2048x1536 (4:3)**

Frame rate - **25** or **30 fps** [depends on 2<sup>nd</sup> step on initial configuration]

Europe - 25 fps

USA - 30 fps

Compression - **60**

### AUDIO TAB

Allow audio - **turn OFF**

**TCP/IP** - Skip this step if you set **static IP address** by AXIS IP Utility

1. Put your static LAN IP address, Subnet mask, Default router [gateway], and DNS [you can use google 8.8.8.8 8.8.4.4]

# SETUP TESTING AND CONFIGURATION

After finalizing all points such as assembly, the configuration of CODEGRIP and IP camera, and port and IP configuration of the network, the final step is adding all parameters to the NECTO Studio License Portal and testing them.

Fill this **EXCEL FILE** for the next steps.

## Network IP configuration

To complete your Planet Debug setup, in this case **development board** and **IP camera**, to be accessible from the NECTO Studio IDE, we need you to forward ports from your router/ISP - **port forwarding**. In total, you would need to open 4 ports [1 for IP camera, 3 for board] per setup. Customer needs to provide filled **Device properties** table, as in the example below.

Device properties						
PID	Device Name	Serial Number	Public IP Address	External Ports	Local IP Address	Local Ports
MIKROE-3808	EasyPIC PRO v8	[15 characters]	17.2.2.2	20101 [TCP & UDP]	10.10.10.11	49001 [TCP & UDP]
				20102 [TCP]		49002 [TCP]
	Axis M1137		217.2.2.2	30101 [TCP]	10.10.10.21	80 [TCP]

*Device properties table*

## Development board properties

Besides adding IP addresses and ports to the license portal, MIKROE will need information about development board configuration such as onboard MCU (with crystal oscillator if it is exchangeable) or MCU card, add-on boards and their exact position, display, LCD. Customer needs to provide filled **development boards components** table, as in the example below.

Development boards components		
Socket	Product Name	PID
microcontroller	MCU Card 13 for STM32 STM32L4S5ZI	MIKROE-3876
display connector	TFT Board 5 RESISTIVE	MIKROE-3792
LCD connector	Character LCD 2X16 with blue backlight	MIKROE-55
mikroBUS 1	GSM Click	MIKROE-1234
mikroBUS 2	PROTO Click	MIKROE-2345
mikroBUS 3	OLED C Click	MIKROE-2850
mikroBUS 4	Temp&Hum Click	MIKROE-1534
mikroBUS 5	Relay Click	MIKROE-356

*Development boards components table*

## Setup testing in NECTO Studio IDE

After you have successfully enabled and filled the port forwarding table and development board information, send both excel files (in attachment) to MIKROE for testing and add a new setup to NECTO Studio IDE.

In case you have some additional questions related to setup, reach out to **MIKROE technical support team**.

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